



Mahidol University  
International College

# M U I C GENERAL CATALOG

2 0 1 8 - 2 0 1 9

For Students  
with I.D. 61xxxxx





# MUIC GENERAL CATALOG

2 0 1 8 - 2 0 1 9

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# **GENERAL INFORMATION**

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## VISION

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**MUIC**

will be recognized  
as a

**WORLD-CLASS  
LIBERAL EDUCATION**  
Institution

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## MISSION STATEMENT

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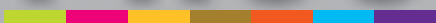
MUIC excels in providing international liberal arts education and selected professional fields in order to prepare global citizens for the 21<sup>st</sup> century and transforming knowledge for the benefit of society through sustainability.

# MODERN COLLEGE IN A HISTORIC UNIVERSITY

Founded in 1889 by His Majesty King Chulalongkorn the Great (Rama V), Mahidol University is one of the oldest educational institutions in Thailand. Over the last one hundred and twenty six years (1889-2015), Mahidol has undergone many changes and advances. Including MUIC (established in 1986), there are now 17 faculties (responsible for both research and teaching), 7 Institutes (focusing mainly on research) and 6 colleges (focusing mainly on teaching). Altogether, the university supports a student body of over 27,000, and over 400 academic programs. With over 3,400 faculty members, the teacher-student ratio is 1:8, the best ratio in any Thai institution of higher education.

Mahidol University International College (MUIC) was founded in 1986 to provide a high standard of international education and to develop a teaching culture that encourages independent and analytical thought and serves students who want an international style university education in English in a four-year program leading to a Bachelor's Degree in Science, the Arts, Business Administration, Engineering and Nursing Science. A modern and forwarding thinking international college, MUIC continues to stress the key elements in university education: learning in math and science; literacy in the English language, literature, philosophy and the arts; and practice in communication skills. Graduates are known for their problem-solving ability and communication skills. Following graduation, the majority of students enters management positions or pursues higher level postgraduate studies both in Thailand and abroad. As part of its international role, MUIC has been involved in many collaborative activities with foreign universities. Visiting professors from overseas have taught many of the courses and have close links with a number of foreign universities and colleges.

# ACADEMIC PROGRAMS





# BUSINESS ADMINISTRATION

Division



# BUSINESS ECONOMICS PROGRAM

## DEGREES OFFERED

**Bachelor of Business Administration**

**(Business Economics)**

**B.B.A. (Business Economics)**

## THE FIELD

The Business Economics Major is based on the economic foundations and developments that have occurred in this subject area over the last several decades. Business Economics major will be well-equipped in both the micro and the macro aspects of economics and their analytical applications to the operational aspects of any business in any particular industry. The curriculum not only provides students with a solid foundation in economics but also prepares them with the tools to better understand the business environment, its market structures and the strategies necessary to compete in a global business world.

## CAREER OPPORTUNITIES

Career choices for Business Economic majors include business analysts and researchers for the Stock Exchange of Thailand, researchers at the Bank of Thailand, positions in the Ministries of Commerce and Finance, in addition to a variety of opportunities in private and public organizations.

## CURRICULUM STRUCTURE

### Business Administration Program

Courses	Credits
General Education Courses	42
Core Business Courses	69
Major Required Courses	20
Major Elective Courses	24
Interdisciplinary Elective Courses	20
Free Elective Courses	8
<b>Total</b>	<b>183</b>

# COURSE LIST

## Foundation Courses

	<b>Non-credit</b>
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

**Note I:** All BBA students are required to take ICID 100 Freshmen Seminar as a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

**Note III:** Students whose Mathematics placement is below ICGN 104 Mathematics and Its Contemporary Applications are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICGN 104 Mathematics and Its Contemporary Applications.

## General Education

**no less than 42 Credits**

### English Communication

**16 Credits**

*\*\* Compulsory Course \*\**

ICGC 103 Public Speaking *	4 (4-0-8)
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ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

**Note I:** All BBA students are required to take either a series of ICGC 101 Academic Writing and Research I and ICGC 102 Academic Writing and Research II or a series of ICGC 111 Academic Writing and Research I (Advanced) and ICGC 112 Academic Writing and Research II (Advanced), depending on their standard test or MUIC entrance exam scores. Students are also required to take ICGC 103 Public Speaking \* as a General Education course in the English Communication course group.

### Natural Sciences

**8 Credits**

*\*\* Compulsory Course \*\**

ICGN 104 Mathematics and Its Contemporary Applications *	4 (4-0-8)
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### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics *	4 (4-0-8)
ICGN 102 Essential Mathematics *	4 (4-0-8)
ICGN 103 Essential Statistics *	4 (4-0-8)

ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

**Note I:** All BBA students are required to take ICGN 104 Mathematics and Its Contemporary Applications \* as a General Education course in the Natural Science course group.

**Note II:** All BBA students are not allowed to take **ICGN 101 Decision Mathematics, ICGN 102 Essential Mathematics, ICGN 103 Essential Statistics and ICGN 114 The Scientific Approach and Society** to fulfill the requirement of Natural Sciences.

**Humanities and Foreign Languages**

**8 Credits**

**Humanities**

• **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

• **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Note I:** All BBA students are required to take at least 1 course from the Humanities course group as a General Education course.

**Foreign Languages**

• **German**

ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)

ICGL 103 Elementary German III	4 (4-0-8)
<b>Japanese</b>	
ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)
<b>French</b>	
ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)
<b>Chinese</b>	
ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)
<b>Spanish</b>	
ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)
<b>Thai</b>	
ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)
<b>Social Sciences</b>	
<b>8 Credits</b>	
<b>●Financial, Economic Scientific and Environmental Literacy</b>	
ICGS 101 Accounting for Young Entrepreneurs **	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change **	4 (4-0-8)
ICGS 103 Economics in Modern Business **	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship **	4 (4-0-8)
ICGS 105 Personal Financial Management **	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101 **	4 (4-0-8)
ICGS 108 Money Matters **	4 (4-0-8)
<b>●Global and Multicultural Literacy</b>	
ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures **	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)
<b>●Psychological Literacy</b>	
ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)



**Note 1:** \*\* All BBA students are not allowed to take ICGS 101, ICGS 102, ICGS 103, ICGS 104, ICGS 105, ICGS 107, ICGS 108, and ICGS 118 to fulfill the requirement of Social Sciences. \*\*

<b>Physical Education</b>	<b>2 Credits</b>
ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

**Core Business courses** **no less than 69 Credits**

**Requirements to start taking BBA courses**

Students are able to take BBA courses only if they have met the following requirements:

1. Passed ICGC 102 Academic Writing and Research II or ICGC 112 Academic Writing and Research II (Advanced) with at least "D" grade
2. Passed ICGN 104 Mathematics and Its Contemporary Applications with at least "D" grade.

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ICMB 201 Business Statistics	4 (4-0-8)
ICMB 205 Microeconomics	4 (4-0-8)
ICMB 206 Macroeconomics	4 (4-0-8)
ICMB 207 Management of Business Information	4 (4-0-8)
ICMB 213 Financial Accounting	4 (4-0-8)
ICMB 214 Managerial Accounting	4 (4-0-8)
ICMB 215 Business Finance for Entrepreneurs	4 (4-0-8)
ICMB 216 Business Communication	4 (4-0-8)
ICMB 222 Principle of Marketing	4 (4-0-8)
ICMB 235 Management and Organizational Behavior	4 (4-0-8)
ICMB 236 Human Resources Management	4 (4-0-8)
ICMB 237 International Business Management	4 (4-0-8)
ICMB 310 Business Law	4 (4-0-8)
ICMB 311 Business Ethics and Sustainability	4 (4-0-8)
ICMB 312 Management Science	4 (4-0-8)
ICMB 314 Operations and Project Management	4 (4-0-8)
ICMB 401 Business Innovation and Entrepreneurship	4 (4-0-8)
ICMB 402 Business Strategy	4 (4-0-8)
ICMB 490 Career Preparation	1 (1-0-2)

**Note I:** All BBA students are required to take either ICMB 401 Business Innovation and Entrepreneurship **or** ICMB 402 Business Strategy.

**Major Required Courses**

**no less than 20 credits**

ICBE 371 Strategic Choices of Consumers and Firms ICBE	4 (4-0-8)
372 World Economy	4 (4-0-8)
ICBE 373 Econometrics and Data Analysis	4 (4-0-8)
ICBE 471 Markets Structure and Pricing Strategies ICBE 472	4 (4-0-8)
Economic Policy Analysis	4 (4-0-8)

**Major Elective Courses**

**no less than 24 credits**

ICBE 481 Game Theory for Business	4 (4-0-8)
ICBE 482 Economic Integration	4 (4-0-8)
ICBE 483 Time Series Analysis for Business Forecasting	4 (4-0-8)
ICBE 486 Special Topics in Business Economics	4 (4-0-8)
ICMF 316 Financial Management	4 (4-0-8)
ICMK 353 Consumer Behavior and Decision Making	4 (4-0-8)
ICMB 496 Practical Business Training - On Campus	8 (2-32-10)
ICMB 497 Practical Business Training - Off Campus	8 (0-40-8)
ICMB 498 New Business Development Program	8 (2-32-10)

**Note:** All BBA students are required to take either ICMB 496 Practical Business Training – On Campus or ICMB 497 Practical Business Training – Off Campus or ICMB 498 New Business Development Program in their last year of study as part of the Major Elective Courses. Students are not allowed to register for other courses in the trimester, which either one of the three courses is taken.

**Interdisciplinary Elective Courses**

**no less than 20 credits**

Students are required to take courses for no less than a total of 20 credits from either of the following categories.

- Any 5 courses offered by MUIC's Business Administration Division
- 5 specific Minor courses offered by any BBA major. If a course designated by each major as a Minor course, is already taken and counted toward Major Required, Major Elective or Free Elective credits, students need to choose another Major Elective course in the program offering the Minor to fulfill the number of credits required in this course category.
- Specific Minor courses offered by other MUIC divisions.

**Free Elective Courses**

**no less than 8 credits**

Business Economics students **must select 8 credits** of free electives from **any of the courses** offered by Mahidol University. The choice is subject to the approval of the academic advisor.

# FINANCE

## PROGRAM

### DEGREES OFFERED

**Bachelor of Business Administration (Finance)**

**B.B.A. (Finance)**

### THE FIELD

The Finance Major is a rigorous program which will equip you with a solid financial foundation and essential quantitative skills for Finance. The distinctive feature of the Finance Major is its strong emphasis on corporate finance and financial investment, as well as emerging tools of financial technology; improvements in corporate governance; and financial strategies in emerging economies. The curriculum furnishes Finance Majors with the necessary knowledge in microeconomics; macroeconomics; data analytics; accounting; financial analysis; risk management; banking operations; and corporate governance. The courses are further tailored to provide students with practical computational skills; and an in-depth understanding of the application of financial theory in a world of disruptive innovation, further advanced through internships and research.

### CAREER OPPORTUNITIES

The BBA Finance Majors are well prepared for professional careers in: financial consulting; investment banking; financial and risk management; asset management; corporate finance; financial and economic research; as well as business entrepreneurs.

### CURRICULUM STRUCTURE

#### Business Administration Program

Courses	Credits
General Education Courses	42
Core Business Courses	69
Major Required Courses	20
Major Elective Courses	24
Interdisciplinary Elective Courses	20
Free Elective Courses	8
<b>Total</b>	<b>183</b>



# COURSE LIST

## Foundation Courses

	<b>Non-credit</b>
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

**Note I:** All BBA students are required to take ICID 100 Freshmen Seminar as a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

**Note III:** Students whose Mathematics placement is below ICGN 104 Mathematics and Its Contemporary Applications are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICGN 104 Mathematics and Its Contemporary Applications.

## General Education

**no less than 42 Credits**

### English Communication

**16 Credits**

*\*\* Compulsory Course \*\**

ICGC 103 Public Speaking *	4 (4-0-8)
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ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

**Note I:** All BBA students are required to take either a series of ICGC 101 Academic Writing and Research I and ICGC 102 Academic Writing and Research II or a series of ICGC 111 Academic Writing and Research I (Advanced) and ICGC 112 Academic Writing and Research II (Advanced), depending on their standard test or MUIC entrance exam scores. Students are also required to take ICGC 103 Public Speaking \* as a General Education course in the English Communication course group.

### Natural Sciences

**8 Credits**

*\*\* Compulsory Course \*\**

ICGN 104 Mathematics and Its Contemporary Applications *	4 (4-0-8)
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### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics *	4 (4-0-8)
ICGN 102 Essential Mathematics *	4 (4-0-8)

ICGN 103 Essential Statistics *	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

**Note I:** All BBA students are required to take ICGN 104 Mathematics and Its Contemporary Applications \* as a General Education course in the Natural Science course group.

**Note II:** All BBA students **are not allowed** to take **ICGN 101 Decision Mathematics, ICGN 102 Essential Mathematics, ICGN 103 Essential Statistics** and **ICGN 114 The Scientific Approach and Society** to fulfill the requirement of Natural Sciences.

**Humanities and Foreign Languages**

**8 Credits**

**Humanities**

• **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

• **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Note I:** All BBA students are required to take at least 1 course from the Humanities course group as a General Education course.

**Foreign Languages**
**German**

ICGL 101 Elementary German I 4 (4-0-8)

ICGL 102 Elementary German II 4 (4-0-8)

ICGL 103 Elementary German III 4 (4-0-8)

**Japanese**

ICGL 111 Elementary Japanese I 4 (4-0-8)

ICGL 112 Elementary Japanese II 4 (4-0-8)

ICGL 113 Elementary Japanese III 4 (4-0-8)

**French**

ICGL 121 Elementary French I 4 (4-0-8)

ICGL 122 Elementary French II 4 (4-0-8)

ICGL 123 Elementary French II 4 (4-0-8)

**Chinese**

ICGL 131 Elementary Chinese I 4 (4-0-8)

ICGL 132 Elementary Chinese II 4 (4-0-8)

ICGL 133 Elementary Chinese III 4 (4-0-8)

**Spanish**

ICGL 141 Elementary Spanish I 4 (4-0-8)

ICGL 142 Elementary Spanish II 4 (4-0-8)

ICGL 143 Elementary Spanish II 4 (4-0-8)

**Thai**

ICGL 160 Introduction to Thai Language and Culture 4 (4-0-8)

ICGL 161 Elementary Thai I 4 (4-0-8)

ICGL 162 Elementary Thai II 4 (4-0-8)

ICGL 163 Elementary Thai III 4 (4-0-8)

**Social Sciences**
**8 Credits**
**Financial, Economic Scientific and Environmental Literacy**

ICGS 101 Accounting for Young Entrepreneurs \*\* 4 (4-0-8)

ICGS 102 Business Sustainability and the Global Climate Change \*\* 4 (4-0-8)

ICGS 103 Economics in Modern Business \*\* 4 (4-0-8)

ICGS 104 Essentials of Entrepreneurship \*\* 4 (4-0-8)

ICGS 105 Personal Financial Management \*\* 4 (4-0-8)

ICGS 106 Fashion and Society 4 (4-0-8)

ICGS 107 MICE 101 \*\* 4 (4-0-8)

ICGS 108 Money Matters \*\* 4 (4-0-8)

**Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life 4 (4-0-8)

ICGS 110 Development and Conflicts 4 (4-0-8)

ICGS 111 Exploring Religions 4 (4-0-8)

ICGS 112 Geography of Human Activities 4 (4-0-8)

ICGS 113 Perspectives on the Thai Past 4 (4-0-8)

ICGS 114 Power, Money and Behavior of Powerful States 4 (4-0-8)

ICGS 115 Sociology in the Modern World 4 (4-0-8)

ICGS 116 Power and Politics 4 (4-0-8)

ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination 4 (4-0-8)

ICGS 118 Skills in Dealing with People Across Cultures \*\* 4 (4-0-8)

ICGS 119 World Politics 4 (4-0-8)

ICGS 120 Global Awareness 4 (4-0-8)

**• Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**Note I:** \*\* All BBA students **are not allowed** to take ICGS 101, ICGS 102, ICGS 103, ICGS 104, ICGS 105, ICGS 107, ICGS 108, and ICGS 118 to fulfill the requirement of Social Sciences. \*\*

**Physical Education**
**2 Credits**

ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

**Core Business courses**
**no less than 69 Credits**
**Requirements to start taking BBA courses**

Students are able to take BBA courses only if they have met the following requirements:

1. Passed ICGC 102 Academic Writing and Research II or ICGC 112 Academic Writing and Research II (Advanced) with at least "D" grade
2. Passed ICGN 104 Mathematics and Its Contemporary Applications with at least "D" grade.

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ICMB 201 Business Statistics	4 (4-0-8)
ICMB 205 Microeconomics	4 (4-0-8)
ICMB 206 Macroeconomics	4 (4-0-8)
ICMB 207 Management of Business Information	4 (4-0-8)
ICMB 213 Financial Accounting	4 (4-0-8)
ICMB 214 Managerial Accounting	4 (4-0-8)
ICMB 215 Business Finance for Entrepreneurs	4 (4-0-8)
ICMB 216 Business Communication	4 (4-0-8)
ICMB 222 Principle of Marketing	4 (4-0-8)
ICMB 235 Management and Organizational Behavior	4 (4-0-8)
ICMB 236 Human Resources Management	4 (4-0-8)
ICMB 237 International Business Management	4 (4-0-8)
ICMB 310 Business Law	4 (4-0-8)
ICMB 311 Business Ethics and Sustainability	4 (4-0-8)
ICMB 312 Management Science	4 (4-0-8)
ICMB 314 Operations and Project Management	4 (4-0-8)
ICMB 401 Business Innovation and Entrepreneurship	4 (4-0-8)
ICMB 402 Business Strategy	4 (4-0-8)

ICMB 490 Career Preparation 1 (1-0-2)

**Note I:** All BBA students are required to take either ICMB 401 Business Innovation and Entrepreneurship or ICMB 402 Business Strategy.

**Major Required Courses** **no less than 20 credits**

ICMF 316 Financial Management	4 (4-0-8)
ICMF 317 International Financial Markets	4 (4-0-8)
ICMF 318 Investment Analysis and Portfolio Management	4 (4-0-8)
ICMF 319 Multinational Corporate Finance	4 (4-0-8)
ICMF 420 Financial Analysis and Modeling	4 (4-0-8)

**Major Elective Courses** **no less than 24 credits**

ICBE 373 Econometrics and Data Analysis	4 (4-0-8)
ICMF 320 Business Taxation	4 (4-0-8)
ICMF 321 Intermediate Accounting	4 (4-0-8)
ICMF 322 Risk Management and Derivative	4 (4-0-8)
ICMF 323 Banking and Financial Institutions Management	4 (4-0-8)
ICMF 324 Big Data and Financial Analytics	4 (4-0-8)
ICMF 425 Corporate and Alternative Asset Valuation	4 (4-0-8)
ICMF 426 Special Topics in Finance	4 (4-0-8)
ICMF 427 Financial Theory and Innovations in a Disruptive World	4 (4-0-8)
ICMB 496 Practical Business Training - On Campus	8 (2-32-10)
ICMB 497 Practical Business Training - Off Campus	8 (0-40-8)
ICMB 498 New Business Development Program	8 (2-32-10)

**Note:** All BBA students are required to take either ICMB 496 Practical Business Training – On Campus or ICMB 497 Practical Business Training – Off Campus or ICMB 498 New Business Development Program in their last year of study as part of the Major Elective Courses. Students are not allowed to register for other courses in the trimester, which either one of the three courses is taken.

**Interdisciplinary Elective Courses** **no less than 20 credits**

Students are required to take courses for no less than a total of 20 credits from either of the following categories.

- Any 5 courses offered by MUIC's Business Administration Division
- 5 specific Minor courses offered by any BBA major. If a course designated by each major as a Minor course, is already taken and counted toward Major Required, Major Elective or Free Elective credits, students need to choose another Major Elective course in the program offering the Minor to fulfill the number of credits required in this course category.
- Specific Minor courses offered by other MUIC divisions.

**Free Elective Courses** **no less than 8 credits**

Finance students must select 8 credits of free electives from any of the courses offered by Mahidol University. The choice is subject to the approval of the academic advisor.

# INTERNATIONAL BUSINESS PROGRAM

## DEGREES OFFERED

Bachelor of Business Administration (International Business)

B.B.A. (International Business)

## THE FIELD

Given the rapid and ever-increasing developments in globalization, the International Business Major has become one of the most popular academic programs at MUIC, particularly since it explores all facets of operating a business internationally. The curriculum offers a wide range of business issues and concerns in the areas of economics, trade, finance, marketing, human resources, operations, legal issues, ethics, import and export, the impact on foreign direct investment (FDI) as well as global business competition and co-operation. Business negotiations and international business management are emphasized in such a way as to provide students with a greater insight into global leadership development and identifying alternative approaches for entering various markets worldwide.

## CAREER OPPORTUNITIES

Apart from pursuing graduate studies in their designated field, International Business majors can readily secure managerial positions in multinational corporations in such areas as import/exports, operations and sales, logistics and business development. Opportunities also exist in international business and strategic management as well as entrepreneurial endeavors.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	42
Core Business Courses	69
Major Required Courses	20
Major Elective Courses	24
Interdisciplinary Elective Courses	20
Free Elective Courses	8
<b>Total</b>	<b>183</b>

# COURSE LIST

## Foundation Courses

	Non-credit
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

**Note I:** All BBA students are required to take ICID 100 Freshmen Seminar as a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

**Note III:** Students whose Mathematics placement is below ICGN 104 Mathematics and Its Contemporary Applications are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICGN 104 Mathematics and Its Contemporary Applications.

## General Education

no less than 42 Credits

### English Communication

16 Credits

**\*\* Compulsory Course \*\***

ICGC 103 Public Speaking \* 4 (4-0-8)

ICGC 101 Academic Writing and Research I 4 (4-0-8)

ICGC 102 Academic Writing and Research II 4 (4-0-8)

ICGC 111 Academic Writing and Research I (Advanced) 4 (4-0-8)

ICGC 112 Academic Writing and Research II (Advanced) 4 (4-0-8)

ICGC 201 Global Realities 4 (4-0-8)

ICGC 202 Literary Analysis 4 (4-0-8)

ICGC 203 Creative Writing 4 (4-0-8)

ICGC 204 Advanced Oral Communication 4 (4-0-8)

ICGC 205 Linguistics 4 (4-0-8)

ICGC 206 Literature Into Film 4 (4-0-8)

ICGC 207 Diverse English Speaking Cultures 4 (4-0-8)

ICGC 208 Language and Culture 4 (4-0-8)

ICGC 209 The Story of English 4 (4-0-8)

ICGC 210 First and Second Language Acquisition 4 (4-0-8)

ICGC 211 Topics in Comparative Literature A: Poetry 4 (4-0-8)

ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel 4 (4-0-8)

ICGC 213 Topics in Comparative Literature C: Drama 4 (4-0-8)

**Note I:** All BBA students are required to take either a series of ICGC 101 Academic Writing and Research I and ICGC 102 Academic Writing and Research II or a series of ICGC 111 Academic Writing and Research I (Advanced) and ICGC 112 Academic Writing and Research II (Advanced), depending on their standard test or MUIC entrance exam scores. Students are also required to take ICGC 103 Public Speaking \* as a General Education course in the English Communication course group.

## Natural Sciences

8 Credits

**\*\* Compulsory Course \*\***

ICGN 104 Mathematics and Its Contemporary Applications \* 4 (4-0-8)

**• Scientific and Environmental Literacy**

ICGN 101 Decision Mathematics*	4 (4-0-8)
ICGN 102 Essential Mathematics*	4 (4-0-8)
ICGN 103 Essential Statistics*	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

**• ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

**Note I:** All BBA students are required to take ICGN 104 Mathematics and Its Contemporary Applications \* as a General Education course in the Natural Science course group.

**Note II:** All BBA students **are not allowed** to take **ICGN 101 Decision Mathematics, ICGN 102 Essential Mathematics, ICGN 103 Essential Statistics** and **ICGN 114 The Scientific Approach and Society** to fulfill the requirement of Natural Sciences.

**Humanities and Foreign Languages**
**12 Credits**
**Humanities**
**• Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

**• Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Note I:** All BBA students are required to take at least 1 course from the Humanities course group as a General Education course.



<b>Foreign Languages</b>	<b>8 Credits</b>
• <b>German</b>	
ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)
• <b>Japanese</b>	
ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)
• <b>French</b>	
ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)
• <b>Chinese</b>	
ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)
• <b>Spanish</b>	
ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)
• <b>Thai</b>	
ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)

**Note I:** All BBA in International Business students are required to take 2 sequential foreign language courses as General Education courses in the Humanities and Foreign Languages course group.

<b>Social Sciences</b>	<b>4 Credits</b>
<b>Financial, Economic Scientific and Environmental Literacy</b>	
ICGS 101 Accounting for Young Entrepreneurs **	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change **	4 (4-0-8)
ICGS 103 Economics in Modern Business **	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship **	4 (4-0-8)
ICGS 105 Personal Financial Management **	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101 **	4 (4-0-8)
ICGS 108 Money Matters **	4 (4-0-8)
<b>Global and Multicultural Literacy</b>	
ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)

ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures **	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)
<b>• Psychological Literacy</b>	
ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**Note I:** \*\* All BBA students **are not allowed** to take ICGS 101, ICGS 102, ICGS 103, ICGS 104, ICGS 105, ICGS 107, ICGS 108, and ICGS 118 to fulfill the requirement of Social Sciences. \*\*

<b>Physical Education</b>	<b>2 Credits</b>
ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

#### Core Business courses

no less than 69 credits

#### Requirements to start taking BBA courses

Students are able to take BBA courses only if they have met the following requirements:

1. Passed ICGC 102 Academic Writing and Research II or ICGC 112 Academic Writing and Research II (Advanced) with at least "D" grade
2. Passed ICGN 104 Mathematics and Its Contemporary Applications with at least "D" grade.

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ICMB 201 Business Statistics	4 (4-0-8)
ICMB 205 Microeconomics	4 (4-0-8)
ICMB 206 Macroeconomics	4 (4-0-8)
ICMB 207 Management of Business Information	4 (4-0-8)
ICMB 213 Financial Accounting	4 (4-0-8)
ICMB 214 Managerial Accounting	4 (4-0-8)
ICMB 215 Business Finance for Entrepreneurs	4 (4-0-8)
ICMB 216 Business Communication	4 (4-0-8)
ICMB 222 Principle of Marketing	4 (4-0-8)
ICMB 235 Management and Organizational Behavior	4 (4-0-8)
ICMB 236 Human Resources Management	4 (4-0-8)
ICMB 237 International Business Management	4 (4-0-8)
ICMB 310 Business Law	4 (4-0-8)
ICMB 311 Business Ethics and Sustainability	4 (4-0-8)
ICMB 312 Management Science	4 (4-0-8)

ICMB 314 Operations and Project Management	4 (4-0-8)
ICMB 401 Business Innovation and Entrepreneurship	4 (4-0-8)
ICMB 402 Business Strategy	4 (4-0-8)
ICMB 490 Career Preparation	1 (1-0-2)

**Note I:** All BBA students are required to take either ICMB 401 Business Innovation and Entrepreneurship or ICMB 402 Business Strategy.

**Major Required Courses** **no less than 20 credits**

ICMI 331 Global Logistics and Supply Chain Management	4 (4-0-8)
ICMI 332 Diversity, Cross Culture and Expatriate Management	4 (4-0-8)
ICMI 333 Global Trade, Policies, and Regulations	4 (4-0-8)
ICMI 431 Risk Management in International Business	4 (4-0-8)
ICMI 432 Internalization Strategy	4 (4-0-8)

**Elective International Business Courses** **no less than 24 credits**

ICBE 372 World Economy	4 (4-0-8)
ICMI 334 Regional Business Study	4 (4-0-8)
ICMI 335 Legal Issues in International Business	4 (4-0-8)
ICMI 336 Leadership and Change Management in Global Business	4 (4-0-8)
ICMI 337 Management and Governance in Multinational Enterprise	4 (4-0-8)
ICMI 436 Special Topics in International Business	4 (4-0-8)
ICMK 453 Global Marketing Strategy	4 (4-0-8)
ICMB 496 Practical Business Training - On Campus	8 (2-32-10)
ICMB 497 Practical Business Training - Off Campus	8 (0-40-8)
ICMB 498 New Business Development Program	8 (2-32-10)

**Note:** All BBA students are required to take either ICMB 496 Practical Business Training – On Campus or ICMB 497 Practical Business Training – Off Campus or ICMB 498 New Business Development Program in their last year of study as part of the Major Elective Courses. Students are not allowed to register for other courses in the trimester, which either one of the three courses is taken.

**Interdisciplinary Elective Courses** **no less than 20 credits**

Students are required to take courses for no less than a total of 20 credits from either of the following categories.

- Any 5 courses offered by MUIC's Business Administration Division
- 5 specific Minor courses offered by any BBA major. If a course designated by each major as a Minor course, is already taken and counted toward Major Required, Major Elective or Free Elective credits, students need to choose another Major Elective course in the program offering the Minor to fulfill the number of credits required in this course category.
- Minor courses offered by other MUIC divisions.

**Free Elective Courses** **no less than 8 credits**

International Business students must select 8 credits of free electives from any of the courses offered by Mahidol University. The choice is subject to the approval of the academic advisor.

# MARKETING PROGRAM

## DEGREES OFFERED

Bachelor of Business Administration (Marketing)

B.B.A. (Marketing)

## THE FIELD

The Marketing Major provides students with relevant marketing skills, a crucial component of any business which includes conducting research to learn about the needs of customers, developing new products or refining existing ones, setting prices, determining where products should be sold and promoting the product to the final users. The curriculum furnishes Marketing majors with a sound foundation in the basics of marketing, consumer behavior and marketing research before advancing to the higher level modules of different marketing strategy courses. Students learn how to analyze situations and implement strategies under different market environments through lectures, class discussions, case studies and projects.

## CAREER OPPORTUNITIES

Marketing majors are well qualified to meet the challenges of working in the business sector. Career opportunities in local and multinational companies include positions as marketing, brand and product managers, trade marketers in retail operations and research analysts, in addition to account executives in advertising agencies, marketing jobs in non-governmental organizations and entrepreneurial ventures. Many of our majors go on to pursue their graduate studies in Business Administration or Marketing Research, Communication and Logistics.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	42
Core Business Courses	69
Major Required Courses	20
Major Elective Courses	24
Interdisciplinary Elective Courses	20
Free Elective Courses	8
<b>Total</b>	<b>183</b>

# COURSE LIST

## Foundation Courses

	<b>Non-credit</b>
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

**Note I:** All BBA students are required to take ICID 100 Freshmen Seminar as a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

**Note III:** Students whose Mathematics placement is below ICGN 104 Mathematics and Its Contemporary Applications are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICGN 104 Mathematics and Its Contemporary Applications.

## General Education

**no less than 42 credits**

### English Communication

**16 Credits**

\*\* Compulsory Course \*\*

ICGC 103 Public Speaking *	4 (4-0-8)
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ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

**Note I:** All BBA students are required to take either a series of ICGC 101 Academic Writing and Research I and ICGC 102 Academic Writing and Research II or a series of ICGC 111 Academic Writing and Research I (Advanced) and ICGC 112 Academic Writing and Research II (Advanced), depending on their standard test or MUIC entrance exam scores. Students are also required to take ICGC 103 Public Speaking \* as a General Education course in the English Communication course group.

## Natural Sciences

**8 Credits**

\*\* Compulsory Course \*\*

ICGN 104 <b>Mathematics</b> and Its Contemporary Applications *	4 (4-0-8)
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### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)

ICGN 103 Essential Statistics	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

**Note I:** All BBA students are required to take ICGN 104 Mathematics and Its Contemporary Applications \* as a General Education course in the Natural Science course group.

**Note II:** All BBA students **are not allowed** to take **ICGN 101 Decision Mathematics, ICGN 102 Essential Mathematics, ICGN 103 Essential Statistics** and **ICGN 114 The Scientific Approach and Society** to fulfill the requirement of Natural Sciences.

**Humanities and Foreign Languages**

**8 Credits**

**Humanities**

• **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

• **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Note I:** All BBA students are required to take at least 1 course from the Humanities course group as a General Education course.

**Foreign Languages**
**German**

ICGL 101 Elementary German I 4 (4-0-8)

ICGL 102 Elementary German II 4 (4-0-8)

ICGL 103 Elementary German III 4 (4-0-8)

**Japanese**

ICGL 111 Elementary Japanese I 4 (4-0-8)

ICGL 112 Elementary Japanese II 4 (4-0-8)

ICGL 113 Elementary Japanese III 4 (4-0-8)

**French**

ICGL 121 Elementary French I 4 (4-0-8)

ICGL 122 Elementary French II 4 (4-0-8)

ICGL 123 Elementary French III 4 (4-0-8)

**Chinese**

ICGL 131 Elementary Chinese I 4 (4-0-8)

ICGL 132 Elementary Chinese II 4 (4-0-8)

ICGL 133 Elementary Chinese III 4 (4-0-8)

**Spanish**

ICGL 141 Elementary Spanish I 4 (4-0-8)

ICGL 142 Elementary Spanish II 4 (4-0-8)

ICGL 143 Elementary Spanish III 4 (4-0-8)

**Thai**

ICGL 160 Introduction to Thai Language and Culture 4 (4-0-8)

ICGL 161 Elementary Thai I 4 (4-0-8)

ICGL 162 Elementary Thai II 4 (4-0-8)

ICGL 163 Elementary Thai III 4 (4-0-8)

**Social Sciences**
**8 Credits**
**Financial, Economic Scientific and Environmental Literacy**

ICGS 101 Accounting for Young Entrepreneurs \*\* 4 (4-0-8)

ICGS 102 Business Sustainability and the Global Climate Change \*\* 4 (4-0-8)

ICGS 103 Economics in Modern Business \*\* 4 (4-0-8)

ICGS 104 Essentials of Entrepreneurship \*\* 4 (4-0-8)

ICGS 105 Personal Financial Management \*\* 4 (4-0-8)

ICGS 106 Fashion and Society 4 (4-0-8)

ICGS 107 MICE 101 \*\* 4 (4-0-8)

ICGS 108 Money Matters \*\* 4 (4-0-8)

**Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life 4 (4-0-8)

ICGS 110 Development and Conflicts 4 (4-0-8)

ICGS 111 Exploring Religions 4 (4-0-8)

ICGS 112 Geography of Human Activities 4 (4-0-8)

ICGS 113 Perspectives on the Thai Past 4 (4-0-8)

ICGS 114 Power, Money and Behavior of Powerful States 4 (4-0-8)

ICGS 115 Sociology in the Modern World 4 (4-0-8)

ICGS 116 Power and Politics 4 (4-0-8)

ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination 4 (4-0-8)

ICGS 118 Skills in Dealing with People Across Cultures \*\* 4 (4-0-8)

ICGS 119 World Politics 4 (4-0-8)

ICGS 120 Global Awareness 4 (4-0-8)

**• Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**Note 1:** All BBA students **are not allowed** to take ICGS 101, ICGS 102, ICGS 103, ICGS 104, ICGS 105, ICGS 107, ICGS 108, and ICGS 118 to fulfill the requirement of Social Sciences.

**Physical Education**
**2 Credits**

ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

**Core Business courses**
**no less than 69 Credits**
**Requirements to start taking BBA courses**

Students are able to take BBA courses only if they have met the following requirements:

1. Passed ICGC 102 Academic Writing and Research II or ICGC 112 Academic Writing and Research II (Advanced) with at least "D" grade
2. Passed ICGN 104 Mathematics and Its Contemporary Applications with at least "D" grade.

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ICMB 201 Business Statistics	4 (4-0-8)
ICMB 205 Microeconomics	4 (4-0-8)
ICMB 206 Macroeconomics	4 (4-0-8)
ICMB 207 Management of Business Information	4 (4-0-8)
ICMB 213 Financial Accounting	4 (4-0-8)
ICMB 214 Managerial Accounting	4 (4-0-8)
ICMB 215 Business Finance for Entrepreneurs	4 (4-0-8)
ICMB 216 Business Communication	4 (4-0-8)
ICMB 222 Principle of Marketing	4 (4-0-8)
ICMB 235 Management and Organizational Behavior	4 (4-0-8)
ICMB 236 Human Resources Management	4 (4-0-8)
ICMB 237 International Business Management	4 (4-0-8)
ICMB 310 Business Law	4 (4-0-8)
ICMB 311 Business Ethics and Sustainability	4 (4-0-8)
ICMB 312 Management Science	4 (4-0-8)
ICMB 314 Operations and Project Management	4 (4-0-8)
ICMB 401 Business Innovation and Entrepreneurship	4 (4-0-8)
ICMB 402 Business Strategy	4 (4-0-8)



ICMB 490 Career Preparation 1 (1-0-2)

**Note I:** All BBA students are required to take either ICMB 401 Business Innovation and Entrepreneurship or ICMB 402 Business Strategy.

**Major Required Courses** **no less than 20 credits**

ICMK 351 Consumer Insight – A Qualitative Approach	4 (4-0-8)
ICMK 352 Market Intelligence – A Quantitative Approach	4 (4-0-8)
ICMK 353 Consumer Behavior and Decision Making	4 (4-0-8)
ICMK 361 Digital Marketing	4 (4-0-8)
ICMK 461 Marketing Strategy for Sustainability	4 (4-0-8)

**Major Elective Courses** **no less than 24 credits**

ICBE 471 Market Structures and Pricing Strategies	4 (4-0-8)
ICMI 331 Global Logistics and Supply Chain Management	4 (4-0-8)
ICMK 354 New Product Management	4 (4-0-8)
ICMK 355 Integrated Marketing Communication	4 (4-0-8)
ICMK 362 Strategic Brand Management	4 (4-0-8)
ICMK 451 Distribution and Retail Channels	4 (4-0-8)
ICMK 452 Business Marketing and Selling Strategy	4 (4-0-8)
ICMK 453 Global Marketing Strategy	4 (4-0-8)
ICMK 456 Special Topic in Marketing	4 (4-0-8)
ICMB 496 Practical Business Training - On Campus	8 (2-32-10)
ICMB 497 Practical Business Training - Off Campus	8 (0-40-8)
ICMB 498 New Business Development Program	8 (2-32-10)

**Note :** All BBA students are required to take either ICMB 496 Practical Business Training – On Campus or ICMB 497 Practical Business Training – Off Campus or ICMB 498 New Business Development Program in their last year of study as part of the Major Elective Courses. Students are not allowed to register for other courses in the trimester, which either one of the three courses is taken.

**Interdisciplinary Elective Courses** **no less than 20 credits**

Students are required to take courses for no less than a total of 20 credits from either of the following categories.

- Any 5 courses offered by MUIC's Business Administration Division
- 5 specific Minor courses offered by any BBA major. If a course designated by each major as a Minor course, is already taken and counted toward Major Required, Major Elective or Free Elective credits, students need to choose another Major Elective course in the program offering the Minor to fulfill the number of credits required in this course category.
- Minor courses offered by other MUIC divisions.

**Free Elective Courses** **no less than 8 credits**

Marketing students **must select 8 credits** of free electives from **any of the courses** offered by Mahidol University. The choice is subject to the approval of the academic advisor.





# FINE AND APPLIED ARTS

Division

# COMMUNICATION DESIGN PROGRAM

## DEGREES OFFERED

Bachelor of Fine Arts (Communication Design)

B.F.A. (Communication Design)

## THE FIELD

CDP is a studio design program that combines a strong general education, acquisition of theoretical knowledge and intensive creative practice in an international environment. Class sizes are small and instructors work closely with students to help ensure favorable outcomes. The coursework stresses hand-on experience, practical and constructive application of critical thinking skills, and effective communication of innovative ideas. Areas of study include typography, publication design, corporate identity and integrated branding, advertising, information graphics, environmental graphics, package design, digital media design, and illustration.

## CAREER OPPORTUNITIES

Communication Design graduates will have developed a professional portfolio in preparation for various career opportunities, such as in advertising agencies, printing and publishing companies, graphic design firms, interactive and multimedia production houses, information graphic design based agencies, environmental graphic design based firms, and in-house art and design divisions.

## CURRICULUM STRUCTURE

Course	Credits
General Education Courses	40
Required Courses	116
Major Elective Courses	12
Free Elective	8
<b>Total</b>	<b>176</b>

# COURSE LIST

## Foundation Courses

	<b>Non-Credit</b>
ICID 100 Freshman Seminar	0 (0-1-0)
ICME 100 English Resource Skills	0 (4-0-0)

*\*Note I:* All students must take ICID 100 Freshman Seminar, a non-credit course.

*\*Note II:* Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

## General Education Courses

**no less than 40 credits**

### English Communication

**16 Credits**

ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 103 Public Speaking	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing *	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

*\*recommended*

## Humanities and Foreign Languages

**12 Credits**

### Humanities

#### • Logical and Ethical Literacy

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

#### • Arts and Media Literacy

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)

ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

### Foreign Languages

#### • German

ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)

#### • Japanese

ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)

#### • French

ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)

#### • Chinese

ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)

#### • Spanish

ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)

#### • Thai

ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)

### Natural Sciences

**4 Credits**

#### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)
ICGN 103 Essential Statistics	4 (4-0-8)
ICGN 104 Mathematics and Its Contemporary Applications	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)



ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

**Social Sciences**

**8 Credits**

• **Financial, Economic, Business and Entrepreneurial Literacy**

ICGS 101 Accounting for Young Entrepreneurs	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change	4 (4-0-8)
ICGS 103 Economics in Modern Business	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 105 Personal Financial Management	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)

• **Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)

• **Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**B. Specific Courses**

**No less than 128 Credits**

**Required Courses**

**116 Credits**

ICCD 102 CD Seminar	4 (4-0-8)
ICCD 103 Research Studio	4 (2-4-6)
ICCD 112 Drawing Studio	4 (2-4-6)
ICCD 119 2D Design Principles	4 (2-4-6)
ICCD 121 Color for Design	4 (2-4-6)
ICCD 130 3D Design Principles	4 (2-4-6)
ICCD 140 Digital Images and Processes	4 (2-4-6)
ICCD 150 Art History	4 (4-0-8)

ICCD 201 Conceptual Development	4 (2-4-6)
ICCD 202 Professional Ethics	4 (4-0-8)
ICCD 210 CD Studio	4 (2-4-6)
ICCD 219 Typography	4 (2-4-6)
ICCD 221 Print Production	4 (2-4-6)
ICCD 222 Traditional Techniques Studio	4 (2-4-6)
ICCD 239 Online Culture Communication	4 (2-4-6)
ICCD 250 Graphic Design History	4 (4-0-8)
ICCD 320 Environmental Graphics	4 (2-4-6)
ICCD 321 Infographics	4 (2-4-6)
ICCD 322 Integrated Branding	4 (2-4-6)
ICCD 323 Advertising Campaign Development	4 (2-4-6)
ICCD 324 Package Design	4 (2-4-6)
ICCD 341 Online Communication Strategic Planning	4 (2-4-6)
ICCD 342 New Media Design	4 (2-4-6)
ICCD 400 Thesis Research and Development	4 (4-0-8)
ICCD 401 Thesis Writing Seminar	4 (4-0-8)
ICCD 410 Thesis Design	4 (2-4-6)
ICCD 411 Thesis Production	4 (2-4-6)
ICCD 420 Portfolio Development	4 (4-0-8)
ICCD 421 Exhibition and Planning	4 (2-4-6)
<b>Major Elective Courses</b>	<b>12 Credits</b>
ICCD 280 Study Trips: Regional	2 (0-4-2)
ICCD 281 Study Trips: International	2 (0-4-2)
ICCD 231 Current Issues in Communication Design	4 (4-0-8)
ICCD 290 Typeface Design	4 (2-4-6)
ICCD 300 Internship	4 (4-0-8)
ICCD 326 Communication Design Practicum	4 (2-4-6)

**Free Electives**
**No less than 8 Credits**

Students can take any courses offered by Mahidol University as a free elective course with an approval from their advisors.



# MEDIA AND COMMUNICATION PROGRAM

## DEGREES OFFERED

Bachelor of Communication Arts (Media and Communication)

B. Com. Arts (Media and Communication)

## CONCENTRATION

- 1) Mass Communication and Journalism Concentration
- 2) Creative Content Concentration

## THE FIELD

The Media and Communication Program is the first degree program in Thailand that both focuses on today's converging media environments and designs to prepare students for emerging ASEAN markets. The courses combine the field of Mass Communication and Journalism, and creative content i.e. acting, directing and scriptwriting. Through the integration of Theory and Practice, the curriculum delivers both knowledge and application. This method allows students to gain a deep understanding of theory while equipping them with the necessary skills for entering the workforce. The students, thus, are expected to have a broad range of knowledge and creative skills, from critical thinking and excellent writing to the ability to create strategic communication campaign, sharp media issues, interactive media, performing art projects, and media policy etc. The graduates will understand, initiate and use media creatively as a communication tool, from the personal, to corporate, to community, to national and global levels.

## CAREER OPPORTUNITIES

- **Mass Communication and Journalism Concentration**

Journalists, News Editors and TV anchors, TV Documentary Makers, Broadcast Media Producers, Feature Writers, Media Consultants and Researchers, Media Public Policy Makers

- **Creative Content Concentration**

Actors, Directors, Scriptwriters, and Producers for the entertainment industry e.g. theatre, film and TV; Acting Coach, Event Organizers and Stage Managers, Crews in production houses for film and advertising agencies

## CURRICULUM STRUCTURE

### Media and Communication Major

Courses	Credits
General Education Courses	52
Core Courses in Media and Communication	56
Major Required Courses	24
Major Elective Tracks	16
Compulsory Elective Courses	24
Free Elective Courses	8
<b>Total</b>	<b>180</b>

# COURSE LIST

**General Education** **48-52 Credits**

**English Communication** **12-16 Credits**

**Regular Track**

ICME 100 English Resources Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

**Advanced Track**

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

**200+ Level Courses**

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

**Note:**

*I.* Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'regular track' or 'advanced track' for their General Education requirement in English.

*II.* Students in 'regular track' are required to take the first 12 credits in ICCM 104, ICCM 105, ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.

*III.* Students in 'advanced track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.

*IV.* Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

**Natural Science** **8 Credits**

**Compulsory Courses**

ICNS 105 Basic Mathematics	4 (4-0-8)
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• **Students take one of these courses to fulfill the requirement of Natural Science**

ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)

ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

**Humanities**
**16 Credits**
**Compulsory Courses**

ICID 100 Freshman Seminar	0 (1-0-0)
ICHM 143 Introduction to Photography	4 (4-0-8)

*\*Recommendation Courses*

ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 144 Intermediate Photography	4 (4-0-8)

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ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)

ICLG 211 Pre-Intermediate German I	4 (4-0-8)
ICLG 212 Pre-Intermediate German II	4 (4-0-8)
ICLG 213 Pre-Intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-Intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-Intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-Intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-Intermediate French I	4 (4-0-8)
ICLF 212 Pre-Intermediate French II	4 (4-0-8)
ICLF 213 Pre-Intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-Intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-Intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-Intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-Intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-Intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-Intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodia I	4 (4-0-8)
ICML 192 Elementary Cambodia II	4 (4-0-8)
ICML 193 Elementary Cambodia III	4 (4-0-8)

**Social Science**
**8 Credits**
*\*Recommendation Courses*

ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
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ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)

ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Thai Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia Since c. 1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History Since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)

ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)

**Health Science and Physical Education**
**4 credits**

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-3-1)
ICPE 102 Physical Education: Basketball	1 (0-3-1)
ICPE 103 Physical Education: Golf	1 (0-3-1)
ICPE 105 Physical Education: Swimming	1 (0-3-1)
ICPE 106 Physical Education: Tennis	1 (0-3-1)
ICPE107 Physical Education: Volleyball	1 (0-3-1)
ICPE 109 Physical Education: Social Dance	1 (0-3-1)
ICPE 113 Physical Education: Modern Dance	1 (0-3-1)
ICPE 115 Self Defense	1 (0-3-1)
ICPE 117 Physical Education: Mind and Body	1 (0-3-1)
ICPE 118 Physical Education: American Flag Football	1 (0-3-1)
ICPE 121 Physical Education: Soccer	1 (0-3-1)
ICPE 123 Physical Education: Cycling	1 (0-3-1)
ICPE 124 Selected Topics in Sports	1 (0-3-1)

**Major Courses**
**120 credits**

All Media and Communication students study the same courses in Core and Compulsory Electives, but when choosing Required Courses, they have to determine one of two concentrations, either Mass Communication and Journalism or Creative Content.

Then when choosing courses in Major Electives, students can choose to follow one of seven tracks available, or also, they can tailor their own track by choosing 4 subjects from any track subject to the availability of the class.

**Core Courses**
**56 credits**

ICMC 101 Introduction to Media and Communication	4 (4-0-8)
ICMC 102 Man and Arts for Media and Communication	4 (4-0-8)
ICMC 103 Visual Communication	4 (4-0-8)
ICMC 104 Audio Communication	4 (4-0-8)
ICMC 105 Media, Communication, Art and Socio-Cultural Perspectives In Southeast Asia	4 (4-0-8)
ICMC 106 Creative Writing for Communication	4 (4-0-8)

ICMC 107 Global Media Culture and Industry	4 (4-0-8)
ICMC 201 Media and Communication Regulations and Ethics	4 (4-0-8)
ICMC 202 Media and Cultural Theory	4 (4-0-8)
ICMC 203 Popular Entertainment	4 (4-0-8)
ICMC 204 Research Methods and Basic Statistics in Communication and Cultural Studies	4 (4-0-8)
ICMC 205 Media Psychology and Audience Analysis	4 (4-0-8)
ICMC 206 Basic Acting	4 (0-8-4)
ICMC 207 Entertainment Management, Marketing and Finance	4 (4-0-8)

**Major Required Courses**
**24 credits**
**Concentration I: Mass Communication and Journalism**

ICMC 211 Introduction to Mass Communication and Journalism	4 (4-0-8)
ICMC 212 Writing and Presenting in Mass Communication and Journalism	4 (4-0-8)
ICMC 213 Mass Media and Public Policy	4 (4-0-8)
ICMC 214 Comparative Media Issues: ASEAN vs the world	4 (4-0-8)
ICMC 215 Integrated Broadcasting Production: Creating Television and New Media Content	4 (0-8-4)
ICMC 216 Convergence Journalism: Writing and Producing for Media	4 (4-0-8)

**Concentration II: Creative Content**

ICMC 221 Art of Storyboarding	4 (4-0-8)
ICMC 222 Textual Analysis	4 (4-0-8)
ICMC 223 Southeast Asian Creative Content Analysis: from Ethno-Historiography Perspectives	4 (4-0-8)
ICMC 224 Literature as a Source of Media Content	4 (4-0-8)
ICMC 225 Visual Storytelling	4 (4-0-8)
ICMC 226 Movement and Human Body	4 (0-8-4)

**Major Elective Tracks**
**16 credits**
**(Study 1 track or choose 4 subjects from any track)**
**Track I: Writing**

ICMC 311 Dramatic Writing	4 (4-0-8)
ICMC 312 TV Script Writing	4 (4-0-8)
ICMC 313 Film Screenwriting	4 (4-0-8)
ICMC 314 Style and Presentation in Writing	4 (4-0-8)

**Track II: Acting**

ICMC 321 Acting I: the Fundamentals	4 (0-8-4)
ICMC 322 Acting II: Advanced Acting	4 (0-8-4)
ICMC 323 Acting for TV and Film	4 (0-8-4)
ICMC 324 Choreography	4 (0-8-4)

**Track III: Directing**

ICMC 312 TV Script Writing	4 (4-0-8)
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*Or*

ICMC 313 Film Screenwriting	4 (0-8-4)
ICMC 331 Directing I: Directing the Actors	4 (0-8-4)
ICMC 332 Directing II: Directing for Recorded Media	4 (0-8-4)
ICMC 352 TV Pre-Production	4 (4-0-8)

*Or*

ICMC 362 Film Pre-Production	4 (4-0-8)
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**Track IV: Critical Studies**

ICMC 341 Genre Studies	4 (4-0-8)
ICMC 342 Film Criticism	4 (4-0-8)
ICMC 343 Approaches to Media-Film and TV-Theory and Critical Studies	4 (4-0-8)
ICMC 344 Film History	4 (4-0-8)

**Track V: TV Production**

ICMC 312 TV Scriptwriting	4 (4-0-8)
ICMC 351 Multi-Camera Shooting	4 (0-8-4)
ICMC 352 TV Pre-Production	4 (4-0-8)
ICMC 353 TV Post-Production	4 (0-8-4)

**Track VI: Film Production**

ICMC 313 Film Screenwriting	4 (4-0-8)
ICMC 361 Cinematography	4 (0-8-4)
ICMC 362 Film Pre-Production	4 (4-0-8)
ICMC 363 Film Post-Production	4 (0-8-4)

**Track VII: Marketing**

ICMC 371 Theories of Marketing for Media and Communication	4 (4-0-8)
ICMC 372 TV Marketing and Sales	4 (4-0-8)
ICMC 373 Film Producing	4 (4-0-8)
ICMC 374 Integrated Marketing Communication	4 (4-0-8)

**Additional Major Electives**

ICMC 381 Field Study in Media and Communication	4 (4-0-8)
ICMC 382 Independent Study in Media and Communication	4 (4-0-8)
ICMC 383 Seminar in Media and Communication	4 (4-0-8)
ICMC 384 TV Post-Production II	4 (0-8-4)
ICMC 385 Film Post-Production II	4 (0-8-4)
ICMC 386 Event Management for Media and Communication	4 (4-0-8)
ICMC 387 Theatre Production and Management I	4 (0-8-4)
ICMC 388 Theatre Production and Management II	4 (0-8-4)
ICMC 389 Special Effects Make-up for Television and Film	4 (0-8-4)

**Compulsory Elective**

ICMC 391 Professional Internship in Media and Communication	12 (0-36-12)
ICMC 401 Media and Communication Degree Project Research and Preparation	4 (0-8-4)
ICMC 402 Media and Communication Degree Project I	4 (0-12-4)
ICMC 403 Media and Communication Degree Project II	4 (0-12-4)

**Free Electives**
**8 credits**

Media and Communication students **must select 8 credits** of free electives from **any of the courses** offered by Mahidol University. The choice is subject to the approval of the academic advisor.

The following courses **must not be taken** as free electives:

- ICMA 102 Principles of Mathematics
- ICMA 106 Calculus 1
- ICNS 101 Introduction to Mathematics



ICNS 102 Principles of Mathematics

ICNS 103 Fundamental Mathematics

ICSS 114 Introduction to Economics



# HUMANITIES AND LANGUAGE

Division



# INTERCULTURAL STUDIES AND LANGUAGES PROGRAM

## DEGREES OFFERED

Bachelor of Arts Program in Intercultural Studies and Languages (International Program)

B.A. Intercultural Studies and Languages (International Program)

## CONCENTRATIONS

1. Foreign Language and Culture Concentration (FLC)
2. Critical Studies of English Concentration (CSEL)
3. Ethics, Philosophy and Economics Concentration (EPE)

**Note:** Students can choose not to pursue any particular concentration.

## THE FIELD

The Intercultural Studies Program provides an interdisciplinary and truly global approach to prepare students for a world in which they need to engage and interact in various cultural contexts. The program aims to be innovative in its design and responsive to today's rapidly changing world, while remaining faithful to the ideals of the liberal arts tradition, foremost of which is to promote good global citizenship by fostering cultural appreciation, critical thinking skills, ethical leadership, and creative problem solving. This major brings together diverse aspects of a humanities/ liberal arts education: a broad range of methods, perspectives and challenges are explored in the areas of language, culture, and economics. In doing so, the program aims to foster the analytical and intuitive thinking skills, creativity, communicative facility and ethical awareness that prepare students to be future decision-makers and lifelong learners.

All students in the Intercultural Studies major study a common set of core courses designed to introduce them to theories and methodology in Intercultural Studies in addition to new fields and subfields of various related disciplines. Depending on their interests and abilities, students are encouraged to decide on one of three concentrations with close consultation with their advisor. Regular joint symposiums with faculty and students aim to develop a learning community that encourages knowledge creation and the exchange of ideas between students and instructors in the different orientations. In their final academic year, they are required to conduct, in any two higher-level courses of their choice, an independent research project.

The program while developing competencies that are fundamental to all careers will be of particular benefit to students preparing for graduate studies or further training in the field of humanities, such as in cultural studies, law, art, economics and politics. The strong interdisciplinary approach aims to widen students' intellectual abilities and analytical thinking so that they are competent decision-makers operating on a global sphere.

## CAREER OPPORTUNITY

- Diplomatic Service
- Work in international and non-governmental organizations
- Foreign Embassies
- Foreign service/diplomat
- Journalism and the media
- Higher education both in teaching and administration

## CURRICULUM STRUCTURE

### Intercultural Studies and Language Program

Courses	Credits
General Education Courses	60
Core Courses	40
Major Elective Courses	72
Free Elective Courses	8
<b>Total</b>	<b>180</b>

# COURSE LIST

## General Education

56-60 Credits

### English Communication

12-16 Credits

#### Regular Track

ICME 100 English Resources Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

#### Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

#### 200+ Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

#### Note

*I:* All students are required to take the first three courses (12 credits) in the General Education requirement for English (ICCM104, ICCM105, ICCM106) in order and without interruption beginning in their first trimester of enrollment. Students may then select any 200+ Level English courses to complete their final 4 credits.

*II:* Based on their achievement on the essay portion of the MUIC entrance exam, some students may be required to successfully complete ICME100-English Resources Skills, a non-credit course, before moving on to ICCM104.

*III:* Based on their achievement on the essay portion of the MUIC entrance exam, some students may be placed into the 'Advanced Track' for their General Education requirements in English. These students will be required to complete only 12 credits in English: ICCM111 and ICCM112 in order and any 200+ Level English courses.

### Natural Science

12 Credits

#### Compulsory Courses

ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)
ICNS 101 Introduction to Mathematics	4 (4-0-8)

#### Additional Compulsory Course: Students must take either one of these two courses:

ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)

**Students take one of these courses to fulfill the requirements of Natural Science**

ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)
ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People, and Society	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 131 Fundamental Physics	4 (4-0-8)
ICNS 132 Principles of Physics	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 141 Computer Essentials	4 (3-2-7)
ICNS 142 Introduction to Internet Technology	4 (3-2-7)
ICNS 143 Fundamental of Computer Science	4 (4-0-8)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 211 The Science of Food	4 (3-2-7)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

**Note:** Based on their achievement on the mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS015 Refresher Mathematics and/or ICNS100 Intensive Mathematics, non-credit courses, before moving on to ICNS 101 Introduction to Mathematics, which is a mandatory course for all Intercultural Studies and Language students.

**Humanities**
**12 Credits**
**Compulsory Courses**

ICID 100 Freshman Seminar	0 (1-0-0)
ICHM 103 Introduction to Logic	4 (4-0-8)

**Additional Compulsory Course: Students must take either one of these two courses**

ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)

**Students take one of these courses to fulfill the requirement of Humanities**

\*Students in the **EPE concentration** must NOT take ICHM 205 Politics and Ethics and ICHM 213 Elements of Knowledge Representation as part of their Humanities requirement courses.

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)



ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics *	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation*	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)

**Social Sciences**
**16 credits**
**Compulsory Courses**

ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)

**Students take two of these courses to fulfill the requirements of Social Sciences**

\*Students in the ICCU **Core Courses** must NOT take ICSS 283 International Cultural Studies, ICSS 348 Society, Politics, and Economics of Contemporary Europe and ICSS 221 Thai Society and Thai Culture as part of their Social Science requirement courses.

ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)
ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)

ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)
ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social Change	4 (4-0-8)
<b>Health Science and Physical Education</b>	<b>4 credits</b>
ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-3-1)
ICPE 102 Physical Education: Basketball	1 (0-3-1)
ICPE 103 Physical Education: Golf	1 (0-3-1)
ICPE 105 Physical Education: Swimming	1 (0-3-1)
ICPE 106 Physical Education: Tennis	1 (0-3-1)
ICPE107 Physical Education: Volleyball	1 (0-3-1)
ICPE 109 Physical Education: Social Dance	1 (0-3-1)
ICPE 113 Physical Education: Modern Dance	1 (0-3-1)



ICPE 115 Self Defense	1 (0-3-1)
ICPE 117 Physical Education: Mind and Body	1 (0-3-1)
ICPE 118 Physical Education: American Flag Football	1 (0-3-1)
ICPE 121 Physical Education: Soccer	1 (0-3-1)
ICPE 123 Physical Education: Cycling	1 (0-3-1)
ICPE 124 Selected Topics in Sports	1 (0-3-1)

**Major Courses** **112 credits**

**Core Courses** **40 credits**

ICCU 201 Society, Politics and Economics in Contemporary Asia	4 (4-0-8)
ICCU 202 Introduction to Eastern and Western Art	4 (4-0-8)
ICCU 203 Introduction to Value Studies	4 (4-0-8)
ICCU 204 History of Ideas I	4 (4-0-8)
ICCU 205 History of Ideas II	4 (4-0-8)
ICCU 206 Ethics and Media	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICSO 283 International Cultural Studies	4 (4-0-8)
ICSO 348 Society, Politics and Economics in Contemporary Europe	4 (4-0-8)
ICSS 221 Thai Society and Thai Culture	4 (4-0-8)

**Major Elective Courses** **72 credits**

*1. Foreign Language and Culture Concentration (FLC)*

Students who choose to study one language in depth need to take all ten language courses in progression, commencing in their first trimester of study. These students are required to take Elementary I and II level courses of a different regional language and at least one additional course from the Foreign Language and Culture Focus.

An external evaluation of their respective language proficiency through an independent evaluation body (Goethe Institute, Alliance Française, DELF-Institute, Hanban, Japanese Institute) is required for students in the Foreign Language and Culture concentration. A passing grade of the respective language proficiency test (German, Spanish and French B 1 level, Japanese N 4 level and for Chinese HSK level 4) is necessary for graduating with a B.A. Intercultural Studies (Foreign Language and Culture).

**Compulsory Courses**

ICCU 301 Introduction to Women and Gender	4 (4-0-8)
ICCU 302 Literature and Poetry in Western Culture	4 (4-0-8)
ICCU 303 Literature and Poetry in Eastern Culture	4 (4-0-8)
ICCU 304 The Origin of Language and Culture	4 (4-0-8)

**Elective courses**

ICCU 311 Recurrent Topics in German Literature	4 (4-0-8)
ICCU 312 Recurrent Topics in French Language	4 (4-0-8)
ICCU 313 Contemporary Chinese Literature	4 (4-0-8)
ICCU 314 Contemporary Japanese Literature	4 (4-0-8)
ICCU 315 Literature in Spain	4 (4-0-8)
ICCU 316 Spanish American Literature	4 (4-0-8)
ICCU 317 Comparative Literature and Civilization	4 (4-0-8)
ICCU 350 Independent Project in Humanities and Languages	4 (4-0-8)

**German Language**

ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)
ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-Intermediate German I	4 (4-0-8)
ICLG 212 Pre-Intermediate German II	4 (4-0-8)
ICLG 213 Pre-Intermediate German III	4 (4-0-8)
ICLG 311 Intermediate German I	4 (4-0-8)
ICLG 312 Intermediate German II	4 (4-0-8)
ICLG 313 Intermediate German III	4 (4-0-8)
ICLG 340 German for Business	4 (4-0-8)

**French Language**

ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-Intermediate French I	4 (4-0-8)
ICLF 212 Pre-Intermediate French II	4 (4-0-8)
ICLF 213 Pre-Intermediate French III	4 (4-0-8)
ICLF 311 Intermediate French I	4 (4-0-8)
ICLF 312 Intermediate French II	4 (4-0-8)
ICLF 313 Intermediate French III	4 (4-0-8)
ICLF 340 French for Business	4 (4-0-8)

**Spanish Language**

ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-Intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-Intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-Intermediate Spanish III	4 (4-0-8)
ICLS 311 Intermediate Spanish I	4 (4-0-8)
ICLS 312 Intermediate Spanish II	4 (4-0-8)
ICLS 313 Intermediate Spanish III	4 (4-0-8)
ICLS 340 Spanish for Business	4 (4-0-8)

**Japanese Language**

ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-Intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-Intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-Intermediate Japanese III	4 (4-0-8)
ICLJ 311 Intermediate Japanese I	4 (4-0-8)
ICLJ 312 Intermediate Japanese II	4 (4-0-8)
ICLJ 313 Intermediate Japanese III	4 (4-0-8)
ICLJ 340 Japanese for Business	4 (4-0-8)

**Chinese Language**

ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-Intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-Intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-Intermediate Chinese III	4 (4-0-8)
ICLC 311 Intermediate Chinese I	4 (4-0-8)
ICLC 312 Intermediate Chinese II	4 (4-0-8)
ICLC 313 Intermediate Chinese III	4 (4-0-8)
ICLC 340 Chinese for Business	4 (4-0-8)

*2. Critical Studies of English Concentration (CSEL)*
**Compulsory Courses**

ICCU 301 Introduction to Women and Gender	4 (4-0-8)
ICCU 302 Literature and Poetry in Western Culture	4 (4-0-8)
ICCU 303 Literature and Poetry in Eastern Culture	4 (4-0-8)
ICCU 304 The Origin of Language and Culture	4 (4-0-8)

**Elective Courses**

ICCU 317 Comparative Literature and Civilization	4 (4-0-8)
ICCU 320 Introduction to Literary Criticism	4 (4-0-8)
ICCU 321 Diasporic Literature	4 (4-0-8)
ICCU 322 Literature Topics in Religion, Culture and Gender	4 (4-0-8)
ICCU 323 Language, Power and Culture	4 (4-0-8)
ICCU 325 Popular Culture	4 (4-0-8)
ICCU 326 Research Writing	4 (4-0-8)
ICCU 327 Creative Non-Fiction	4 (4-0-8)
ICCU 328 Language in Society	4 (4-0-8)
ICCU 350 Independent Project in Humanities and Languages	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)

Students in CSEL Concentration must choose minimum 5 courses from the above list of Elective CSEL Courses. To fulfill the total credits in this part (=8 courses), students may choose courses from any elective courses in any ICCU concentration

### 3. Ethics, Philosophy and Economics Concentration (EPE)

#### Compulsory Courses

ICCU 305 Judgment and Decision Making	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICMB 203 Microeconomics	4 (4-0-8)
ICMB 204 Macroeconomics	4 (4-0-8)

#### Elective Courses

ICBE 346 Public Economics	4 (4-0-8)
ICCU 330 Minds and Machines	4 (4-0-8)
ICCU 331 Applied Ethics I: Business Ethics – more than CSR?	4 (4-0-8)
ICCU 332 Applied Ethics II: Development and Environment	4 (4-0-8)
ICCU 333 Intercultural Philosophy	4 (4-0-8)
ICCU 334 Buddhism and the Public Sphere	4 (4-0-8)
ICCU 335 From Modernism to Postmodernism	4 (4-0-8)
ICCU 336 Foundation of Behavioral Economics	4 (4-0-8)
ICCU 350 Independent Project in Humanities and Languages	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICMI 457 International Business Negotiations	4 (4-0-8)

Students in EPE Concentration must choose minimum 5 courses from the above list of Elective EPE Courses. To fulfill the total credits in this part (= 8 more courses), students may choose courses from any elective courses of any ICCU concentration.

### 4. No Concentration

Students who choose not to pursue any particular concentration are expected to take six elective major courses from each of the FLC, CSEL and EPE concentrations, each including any four compulsory courses.

*\*\*\*All the students in the Intercultural Studies and Languages Program (FLC / CSEL / EPE / No Concentration) are required to complete ICCU350 Independent Project in Humanities and Languages in their last year of study under the guidance of a project supervisor from the ICCU Program.\*\*\**

#### Free Elective Courses

**8 Credits**

Intercultural Studies and Language Students **must select 8 credits** of free electives from **any of the courses** offered by Mahidol University. The choice is subject to the approval of the academic advisor.

The following courses **must not be taken** as free electives:

- ICMA 102 Principles of Mathematics
- ICMA 106 Calculus I
- ICNS 102 Principles of Mathematics
- ICNS 103 Fundamental Mathematics
- ICNS 105 Basic Mathematics



**SCIENCE**

Division

# APPLIED MATHEMATICS PROGRAM

## DEGREE OFFERED

Bachelor of Science (Applied Mathematics)

B.Sc. (Applied Mathematics)

## THE FIELD

Mathematics is one of the oldest human disciplines dating back to the earliest civilizations. From its inception, mathematics has proved to be an indispensable tool for understanding the world around us. Mathematics is the language of modern science. It is essential for those who want to understand the important scientific developments of our time. MUIC offers an applied mathematics major that combines the benefits of a well-rounded general education in science and humanities to produce high caliber graduates capable of undertaking graduate studies, secondary school teaching and professions in IT, finance, banking, statistics, and actuarial science. Mathematics is the study of and search for patterns and pervades almost every aspect of life. It plays a fundamental role both in the realm of sciences and in the realm of commerce and finance. It also provides tools and skills we need for dealing with the most abstract concepts. An understanding of mathematics is also useful for students in the social sciences and valuable for anyone interested in the full range of human culture and the development of abstract thought.

## CAREER OPPORTUNITIES

- 1) Graduates can work in research and development in commercial sector and in academia.
- 2) Graduates can work as actuaries in insurance policy design.
- 3) Graduates can work as firm consultants in decision making position.
- 4) Graduates can work in government sector as statisticians and planners.
- 5) Graduates can work as cryptologists in national security department.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	48
Core Science Courses	30
Required Major Courses	68
Elective Major Courses	28
Free Elective Courses	8
<b>TOTAL</b>	<b>182</b>

# COURSE LIST

## Foundation Courses

	Non-credit
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

### Note

*I:* All students must take ICID 100 Freshman Seminar, a non-credit course

*II:* Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

*III:* Students whose Mathematics placement is below ICMA 106 Calculus I or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I or ICMA 151 Statistics for Science I

## General Education

48 Credits

### English Communication

16 Credits

ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 103 Public Speaking	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

## Natural Sciences

8 Credits

### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)
ICGN 103 Essential Statistics	4 (4-0-8)
ICGN 104 Mathematics and Its Contemporary Applications	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)



ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

*Note:\*\* The exceeding credit from GE-Natural Science courses will not be counted as Free Elective credit.\*\**

**Humanities and Languages** **12 Credits**

**Humanities**

• **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

• **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Foreign Languages**

• **German**

ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)

• **Japanese**

ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)

• **French**

ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)

• **Chinese**

ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)
<b>• Spanish</b>	
ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)
<b>• Thai</b>	
ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)
<b>Social Sciences</b>	<b>8 Credits</b>
<b>• Financial, Economic Scientific and Environmental Literacy</b>	
ICGS 101 Accounting for Young Entrepreneurs	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change	4 (4-0-8)
ICGS 103 Economics in Modern Business	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 105 Personal Financial Management	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)
<b>• Global and Multicultural Literacy</b>	
ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)
<b>• Psychological Literacy</b>	
ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)
<b>Physical Education</b>	<b>4 Credits</b>
ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)

ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

## Major Courses

126 credits

### Core Courses

30 credits

ICBI 101 Biology	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICMA 106 Calculus	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICMA 151 Statistics for Science I	4 (4-0-8)
ICPY 101 Physics I	4 (4-0-8)
ICPY 105 Integrated Laboratory in Physics I	2 (0-4-2)

### Major Required Courses

68 credits

ICCS 101 Introduction to Computer Programming	4 (3-2-7)
ICCS 204 Data Structures and Object-Oriented Programming	4 (3-2-7)
ICMA 200 Principles and Mathematical Concepts	4 (4-0-8)
ICMA 214 Ordinary Differential Equations	4 (4-0-8)
ICMA 216 Calculus III A	2 (2-0-4)
ICMA 217 Calculus III B	2 (2-0-4)
ICMA 223 Linear Algebra A	2 (2-0-4)
ICMA 224 Linear Algebra B	2 (2-0-4)
ICMA 242 Discrete Mathematics	4 (4-0-8)
ICMA 253 Statistics for Science II	4 (4-0-8)
ICMA 322 Advanced Calculus	4 (4-0-8)
ICMA 323 Partial Differential Equations	4 (4-0-8)
ICMA 335 Complex Variables	4 (4-0-8)
ICMA 338 Numerical Methods	4 (4-0-8)
ICMA 350 Probability	4 (4-0-8)
ICMA 353 Actuarial Mathematics I	4 (4-0-8)
ICMA 424 Abstract Algebra	4 (4-0-8)
ICMA 445 Seminar in Applied Mathematics	2 (2-0-4)
ICMA 446 Research Project in Applied Mathematics	6 (0-12-6)

### Major Elective Courses

28 credits

**Note I:** Three different tracks, namely Applied Mathematics, Financial Mathematics, and Statistics, are offered to students who want to pursue a specific area of Mathematics. Students are not required to select a track as they can graduate without one. Nevertheless, they

still need to earn at least 28 credits from the Major Elective courses.

The following are the lists of track elective courses to fulfill the requirement of each track:

**Applied Mathematics Track**  
(16 credits)

ICCS 161 Introduction to Data Science	4 (3-2-7)
ICMA 222 Introduction to Mathematical Software	4 (4-0-8)
ICMA 346 Optimization	4 (4-0-8)
ICMA 354 Actuarial Mathematics II	4 (4-0-8)

**Financial Mathematics Track**  
(20 credits)

ICMB 213 Financial Accounting	4 (4-0-8)
ICMB 214 Managerial Accounting	4 (4-0-8)
ICMB 215 Business Finance for Entrepreneurs	4 (4-0-8)
ICMF 316 Financial Management	4 (4-0-8)
ICMF 322 Risk Management and Derivatives	4 (4-0-8)

**Statistics Track**  
(16 credits)

ICCS 161 Introduction to Data Science	4 (3-2-7)
ICMA 344 Time Series Analysis	4 (4-0-8)
ICMA 432 Multivariate Analysis	4 (4-0-8)
ICMA 435 Regression Analysis	4 (4-0-8)

**Major Elective Courses**

**Note I:** The following courses are available as Major Elective courses to all students in Applied Mathematics program

ICCS 161 Introduction to Data Science	4 (3-2-7)
ICMA 222 Introduction to Mathematical Software	4 (4-0-8)
ICMA 344 Time Series Analysis	4 (4-0-8)
ICMA 346 Optimization	4 (4-0-8)
ICMA 354 Actuarial Mathematics II	4 (4-0-8)
ICMA 393 Special Topics in Applied Mathematics I	4 (4-0-8)
ICMA 395 Special Topics in Applied Mathematics II	4 (4-0-8)
ICMA 432 Multivariate Analysis	4 (4-0-8)
ICMA 435 Regression Analysis	4 (4-0-8)
ICMA 484 Special Topics in Applied Mathematics III	4 (4-0-8)
ICMA 485 Special Topics in Applied Mathematics IV	4 (4-0-8)
ICMA 486 Special Topics in Applied Mathematics V	4 (4-0-8)
ICMA 487 Special Topics in Applied Mathematics VI	4 (4-0-8)
ICMA 205 Microeconomics	4 (4-0-8)
ICMA 206 Macroeconomics	4 (4-0-8)
ICMB 213 Financial Accounting	4 (4-0-8)
ICMB 214 Managerial Accounting	4 (4-0-8)
ICMB 215 Business Finance for Entrepreneurs	4 (4-0-8)
ICMF 316 Financial Management	4 (4-0-8)
ICMF 322 Risk Management and Derivatives	4 (4-0-8)

**AND**

No more than 12 credits of Core or Required courses from other majors in Science.

**Free Elective Courses**

**8 credits**

Applied Mathematics students can take any course offered by Mahidol University International College as a free elective, except the GE-Natural Science courses.

# BIOLOGICAL SCIENCES

## PROGRAM

### DEGREE OFFERED

**Bachelor of Science (Biological Sciences)**

**B.Sc. (Biological Sciences)**

There are 2 concentrations:

1. Applied Biology
2. Biomedical Science

### THE FIELD

The Biological Sciences Program at MUIC is a success-oriented track for students to advance into the wide world of life sciences—advanced professional and research degree programs (M.D., D.D.S., D.V.M., Ph.D., M.Sc.) and directly into commerce or education. The curriculum—for a small college environment like MUIC—is exceptionally diverse and flexible, while maintaining interest and challenge for the most discriminating students. Fundamental principles are implicit to the required first to second years. These principles cover every field from environmental science, population biology and regulatory biology to cell and molecular biology. After achieving this firm foundation, students advance into one of two concentrations, Applied Biology or Biomedical Science. Individual programs can be further tailored by following modules within the concentrations. Within Applied Biology there are three modules: Ecology and Conservation, Biotechnology and Bioinformatics. For students pursuing the Biomedical Science concentration, they can choose to emphasize either Biomedical Science itself or the innovative and flexible Health and Wellness module.

The Ecology and Conservation module covers both theoretical and practical aspects of environmental biology. It emphasizes the structure and functioning of diverse tropical ecosystems in the Anthropocene Age, running the gamut from Aquatic and terrestrial to marine. Graduates will possess a profound appreciation of the interconnectedness of natural ecosystems and human endeavors, enabling them to immediately tackle environmental issues or go on for advanced studies.

Biotechnology is a discipline in which technology is applied in the production or modification of molecules, or manipulation of living organisms, to develop useful products, processes or services. Biotechnology encompasses a wide range of fields, including biological science, biochemistry, medicine, agriculture, environmental science and many more. It also includes various technologies, for example, recombinant DNA technology, gene transfer, embryo manipulation and transfer, monoclonal antibody production and fermentation process for the production of various microbial cells and metabolites.

Bioinformatics is a module at the crossroads of computer science and biological sciences. Students may use informatics and programming skills to handle biological data such as DNA or protein sequences as well as their 3D structures. It is a challenge for bioinformaticians to draw meaningful conclusions from the biological data and unravel insights that no other experimental approach may ever provide owing to the limitations of the instrumentation. Bioinformatics extends the knowledge from molecular biology to systems biology and is becoming a much needed field in this -omics and digital age.

Biomedical Science provides an understanding of the human body and its functionality with a view towards treating chronic diseases and active interventions. Graduates are prepared to apply for medical or dental school, or to pursue professions allied with medical research including areas such as human anatomy and physiology, pharmacology and toxicology, pathobiology, neurobiology, epidemiology and tropical medicine.

In the Health and Wellness Science module, graduates interested in lifetime health maintenance and issues, will have studied the

body and the mind through courses such as Nutrition and Dietetics, Health Psychology, and Community Health. Graduates can pursue advanced studies or careers in nutrition and fitness, personal training, health consulting, and will be well-equipped to understand the health in its societal and environmental context.

## CAREER OPPORTUNITIES

- 1) Graduates can work as teaching assistants in the field of Biological Sciences at any academic institutes or universities.
- 2) Graduates can pursue a teaching career as primary- and secondary-school teachers in the field of Biological Sciences at any international schools.
- 3) Graduates can work in research and development departments of any company or manufacturer dealing in biological products.
- 4) Graduates can work in quality control or quality assurance positions.
- 5) Graduates can work as research assistants in research institutes or on research programs/projects either in Thailand or abroad.
- 6) Graduates can work in scientific instruments trading and services in both private and governmental sectors.
- 7) Graduates can work as a bioinformaticist in any institutes nationally and internationally
- 8) Graduates can work in customer relations departments for biological or biomedical product companies.
- 9) Graduates can work in customer relations departments for private hospitals that require personnel with good a command of English.
- 10) Graduates can continue their studies for a higher degree in any field of biological sciences.
- 11) Graduates can continue their studies for a professional degree in the related fields such as medicine, dentistry, veterinary science, pharmacy, etc.
- 12) Graduates can become the owner of companies that sell products and/or services in the field of biological sciences.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	40
Core Science Courses	38
Major Core Courses	32
Required Major Courses	40
Elective Major Courses	16
Free Elective Courses	8
<b>Total</b>	<b>174</b>

# COURSE LIST

## Foundation Courses

	Non-credit
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

### Note

*I:* All students must take ICID 100 Freshman Seminar, a non-credit course.

*II:* Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

*III:* Students whose Mathematics placement is below ICMA 106 Calculus I or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I or ICMA 151 Statistics for Science I

## General Education

40 Credits

### English Communication

16 Credits

ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 103 Public Speaking	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

### Natural Sciences

4 Credits

#### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)
ICGN 103 Essential Statistics	4 (4-0-8)
ICGN 104 Mathematics and Its Contemporary Applications	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)

ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

**Humanities and Languages**

**8 Credits**

**Humanities**

• **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

• **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Foreign Languages**

• **German**

ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)

• **Japanese**

ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)

• **French**

ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)



- **Chinese**

ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)

- **Spanish**

ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)

- **Thai**

ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)

**Social Sciences**
**8 Credits**

- **Financial, Economic Scientific and Environmental Literacy**

ICGS 101 Accounting for Young Entrepreneurs	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change	4 (4-0-8)
ICGS 103 Economics in Modern Business	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 105 Personal Financial Management	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)

- **Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)

- **Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**Physical Education**
**4 Credits**

ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)

ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

### Major Courses

**132 credits**

### Core Science Courses

**38 credits**

ICBI 101 Biology *	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Sciences I*	2 (0-4-2)
ICBI 103 Biology II*	4 (4-0-8)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 211 General Chemistry II	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICMA 106 Calculus I	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICPY 101 Physics I	4 (4-0-8)
ICPY 102 Physics II	4 (4-0-8)
ICPY 105 Integrated Laboratory in Physics I	2 (0-4-2)

**Note:** \* ICBI 101 Biology, ICBI 102 Integrated laboratory in Biological Sciences I and ICBI 103 Biology II can be bypassed (with credits rewarded) if students have already taken A-level or AP with grade A or A\* of equivalent courses that can be transferred according to MU's regulations.

### Major Core Courses

**32 credits**

ICBI 207 Ethics for Bioscience	4 (4-0-8)
ICBI 214 General Microbiology	4 (4-0-8)
ICBI 271 General Microbiology Laboratory	2 (0-4-2)
ICBI 215 General Biochemistry	4 (4-0-8)
ICBI 272 General Biochemistry Laboratory	2 (0-4-2)
ICCH 221 Organic Chemistry I	4 (4-0-8)
ICCH 390 Organic Chemistry Laboratory Techniques	2 (0-4-2)
ICMA 151 Statistics for Science I	4 (4-0-8)
ICMA 252 Biological Statistics Laboratory	2 (0-4-2)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)

### Required Courses

**40 credits**

ICBI 211 Genetics and Molecular Biology I	4 (4-0-8)
ICBI 216 Cell Biology	4 (4-0-8)
ICBI 221 Animal Biology **	4 (3-2-7)
ICBI 231 Plant Biology **	4 (3-2-7)
ICBI 262 Practical Field Ecology and Conservation	4 (3-2-7)

ICBI 380 Introduction to Systems Biology and Bioinformatics	4 (4-0-8)
ICBI 381 Evolutionary Biology	4 (4-0-8)
ICBI 382 Systematic Biology and Biodiversity	4 (4-0-8)
ICBI 464 Entrepreneurship and Innovation in Science**	4 (4-0-8)
ICBI 465 Internship in Biological Sciences **	4 (0-12-0)
ICBI 499 Research Project in Biological Science	8 (0-16-8)

**Note I:** \*\* Students have the choice of completing either or of the following subjects to fulfill the credit requirement of the required courses

- ICBI 221 Animal biology OR ICBI 231 Plant biology
- ICBI 464 Entrepreneurship and Innovation OR ICBI 465 Internship in Biological Sciences

**Note II:** Both ICBI 221 and ICBI 231 are recommended for students undertaken the Biotechnology module.

**Note III:** ICBI 465 is required for students undertaken the Ecology and Conservation module

### Major Elective Courses

at least 16 credits

Four different modules within two concentrations are offered to students who are pursuing a specific area of Biological Sciences. However, students are not required to select a module as they can graduate without any concentration. Nevertheless, they still need to earn at least 26 credits from the Major Elective courses, of which 14 credits will be from courses in any one module and 12 credits from at least two other modules.

### Applied Biology Concentration

#### The Ecology and Conservation Module

(16 credits)

Students under this module are required to take ICBI 443 Fungal Ecology and 12 credits from the other courses in this module.

ICBI 385 Freshwater Ecology and Conservation	4 (4-0-8)
ICBI 386 Practical Freshwater Ecology and Conservation	2 (0-4-2)
ICBI 387 Terrestrial Ecology and Conservation	4 (4-0-8)
ICBI 388 Practical Terrestrial Ecology and Conservation	2 (0-4-2)
ICBI 440 Marine Ecology and Conservation	4 (4-0-8)
ICBI 442 Practical Marine Ecology and Conservation	2 (0-4-2)
ICBI 443 Fungal Ecology*	4 (3-2-7)

\*Required Course

#### The Biotechnology Module

(26 credits)

Students under this module are required to take 20 credits from this module and 6 credits from other modules.

ICBI 315 Microbial Physiology and Genetics	4 (4-0-8)
ICBI 316 Environmental Microbiology	4 (3-2-7)
ICBI 372 Utilization of Water and Wastewater Treatment	4 (3-2-7)
ICBI 401 Genetics and Molecular Biology II	4 (4-0-8)
ICBI 404 Molecular Biology Laboratory	2 (0-4-2)
ICBI 414 Industrial Microbiology	4 (4-0-8)
ICBI 415 Biotechnology	4 (4-0-8)
ICBI 432 Plant Biotechnology	4 (4-0-8)
ICBI 433 Fermentation Technology	4 (4-0-8)
ICBI 434 Food Biotechnology	4 (4-0-8)

ICBI 435 Molecular Techniques in Biotechnology	4 (4-0-8)
ICBI 436 Industrial Enzymology	4 (3-2-7)
ICBI 437 Current Issues in Biotechnology	2 (2-0-4)
ICBI 461 Cell Technology	4 (3-2-7)
ICCH 222 Organic Chemistry II	4 (4-0-8)
ICCH 311 Analytical Chemistry	4 (3-2-7)
ICCH 316 Modern Methods of Analysis	4 (3-2-7)

#### The Bioinformatics Module

(32 credits)

Students under this module are required to take ICBI 325, ICCS 101, ICCS 161, ICCS 204, ICCS 205 and ICCS 206, and additional 8 credits from the other courses in this module.

ICBI 325 Special Topics in Bioinformatics and Molecular Genetics*	4 (4-0-8)
ICCS 101 Introduction to Computer Programming*	4 (3-2-7)
ICCS 161 Introduction to Data Science*	4 (3-2-7)
ICCS 204 Data Structure and Object-Oriented Programming*	4 (3-2-7)
ICCS 205 Numerical Computation*	4 (4-0-8)
ICCS 206 Discrete Mathematics*	4 (2-4-6)
ICCS 312 Algorithms and Tractability	4 (4-0-8)
ICCS 361 Data Mining	4 (4-0-8)
ICCS 461 Machine Learning	4 (4-0-8)

\*Required Course

#### Biomedical Science Concentration

#### The Medical Science Module

(30 credits)

Students under this module are required to take ICBI 305, ICBI 311, ICBI 401, ICBI 404, ICBI 405, ICCH 222 and 8 credits of any other courses under this module.

ICBI 204 Developmental Biology	4 (4-0-8)
ICBI 301 Functional Histology	4 (3-2-7)
ICBI 303 Basic Immunology	4 (4-0-8)
ICBI 305 Human Anatomy I*	4 (2-4-6)
ICBI 306 Human Anatomy II	4 (2-4-6)
ICBI 307 Nutrition and Dietetics	4 (4-0-8)
ICBI 309 Pathobiology	4 (3-2-7)
ICBI 311 Human Physiology*	4 (3-2-7)
ICBI 324 Introduction to Medical Toxicology	4 (4-0-8)
ICBI 328 Essential Pharmacology	4 (4-0-8)
ICBI 332 Medical Microbiology	4 (3-2-7)
ICBI 341 Neurobiology	4 (3-2-7)
ICBI 391 Health Psychology	4 (4-0-8)
ICBI 401 Genetics and Molecular Biology II*	4 (4-0-8)
ICBI 402 Epidemiology	4 (3-2-7)
ICBI 403 Introduction to Tropical Medicine	4 (4-0-8)
ICBI 404 Molecular Biology Laboratory*	2 (0-4-2)
ICBI 405 Community Health*	4 (3-2-7)
ICBI 406 Ergonomics	2 (2-0-4)

ICBI 407 Occupational Health and Safety	4 (4-0-8)
ICBI 411 Psychopathology	4 (4-0-8)
ICCH 222 Organic Chemistry II*	4 (4-0-8)
<i>*Required Course</i>	

**The Health and Wellness Science module  
(28 credits)**

Students under this module are required to take ICBI 307, ICBI 391, ICBI 405 and 16 credits of any courses under this module.

ICBI 204 Developmental Biology	4 (4-0-8)
ICBI 301 Functional Histology	4 (3-2-7)
ICBI 305 Human Anatomy I	4 (2-4-6)
ICBI 306 Human Anatomy II	4 (2-4-6)
ICBI 307 Nutrition and Dietetics*	4 (4-0-8)
ICBI 309 Pathobiology	4 (3-2-7)
ICBI 311 Human Physiology	4 (3-2-7)
ICBI 328 Essential Pharmacology	4 (4-0-8)
ICBI 324 Introduction to Medical Toxicology	4 (4-0-8)
ICBI 332 Medical Microbiology	4 (3-2-7)
ICBI 341 Neurobiology	4 (3-2-7)
ICBI 391 Health Psychology*	4 (4-0-8)
ICBI 401 Genetics and Molecular Biology II	4 (4-0-8)
ICBI 402 Epidemiology	4 (3-2-7)
ICBI 403 Introduction to Tropical Medicine	4 (4-0-8)
ICBI 404 Molecular Biology Laboratory	2 (2-0-4)
ICBI 405 Community Health*	4 (3-2-7)
ICBI 406 Ergonomics	2 (2-0-4)
ICBI 407 Occupational Health and Safety	4 (4-0-8)
ICBI 411 Psychopathology	4 (4-0-8)
ICCH 222 Organic Chemistry II	4 (4-0-8)
ICPY 496 Biophysics	4 (4-0-8)
<i>*Required Course</i>	

**Free Elective Courses**

**8 credits**

Biological Sciences students can take any course offered by Mahidol University as a free elective, except the following

- ICGN 107 The Chemistry of everyday life 4 (4-0-8)
- ICGN 111 Physics for CEO 4 (4-0-8)
- ICGN 102 Essential Mathematics 4 (4-0-8)
- ICGN 103 Essential Statistics 4 (4-0-8)
- ICGN 104 Mathematics and its contemporary applications 4 (4-0-8)

# CHEMISTRY

## PROGRAM

### DEGREES OFFERED

**Bachelor of Science (Chemistry)**  
**B.Sc. (Chemistry)**

There are 2 tracks:

1. Chemistry
2. Cosmetic Science

### THE FIELD

*"Imagine a world of possibilities when you know its molecular framework."*

Chemistry is one of the most versatile branches of science. Chemistry is sometimes called "the central science", because it provides an important connection between physical sciences with life sciences and applied sciences. The applications of chemistry reach far into the fields of cosmetics, foods, drugs, petroleum, materials and nanotechnology.

The Chemistry Program at Mahidol University International College reflects and is built upon the changes that have occurred in the discipline over the last few decades. Chemistry majors are taught with full rigor the essential and key subjects such as analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, physical chemistry and senior project in chemistry.

The elective courses in the Chemistry Program offer the Chemistry students the opportunity to shape their own track of preferred courses after completing the core and required chemistry courses. In the elective courses, we offer two tracks, which are cosmetic science and chemistry.

### CAREER OPPORTUNITIES

Graduates of the international bachelor chemistry program can find employment in the following roles:

- 1) Scientist/researcher/teacher in private sector and government department.
- 2) Quality control or quality assurance for local and international chemical, petrochemical, pharmaceutical and cosmetic science manufacturing and related industries
- 3) Customer relations or technical-support in sales and marketing team for chemical, petrochemical, pharmaceutical and cosmetic science manufacturing and related industries
- 4) Business owner or regional representative of applied chemical and cosmetic industries.

### CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	44
Core Courses	42
Required Courses	62
Track Required Courses	16
Track Elective Courses	12
Free Elective Courses	8
<b>Total</b>	<b>184</b>

# COURSE LIST

## Foundation Courses

	<b>Non-credit</b>
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

### Note

- I:* All students must take ICID 100 Freshman Seminar, a non-credit course.
- II:* Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I
- III:* Students whose Mathematics placement is below ICMA 106 Calculus I or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I or ICMA 151 Statistics for Science I

## General Education

**44 Credits**

### English Communication

**16 Credits**

ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 103 Public Speaking	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

### Natural Sciences

**4 Credits**

#### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)
ICGN 103 Essential Statistics	4 (4-0-8)
ICGN 104 Mathematics and Its Contemporary Applications	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)



ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)
<b>• ICT and Digital Literacy</b>	
ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)
<b>Humanities and Languages</b>	<b>12 Credits</b>
<b>Humanities</b>	
<b>• Logical and Ethical Literacy</b>	
ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)
<b>• Arts and Media Literacy</b>	
ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)
<b>Foreign Languages</b>	
<b>• German</b>	
ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)
<b>• Japanese</b>	
ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)
<b>• French</b>	
ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)
<b>• Chinese</b>	
ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)

- **Spanish**

ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)

- **Thai**

ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)

**Social Sciences**
**8 credits**

- **Financial, Economic Scientific and Environmental Literacy**

ICGS 101 Accounting for Young Entrepreneurs	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change	4 (4-0-8)
ICGS 103 Economics in Modern Business	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 105 Personal Financial Management	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)

- **Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)

- **Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**Physical Education**
**4 Credits**

ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)

ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)
<b>Chemistry Major Courses</b>	<b>132 credits</b>
<b>Chemistry Core Courses</b>	<b>42 credits</b>
ICBI 101 Biology	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICBI 103 Biology II	4 (4-0-8)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry	2 (0-4-2)
ICMA 106 Calculus	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICPY 101 Physics	4 (4-0-8)
ICPY 102 Physics II	4 (4-0-8)
ICPY 105 Integrated Laboratory in Physics I	2 (0-4-2)
ICCH 309 Scientific Research and Presentations	4 (4-0-8)
ICMA 151 Statistics for Science I	4 (4-0-8)
<b>Chemistry Required Courses</b>	<b>62 credits</b>
ICCH 211 General Chemistry II	4 (4-0-8)
ICCH 221 Organic Chemistry I	4 (4-0-8)
ICCH 222 Organic Chemistry II	4 (4-0-8)
ICCH 311 Analytical Chemistry	4 (3-2-7)
ICCH 316 Modern Methods of Analysis	4 (3-2-7)
ICCH 321 Organic Spectroscopy	4 (4-0-8)
ICCH 329 Integrated Laboratory Techniques in Chemistry II	2 (0-4-2)
ICCH 333 Physical Chemistry I	4 (4-0-8)
ICCH 371 Biochemistry I	4 (4-0-8)
ICCH 372 Biochemistry II	4 (4-0-8)
ICCH 373 Biochemistry Laboratory	2 (0-4-2)
ICCH 390 Organic Chemistry Laboratory Techniques	2 (0-4-2)
ICCH 441 Inorganic Chemistry I	4 (4-0-8)
ICCH 445 Integrated Laboratory Techniques in Chemistry III	2 (0-4-2)
ICCH 446 Chemical Unknown Detective	2 (0-4-2)
ICCH 454 Seminar in Chemistry	2 (2-0-4)
ICCH 455 Senior Project in Chemistry	6 (0-12-6)
ICCS 161 Introduction to Data Science	4 (3-2-7)
<b>Tracks Required Courses</b>	<b>16 credits</b>
<b>Chemistry Track</b>	
ICCH 322 Advanced Organic Chemistry	4 (4-0-8)

ICCH 334 Physical Chemistry II	4 (4-0-8)
ICCH 391 Material Science	4 (4-0-8)
ICCH 442 Inorganic Chemistry II	4 (4-0-8)

#### Cosmetic Science Track

ICCH 393 Dermatology	4 (4-0-8)
ICCH 394 Colloid and Emulsion Chemistry	4 (4-0-8)
ICCH 395 Cosmetic Science	4 (3-2-7)
ICCH 396 Pharmaceutical Science	4 (4-0-8)

**Note 1:** Students in consultation with their academic advisers must declare their track (Chemistry or Cosmetic Science) to the division secretary by the end of their third regular trimester. Changes at later date are allowed at the end of each regular trimester by the approval of the PD of Chemistry.

#### Track Elective Courses 12 credits

*\*\*Available to both Tracks\*\**

ICBI 211 Genetics and Molecular Biology I	4 (3-2-7)
ICBI 380 Introduction to System Biology and Bioinformatics	4 (4-0-8)
ICCH 336 Computational Chemistry	4 (4-0-8)
ICCH 337 Applied Computational Methods and Cheminformatics	4 (4-0-8)
ICCH 381 Mathematics for Chemists	4 (4-0-8)
ICCH 425 Current Topics in Organic Chemistry I	4 (4-0-8)
ICCH 426 Current Topics in Organic Chemistry II	4 (4-0-8)
ICCH 427 Current Topics in Applied Chemistry I	4 (4-0-8)
ICCH 428 Current Topics in Applied Chemistry II	4 (4-0-8)
ICCH 429 Current Topics in Physical Chemistry	4 (4-0-8)
ICCH 430 Current Topics in Inorganic Chemistry	4 (4-0-8)
ICCH 433 Current Topics in Biochemistry	4 (4-0-8)
ICFS 314 Food Analysis	4 (3-2-7)
ICPY 496 Biophysics	4 (4-0-8)

#### For Chemistry Track

Cosmetic Science Track Required Courses can be elective courses

#### For Cosmetic Science Track

Chemistry Track Required Courses can be elective courses

#### Free Elective Courses 8 credits

Chemistry students can take any course offered by Mahidol University International College as a free elective, except the GE-Natural Science courses.

*Note: \*\*The exceeding credit from GE-Natural Science will not be counted as Free Elective Credit.\*\**

# COMPUTER ENGINEERING PROGRAM

## DEGREE OFFERED

Bachelor of Engineering (Computer Engineering)

B.Eng. (Computer Engineering)

## THE FIELD

Computer Engineering is defined as the discipline that embodies the science and technology of design, construction, implementation and maintenance of software and hardware components of modern computing systems and computer controlled equipment. Computer engineering has traditionally been viewed as a combination of both computer science and electrical engineering. It has evolved over the past three decades as a separate, although intimately related, discipline. Computer engineering is solidly grounded in the theories and principles of computing, mathematics, science and engineering; it applies these theories and principles to solve technical problems through the design of computing hardware, software, networks and processes.

Technological advances and innovation continue to drive computer engineering. There is now a convergence of several established technologies (such as television, computer and networking technologies) resulting in widespread and ready access to information on an enormous scale. This has created many opportunities and challenges for computer engineers. This convergence of technologies and the associated innovation lie at the heart of economic development and the future of many organizations. The situation bodes well for a successful career in computer engineering.

## CAREER OPPORTUNITIES

Increasingly, computer engineers are involved in the design of computer-based systems to address highly specialized and specific application needs. Computer engineers work in most industries, including the computer, aerospace, telecommunications, power production, manufacturing, defense and electronics industries. They design high-tech devices ranging from tiny microelectronic integrated-circuit chips to powerful systems that utilize those chips and efficient telecommunication systems that interconnect those systems. A wide array of complex technological systems, such as power generation and distribution systems and modern processing and manufacturing plants, rely on computer systems developed and designed by computer engineers.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Course	48
Core Courses	41
Required Major Courses	65
Elective Major Courses	24
Free Elective Courses	8
<b>Total</b>	<b>186</b>

# COURSE LIST

## General Education Courses 48 credits

### English Communication 12 - 16 credits

#### Regular Track

ICME 100 English Resource Skills	0 (4-0-0)
ICCM 104 Intermediate English Communication I	4 (4-0-8)
ICCM 105 Intermediate English Communication II	4 (4-0-8)
ICCM 106 Intermediate English Communication III	4 (4-0-8)

#### Advanced Track

ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)

#### 200+Level Courses

ICCM 202 Exploring Global Realities	4 (4-0-8)
ICCM 203 Introduction to Literary Analysis	4 (4-0-8)
ICCM 204 Creative Writing	4 (4-0-8)
ICEG 232 Advanced Oral Communication	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	4 (4-0-8)
ICEG 342 Diverse English Speaking Cultures	4 (4-0-8)
ICEG 344 Language and Culture	4 (4-0-8)
ICEG 355 The Story of English	4 (4-0-8)
ICEG 461 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICEG 463 Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG 484 First and Second Language Development	4 (4-0-8)

#### Note:

- I. Based on their achievement on the essay portion of the MUIC entrance exam, some students are placed in either 'Regular Track' or 'Advanced Track' for their General Education requirement in English.
- II. Students in 'Intermediate Track' are required to take the first 12 credits in ICCM 104, ICCM 105, and ICCM 106 in order and without interruption, beginning in their first trimester of enrollment. Then select any 200+ level English course to complete their final 4 credits.
- III. Students in 'Advanced Track' will be required to take the first 8 credits in ICCM 111 and ICCM 112 in order and without interruption as soon as the courses are offered. Then choose one course from 200+ level to complete their final 4 credits.
- IV. Some students may be required to successfully complete ICME 100 English Resource Skills, a non-credit course, before moving on to ICCM 104.

### Natural Sciences 12 credits

ICNS 015 Refresher Mathematics	0 (4-0-0)
ICNS 100 Intensive Mathematics	0 (4-0-0)

#### \*Mandatory course for Computer Engineering students

ICNS 102 Principles of Mathematics	4 (4-0-8)
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- Students take the following courses to fulfill the requirement of Natural Science

ICNS 112 Integrated Biology	4 (4-0-8)
ICNS 114 The Science of the Human Body	4 (4-0-8)

ICNS 115 Hominid Evolution and Primate Society	4 (4-0-8)
ICNS 116 Mushrooms, Molds and Mankind	4 (4-0-8)
ICNS 117 Plants, People and Society	4 (4-0-8)
ICNS 122 Principles of Chemistry	4 (4-0-8)
ICNS 133 Introduction to Astronomy	4 (3-2-7)
ICNS 152 Southeast Asian Ecology	4 (3-2-7)
ICNS 153 Ecosystems and Natural Resources	4 (3-2-7)
ICNS 154 Science, Technology and Environment	4 (4-0-8)
ICNS 161 General Geology	4 (3-2-7)
ICNS 171 The Scientific Approach and Society	4 (3-2-7)
ICNS 211 The Science of Food	4 (4-0-8)
ICNS 212 Essentials of the Food Industry	4 (4-0-8)
ICNS 255 Essentials of Marine Life	4 (3-2-7)
ICNS 256 Sustainable Development	4 (4-0-8)
ICNS 257 Environmental Issues: Past, Present and Future	4 (4-0-8)

**Note:** Based on their achievement on the Mathematics portion of the MUIC entrance exam, some students may be required to successfully complete ICNS 015 Refresher Mathematics and/or ICNS 100 Intensive Mathematics, non-credit courses, before moving on to ICNS 102 Principles of Mathematics, which is a mandatory course for Computer Engineering students.

## Humanities

8 credits

### Compulsory Humanities Courses

ICID 100 Freshman Seminar*	0 (1-0-0)
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*\*ONE of the six available compulsory Humanities courses*

ICHM 101 Introduction to Philosophy	4 (4-0-8)
ICHM 103 Introduction to Logic	4 (4-0-8)
ICHM 106 Moral and Ethical Studies	4 (4-0-8)
ICHM 107 Introduction to Asian Philosophy	4 (4-0-8)
ICHM 140 Elementary Art Theory	4 (4-0-8)
ICHM 225 The Western Classical Ideal	4 (4-0-8)

• Students take the following course to fulfill the requirement of Humanities courses

ICHM 105 Music Appreciation	4 (4-0-8)
ICHM 141 Art Appreciation I	4 (4-0-8)
ICHM 142 Art Appreciation II	4 (4-0-8)
ICHM 143 Introduction to Photography	4 (2-4-6)
ICHM 144 Intermediate Photography	4 (4-0-8)
ICHM 202 Intermediate Logic	4 (4-0-8)
ICHM 205 Politics and Ethics	4 (4-0-8)
ICHM 206 Ethics and Technology	4 (4-0-8)
ICHM 212 The Enlightenment in European Literature	4 (4-0-8)
ICHM 213 Elements of Knowledge Representation	4 (4-0-8)
ICHM 218 Film Studies	4 (4-0-8)
ICHM 223 Thai Arts	4 (4-0-8)
ICHM 241 Introduction to Drawing	4 (2-4-6)
ICHM 242 Intermediate Drawing	4 (2-4-6)
ICML 101 Elementary German I	4 (4-0-8)
ICML 102 Elementary German II	4 (4-0-8)



ICML 103 Elementary German III	4 (4-0-8)
ICLG 211 Pre-intermediate German I	4 (4-0-8)
ICLG 212 Pre-intermediate German II	4 (4-0-8)
ICLG 213 Pre-intermediate German III	4 (4-0-8)
ICML 111 Elementary Japanese I	4 (4-0-8)
ICML 112 Elementary Japanese II	4 (4-0-8)
ICML 113 Elementary Japanese III	4 (4-0-8)
ICLJ 211 Pre-intermediate Japanese I	4 (4-0-8)
ICLJ 212 Pre-intermediate Japanese II	4 (4-0-8)
ICLJ 213 Pre-intermediate Japanese III	4 (4-0-8)
ICML 121 Elementary French I	4 (4-0-8)
ICML 122 Elementary French II	4 (4-0-8)
ICML 123 Elementary French III	4 (4-0-8)
ICLF 211 Pre-intermediate French I	4 (4-0-8)
ICLF 212 Pre-intermediate French II	4 (4-0-8)
ICLF 213 Pre-intermediate French III	4 (4-0-8)
ICML 131 Elementary Chinese I	4 (4-0-8)
ICML 132 Elementary Chinese II	4 (4-0-8)
ICML 133 Elementary Chinese III	4 (4-0-8)
ICLC 211 Pre-intermediate Chinese I	4 (4-0-8)
ICLC 212 Pre-intermediate Chinese II	4 (4-0-8)
ICLC 213 Pre-intermediate Chinese III	4 (4-0-8)
ICML 141 Elementary Spanish I	4 (4-0-8)
ICML 142 Elementary Spanish II	4 (4-0-8)
ICML 143 Elementary Spanish III	4 (4-0-8)
ICLS 211 Pre-intermediate Spanish I	4 (4-0-8)
ICLS 212 Pre-intermediate Spanish II	4 (4-0-8)
ICLS 213 Pre-intermediate Spanish III	4 (4-0-8)
ICML 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICML 161 Elementary Thai I	4 (4-0-8)
ICML 162 Elementary Thai II	4 (4-0-8)
ICML 163 Elementary Thai III	4 (4-0-8)
ICML 171 Elementary Indonesian I	4 (4-0-8)
ICML 172 Elementary Indonesian II	4 (4-0-8)
ICML 173 Elementary Indonesian III	4 (4-0-8)
ICML 181 Elementary Burmese I	4 (4-0-8)
ICML 182 Elementary Burmese II	4 (4-0-8)
ICML 183 Elementary Burmese III	4 (4-0-8)
ICML 191 Elementary Cambodian I	4 (4-0-8)
ICML 192 Elementary Cambodian II	4 (4-0-8)
ICML 193 Elementary Cambodian III	4 (4-0-8)

**Note I:** All students must take ICID 100 Freshman Seminar, a non-credit course.

**Note II:** Computer Engineering students must take at least ONE of the six available compulsory Humanities courses: ICHM 101, ICHM 103, ICHM 106, ICHM 107, ICHM 140, or ICHM 225.

#### Social Sciences

**8 credits**

ICSS 112 Introduction to Psychology	4 (4-0-8)
ICSS 113 Introduction to Sociology	4 (4-0-8)
ICSS 114 Introduction to Economics	4 (4-0-8)

ICSS 115 Introduction to Physical Anthropology	4 (4-0-8)
ICSS 116 Introduction to Political Science	4 (4-0-8)
ICSS 117 Introduction to Social Anthropology	4 (4-0-8)
ICSS 118 Introduction to Mass Communications	4 (4-0-8)
ICSS 119 Introduction to International Studies	4 (4-0-8)
ICSS 121 Southeast Asian Studies	4 (4-0-8)
ICSS 133 Introduction to European History	4 (4-0-8)
ICSS 135 Introduction to Human Geography	4 (4-0-8)
ICSS 136 Religious Experience and Traditions	4 (4-0-8)
ICSS 137 Introduction to Archaeology	4 (4-0-8)
ICSS 139 Tourism Geography	4 (4-0-8)
ICSS 202 Social Institutions	4 (4-0-8)
ICSS 203 Globalization and the Modern World	4 (4-0-8)
ICSS 204 World History A (c. 1400-1763)	4 (4-0-8)
ICSS 205 World History B (c. 1763-1914)	4 (4-0-8)
ICSS 206 World History C (c. 1914-1945)	4 (4-0-8)
ICSS 207 World History D (c. 1945-2000)	4 (4-0-8)
ICSS 211 Regional Geography of Southeast Asia	4 (4-0-8)
ICSS 212 History of Southeast Asia in the Modern Period	4 (4-0-8)
ICSS 213 Southeast Asian Political Systems	4 (4-0-8)
ICSS 214 Southeast Asian Women	4 (4-0-8)
ICSS 215 Southeast Asian Religious and Cultural Traditions	4 (4-0-8)
ICSS 216 Introduction to the Economics of Southeast Asia	4 (4-0-8)
ICSS 221 Thai Society and Thai Culture	4 (4-0-8)
ICSS 222 Thai History	4 (4-0-8)
ICSS 231 The History of East Asia in the Modern Age	4 (4-0-8)
ICSS 232 Introduction to the Civilizations of East Asia I	4 (4-0-8)
ICSS 233 Introduction to the Civilizations of East Asia II	4 (4-0-8)
ICSS 234 The History and Culture of South Asia up to c.1500	4 (4-0-8)
ICSS 235 The History and Culture of South Asia since c.1500	4 (4-0-8)
ICSS 237 Introduction to Australasian History since 1770	4 (4-0-8)
ICSS 238 Africa since 1800	4 (4-0-8)
ICSS 239 The Middle East Since 1800	4 (4-0-8)
ICSS 241 Latin America since 1800	4 (4-0-8)
ICSS 243 North America History c. 1763-1900	4 (4-0-8)
ICSS 244 North America History since 1900	4 (4-0-8)
ICSS 246 Europe History since 1945	4 (4-0-8)
ICSS 247 The European Union	4 (4-0-8)
ICSS 250 Introduction to History and Systems of Psychology	4 (4-0-8)
ICSS 251 Developmental Psychology I	4 (4-0-8)
ICSS 252 Developmental Psychology II	4 (4-0-8)
ICSS 253 Social Psychology	4 (4-0-8)
ICSS 254 Psychological Approaches to Personality	4 (4-0-8)
ICSS 255 Abnormal Psychology	4 (4-0-8)
ICSS 256 Introduction to Industrial and Organizational Psychology	4 (4-0-8)
ICSS 257 Introduction to Educational Psychology	4 (4-0-8)
ICSS 258 Introduction to Cross-Cultural Psychology	4 (4-0-8)
ICSS 259 Russia and the Soviet Union up to 1825	4 (4-0-8)
ICSS 260 Russia and the Soviet Union Since 1825	4 (4-0-8)
ICSS 271 An Introduction to International Relations	4 (4-0-8)

ICSS 272 An Introduction to Comparative Political Systems	4 (4-0-8)
ICSS 303 The Early History of Southeast Asia	4 (4-0-8)
ICSS 307 A Historical Introduction to the World Economy	4 (4-0-8)
ICSS 311 Introduction to International Politics in Southeast Asia	4 (4-0-8)
ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSS 315 Thai Economic History	4 (4-0-8)
ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSS 332 Introduction to Human Rights	4 (4-0-8)
ICSS 334 Economic Problem in Southeast Asia	4 (4-0-8)
ICSS 335 SEA Arts I	4 (4-0-8)
ICSS 337 Introduction to Southeast Asian Dance and Theater	4 (4-0-8)
ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behavior	4 (4-0-8)
ICSS 355 Drug Use and Behavior	4 (4-0-8)
ICSS 361 Economic Geography	4 (4-0-8)
ICSS 362 Introduction to Global Resources	4 (4-0-8)
ICSS 363 Introduction to Population and Migration Issues	4 (4-0-8)
ICSS 374 Introduction to International Organization	4 (4-0-8)
ICSS 375 Introduction to Democracy as a Political System	4 (4-0-8)
ICSS 382 Introduction to Global Media and Social change	4 (4-0-8)

#### Health Science and Physical Education

**4 credits**

ICHE 101 Health Education	2 (2-0-4)
ICPE 101 Physical Education: Badminton	1 (0-3-1)
ICPE 102 Physical Education: Basketball	1 (0-3-1)
ICPE 103 Physical Education: Golf	1 (0-3-1)
ICPE 105 Physical Education: Swimming	1 (0-3-1)
ICPE 106 Physical Education: Tennis	1 (0-3-1)
ICPE 107 Physical Education: Volleyball	1 (0-3-1)
ICPE 109 Physical Education: Social Dance	1 (0-3-1)
ICPE 113 Physical Education: Modern Dance	1 (0-3-1)
ICPE 115 Physical Education: Self Defense	1 (0-3-1)
ICPE 117 Physical Education: Mind and Body	1 (0-3-1)
ICPE 118 Physical Education: American Flag Football	1 (0-3-1)
ICPE 121 Physical Education: Soccer	1 (0-3-1)
ICPE 123 Physical Education: Cycling	1 (0-3-1)
ICPE 124 Selected Topics in Sports	1 (0-3-1)

#### Major Courses

**130 credits**

#### Core Courses

**41 credits**

EGCI 100 Introduction to Computer Engineering	1 (0-2-1)
EGCI 111 Computer Programming	4 (3-2-7)
EGCI 200 Engineering Mathematics	4 (4-0-8)
EGCI 204 Engineering Mechanics	4 (4-0-8)
EGCI 206 Engineering Mathematics II	4 (4-0-8)
EGCI 230 Electric Circuit Analysis	4 (4-0-8)
EGCI 232 Engineering Electronics	4 (3-2-7)
EGCI 305 Statistics for Research in Computer Engineering	4 (4-0-8)
ICMA 215 Calculus	4 (4-0-8)
ICPY 132 Principles of Physics	4 (4-0-8)

ICPY 211 General Physics I	4 (4-0-8)
<b>Required Major Courses</b>	<b>65 credits</b>
EGCI 201 Discrete Mathematics	4 (4-0-8)
EGCI 205 Numerical Methods for Engineers	4 (4-0-8)
EGCI 212 Programming Techniques	4 (4-0-8)
EGCI 213 Programming Paradigms	4 (4-0-8)
EGCI 221 Data Structures and Algorithms	4 (4-0-8)
EGCI 233 Digital Circuit Design Lab	1 (0-2-1)
EGCI 234 Digital Circuit Design	4 (4-0-8)
EGCI 252 System Programming	4 (4-0-8)
EGCI 312 Professional Practices I	1 (0-2-1)
EGCI 313 Professional Practices II	1 (0-2-1)
EGCI 319 Internship in Computer Engineering	2 (0-12-2)
EGCI 321 Database Systems	4 (4-0-8)
EGCI 330 Microprocessors and Interfacing	4 (4-0-8)
EGCI 332 Embedded Systems	4 (4-0-8)
EGCI 333 Computer Architecture	4 (4-0-8)
EGCI 341 Software Engineering	4 (4-0-8)
EGCI 351 Operating Systems	4 (4-0-8)
EGCI 372 Data Communication and Computer Networks	4 (4-0-8)
EGCI 400 Morals and Ethical Studies for Computer Engineers	1 (1-0-2)
EGCI 491 Project Seminar	1 (0-2-1)
EGCI 492 Computer Engineering Project	2 (0-4-2)
<b>Elective Major Courses</b>	<b>24 credits</b>
<b>Network and Security Elective Courses</b>	
EGCI 432 Distributed Systems	4 (4-0-8)
EGCI 474 Internetworking Technologies I	4 (3-2-7)
EGCI 475 Internetworking Technologies II	4 (3-2-7)
EGCI 476 Cryptography and Computer Security	4 (4-0-8)
EGCI 477 Penetration Testing and Prevention	4 (4-0-8)
<b>System and Signal Elective Courses</b>	
EGCI 463 Pattern Recognition	4 (4-0-8)
EGCI 467 Natural Language and Speech Processing	4 (4-0-8)
EGCI 486 Image Processing	4 (4-0-8)
<b>Intelligent System Elective Courses</b>	
EGCI 425 Data Mining	4 (4-0-8)
EGCI 461 Artificial Intelligence	4 (4-0-8)
EGCI 465 Fuzzy Sets and Neural Networks	4 (4-0-8)
<b>Linguistic Software and Theory Elective Courses</b>	
EGCI 301 Computer Graphics	4 (4-0-8)
EGCI 331 Introduction to IC Design	4 (4-0-8)
EGCI 404 Theory of Computation	4 (4-0-8)
EGCI 427 Web Programming	4 (4-0-8)
EGCI 428 Mobile Device Programming	4 (4-0-8)

EGCI 429 Web Application Architecture	4 (4-0-8)
EGCI 494 Fundamental of Digital Forensics	4 (4-0-8)
<b>Field Work Elective Course</b>	
EGCI 493 Cooperative Education	8 (0-40-8)
<b>Free Elective Courses</b>	<b>8 credits</b>

Computer Engineering students **must select 8 credits** of free electives from **any of the courses** offered by Mahidol University. The choice is subject to the approval of the academic advisor.

The following courses **must not be taken** as free electives:

ICMA 102 Principles of Mathematics  
 ICMA 106 Calculus I  
 ICNS 101 Introduction to Mathematics  
 ICNS 103 Fundamental Mathematics  
 ICNS 104 Fundamental Statistics  
 ICNS 105 Basic Mathematics  
 ICNS 111 Fundamental Biology  
 ICNS 121 Fundamental Chemistry  
 ICNS 131 Fundamental Physics  
 ICNS 132 Principles of Physics  
 ICNS 141 Computer Essentials  
 ICNS 142 Introduction to Internet Technology  
 ICNS 143 Fundamental of Computer Science

# COMPUTER SCIENCE

## PROGRAM

### DEGREE OFFERED

**Bachelor of Science (Computer Science)**

**B.Sc. (Computer Science)**

### THE FIELD

The science of computing is transforming the world at a breathtaking pace. Think self-driving cars, the Internet of Things (IoT), artificial brains, smartphones, among others. Think medical advances made possible by the sheer computation power and our newfound ability to gather and sift through massive amounts of data. In this age, this is the science that touches every life and drives every modern endeavor. Through hands-on projects and active learning activities, students in the program will be trained not only to make excellent use of the state-of-the-art technology but also to create and drive future technology. Our holistic approach to education ensures that the students have a solid understanding of the fundamentals, in the context of the present technology—capable of executing it in the real-world. As a critical thinker with great communication skills, our students are well-prepared for the job market globally and for further education, whether they aspire to launch a new IT venture, develop a global-scale platform, be a leading researcher, or land a job at a tech giant.

The Computer Science curriculum brings together academic knowledge from diverse disciplines, cultivating in the students a problem-solving mindset in the spirit of liberal arts education. Furthermore, with the rise of big data, data science, and data-intensive applications, students may opt to specialize in Data Analytics & Software Engineering. This module trains the students to be specialists in working with and efficiently handling large and complex data, making them ideal hires for companies looking to build a data platform or extract value from a trove of data.

Because every student is different, each student has the freedom to customize his or her education plan from the beginning, with the expert help of the student's advisor. There are compelling options

for both research-oriented and employment-oriented students: write a thesis after a year-long research training—or apprentice with our industry partner for up to 6 months, potentially securing a job offer right after.

### CAREER OPPORTUNITIES

The Computer Science program prepares students for a multitude of career paths, including:

- Software developer/engineer capable of designing, implementing, and deploying solutions
- Data scientists and data platform engineers
- Further study in fields related to computing, including robotics and bioinformatics
- Owners of IT companies/startups
- Research and development in the commercial sector and in academia
- IT consultants and solution engineers, such as innovative agriculture and smart medicine
- Faculty position, teaching, or teaching assistant in the field of computing for academic institutions and international schools
- Customer relations in the IT sector, such as sales and customer service

### CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	40
Computer Science Core Courses	34
Computer Science Required Courses	66
Computer Science Elective Courses	28
Free Elective Courses	8
<b>Total</b>	<b>176</b>

# COURSE LIST

## Foundation Courses

	Non-credit
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

**Note I:** All students must take ICID 100 Freshman Seminar, a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

**Note III:** Students whose Mathematics placement is below ICMA 106 Calculus I or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I or ICMA 151 Statistics for Science I

## General Education

40 Credits

### English Communication

16 Credits

ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 103 Public Speaking	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

## Natural Sciences

8 Credits

### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)
ICGN 103 Essential Statistics	4 (4-0-8)
ICGN 104 Mathematics and Its Contemporary Applications	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)

ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy \*\*\*\*\***

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

**Note I: \*\*\*\*\*** Students in the Computer Science major **are not allowed** to register for any course in this above category.

**Humanities and Languages/ Social Sciences/Physical Education**

**16 Credits**

**Note:** Students can take any courses from Humanities and Foreign Languages, Social Sciences and Physical Education group to fulfill the required credits.

**Humanities**

• **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

• **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Foreign Languages**

• **German**

ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)

• **Japanese**

ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)

• **French**

ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)



- **Chinese**

ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)

- **Spanish**

ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)

- **Thai**

ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)

### Social Sciences

- **Financial, Economic Scientific and Environmental Literacy**

ICGS 101 Accounting for Young Entrepreneurs	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change	4 (4-0-8)
ICGS 103 Economics in Modern Business	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 105 Personal Financial Management	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)

- **Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)

- **Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

### Physical Education

ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)

ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

### Major Courses

**128 credits**

#### Major Core Courses

**34 credits**

ICCS 205 Numerical Computation	4 (4-0-8)
ICCS 206 Discrete Mathematics	4 (4-0-8)
ICCS 309 Scientific Research and Presentations	4 (4-0-8)
ICMA 106 Calculus I	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICMA 151 Statistics for Science I	4 (4-0-8)
ICPY 101 Physics I	4 (4-0-8)
ICPY 102 Physics II	4 (4-0-8)
ICPY 105 Integrated Laboratory in Physics I	2 (0-4-2)

#### Major Required Courses

**at least 66 credits**

Every computer science student has to complete at least 66 credits of required major courses from breadth and capstone categories. The student has to complete all breadth courses to cover core CS knowledge, and finish one of the two capstone options to gain experience working on a sizable research/development project.

#### Breadth Required Courses

ICCS 100 Computer Fundamentals and Concepts	4 (4-0-8)
ICCS 101 Introduction to Computer Programming	4 (3-2-7)
ICCS 121 System Skills and Low-level Programming	4 (4-0-8)
ICCS 161 Introduction to Data Science	4 (3-2-7)
ICCS 204 Data Structures and Object-Oriented Programming	4 (3-2-7)
ICCS 225 Database Foundations	4 (4-0-8)
ICCS 227 Principles of Computer Systems and Architecture	4 (4-0-8)
ICCS 271 Interaction Design	4 (4-0-8)
ICCS 311 Functional and Parallel Programming	4 (4-0-8)
ICCS 312 Algorithms and Tractability	4 (4-0-8)
ICCS 370 Software System Construction	4 (4-0-8)
ICMA 216 Calculus IIIA	2 (2-0-4)
ICMA 223 Linear Algebra A	2 (2-0-4)

#### Capstone Required Courses

##### Option 1: Senior Project

ICCS 407 Senior Project I	6 (0-12-6)
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ICCS 408 Senior Project II	6 (0-12-6)
ICCS 409 Senior Project III	6 (0-12-6)

### Option 2: Cooperative Education

ICCS 380 Cooperative Education Seminar	2 (2-0-0)
ICCS 381 Cooperative Education I	8 (8-0-288)
ICCS 382 Cooperative Education II	8 (8-0-288)

### Major Elective Courses

at least 28 credits

Every computer science student has to complete at least 28 credits of elective major courses pursuing one of the following two modules:

- **Computer Science Module:** Students in this module can customize the areas of knowledge they wish to pursue by creating a combination of courses from the following two categories:
  1. At least four CS elective courses listed in the table at the end of this section.
  2. No more than two courses from the Topics series (ICCS 412, ICCS 413, ICCS 423, ICCS 424, and ICCS 463 through ICCS 495).
  3. At most two major courses from another major that meet all of the following criteria:
    - They must belong to an academic program at MUIC as listed below, but these two courses do not have to belong to the same program.
      - o Biological Sciences
      - o Business Economics
      - o Chemistry
      - o Communication Design
      - o Computer Engineering
      - o Environmental Science
      - o Finance
      - o Food Science and Technology
      - o Intercultural Studies and Languages
      - o International Business
      - o International Hospitality Management
      - o Marketing
      - o Media and Communication Arts
      - o Physics
      - o Social Science
    - They have no equivalent CS courses.
  
- **Data Analytics and Software Engineering (DASE) Module:** Students in this module are required to fulfill their major elective requirements using at least 20 credits from the following list:
 

▪ ICBI 380 Introduction to System Biology and Bioinformatics	4 (4-0-8)
▪ ICCS 302 Human Computer Interaction and Visualization	4 (4-0-8)
▪ ICCS 315 Applied Algorithms	4 (4-0-8)
▪ ICCS 361 Data Mining	4 (4-0-8)
▪ ICCS 371 Scalable Systems	4 (4-0-8)
▪ ICCS 372 Software Engineering	4 (4-0-8)
▪ ICCS 461 Machine Learning	4 (4-0-8)
▪ ICCS 463 Special Topics in Machine Learning I	4 (4-0-8)
▪ ICCS 464 Special Topics in Machine Learning II	4 (4-0-8)

For the other 8 credits, students can customize their selection but have to follow rules (2) and (3) of the Computer Science module.

The following courses count towards computer science major elective courses:

ICBI 325 Special Topics in Bioinformatics and Molecular Genetics	4 (4-0-8)
ICBI 380 Introduction to System Biology and Bioinformatics	4 (4-0-8)
ICCS 302 Human Computer Interaction and Visualization	4 (4-0-8)
ICCS 303 Competitive Programming	4 (4-0-8)
ICCS 315 Applied Algorithms	4 (4-0-8)
ICCS 320 Computer Networks	4 (4-0-8)
ICCS 322 Operating Systems Design and Implementation	4 (4-0-8)
ICCS 323 IoT Electronics	4 (4-0-8)
ICCS 340 Web Application Development	4 (4-0-8)
ICCS 361 Data Mining	4 (4-0-8)
ICCS 371 Scalable Systems	4 (4-0-8)
ICCS 372 Software Engineering	4 (4-0-8)
ICCS 404 Computer Graphics and Augmented Reality	4 (4-0-8)
ICCS 412 Topics in Theory I	4 (4-0-8)
ICCS 413 Topics in Theory II	4 (4-0-8)
ICCS 418 Computer System Security	4 (4-0-8)
ICCS 423 Topics in Systems I	4 (4-0-8)
ICCS 424 Topics in Systems II	4 (4-0-8)
ICCS 444 E-Commerce	4 (4-0-8)
ICCS 448 Mobile Application Programming	4 (4-0-8)
ICCS 461 Machine Learning	4 (4-0-8)
ICCS 463 Special Topics in Machine Learning I	4 (4-0-8)
ICCS 464 Special Topics in Machine Learning II	4 (4-0-8)
ICCS 471 Topics in Software Technology I	4 (4-0-8)
ICCS 472 Topics in Software Technology II	4 (4-0-8)
ICCS 491 Topics in Computer Science I	4 (4-0-8)
ICCS 492 Topics in Computer Science II	4 (4-0-8)
ICCS 493 Topics in Computer Science III	4 (4-0-8)
ICCS 494 Topics in Computer Science IV	4 (4-0-8)
ICCS 495 Topics in Computer Science V	4 (4-0-8)
ICMA 214 Ordinary Differential Equations	4 (4-0-8)
ICMA 217 Calculus IIIB	2 (2-0-4)
ICMA 224 Linear Algebra B	2 (2-0-4)
ICMA 322 Advanced Calculus	4 (4-0-8)
ICMA 346 Optimization	4 (4-0-8)
ICMA 350 Probability	4 (4-0-8)
ICMA 424 Abstract Algebra	4 (4-0-8)
ICPY 492 Electronics	4 (4-0-8)

#### Free Elective Courses

**8 credits**

Computer Science students can take courses offered by Mahidol University International College, or courses offered by other faculties with permission from the advisor, as free electives, except courses in the Natural Science- ICT and Digital Literacy category, namely:

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology Behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

# ENVIRONMENTAL SCIENCE PROGRAM

## DEGREE OFFERED

**Bachelor of Science (Environmental Science)**

**B.Sc. (Environmental Science)**

## THE FIELD

Contemporary society is being challenged by a diverse array of extremely complex environmental problems driven by rapid increases in population and the demands on our life-support systems. Increased environmental pollution from the physical, chemical, and biological contaminants generated by industrial activities, agriculture and food production, and poor natural resource management continue to threaten the ecological and economic stability of our planet. Environmental studies have become necessary to meet the needs of the present age.

The Environmental Science Program provides educational and technical services in the fields of environment and natural resource management. The program trains students to explore environmental issues in Thailand and to conduct research projects with an aim towards sustainable development. Environment students learn how to follow a rigorous interdisciplinary approach to measure, quantify, predict and resolve serious environmental threats by integrating knowledge from appropriate disciplines. Students are expected to respond to issues such as natural resources conservation, ecosystem restoration, global warming, waste management, ground and surface water contamination, chemical toxicity, pollution prevention and control, and environmental planning and decision making.

## CAREER OPPORTUNITIES

- 1) Graduates can work as teachers or teaching assistants in the field of Environmental Science at any academic institute.
- 2) Graduates can work as teachers in the field of Environmental Science at any international schools.
- 3) Graduates can work in Research and Development departments of any company or manufacturer dealing in Environmental products.
- 4) Graduates can work in quality control or quality assurance positions.
- 5) Graduates can work as research assistants in research institutes or on research programs/projects either in Thailand or abroad.
- 6) Graduates can work in scientific instruments trading and services in both private and governmental sectors.
- 7) Graduates can continue their studies for a higher degree in any field of Environmental Science.
- 8) Graduates can continue their studies for a professional degree in the related fields such as Environmental Science, Environmental Biology, Ecology and Conservation, Ecotourism, etc.

Graduates can become the owner of companies that sell products and/or services in the field of Environmental Science, Environmental Biology, Ecology and Conservation, Ecotourism, etc.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	44
Core Science Courses	38
Required Major Courses	60
Elective Major Courses	36
Free Elective Courses	8
<b>Total</b>	<b>186</b>

# COURSE LIST

## Foundation Courses

	Non-credit
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

**Note I:** All students must take ICID 100 Freshman Seminar, a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

**Note III:** Students whose Mathematics placement is below ICMA 106 Calculus I or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I or ICMA 151 Statistics for Science I

## General Education

**44 Credits**

### English Communication

**16 Credits**

ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 103 Public Speaking	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

**Note I:** Students who are qualified to take ICGC 111 and 112 (Academic Writing and Research I and II (Advanced) may choose additional English Communication course to meet the minimum requirement of 12 credits.

**Note II:** Students who are required to take ICGC 101, 102, and 103 (Academic Writing and Research I and II, and Public speaking) will have to choose a fourth course in English Communication. Thus, total credits for English Communication will be 16.

## Natural Sciences

**8 Credits**

### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)
ICGN 103 Essential Statistics	4 (4-0-8)
ICGN 104 Mathematics and Its Contemporary Applications	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)

ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies *	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

*Note 1:* All students must take ICGN 117\*

**Humanities and Languages**

**8 Credits**

**Humanities**

• **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

• **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Foreign Languages**

• **German**

ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)

• **Japanese**

ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)

• **French**

ICGL 121 Elementary French I	4 (4-0-8)
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ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)
<b>• Chinese</b>	
ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)
<b>• Spanish</b>	
ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)
<b>• Thai</b>	
ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)
<b>Social Sciences</b>	<b>8 Credits</b>
<b>• Financial, Economic Scientific and Environmental Literacy</b>	
ICGS 103 Economics in Modern Business **	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship **	4 (4-0-8)
<i>Note I: All students must take ICGS 103 and ICGS 104 **</i>	
<b>Physical Education</b>	<b>4 Credits</b>
ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)
<b>Major Courses</b>	<b>134 credits</b>
<b>Core Science Courses</b>	
<b>38 credits</b>	
ICBI 101 Biology	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICPY 101 Physics I	4 (4-0-8)



ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)
ICMA 151 Statistics for Science I	4 (4-0-8)
ICMA 252 Biological Statistics Laboratory	2 (0-4-2)
ICEN 331 Soil, Land Use and Degradation	4 (4-0-8)
ICEN 403 Principle of Environmental Informatics	4 (4-0-8)
ICEN 464 Water Resources Management	4 (4-0-8)

#### Required Environmental Science Courses

**60 credits**

ICEN 211 Fundamentals and Applications of Environmental Microbiology	4 (3-2-7)
ICEN 212 Ecological Systems Analysis	4 (4-0-8)
ICEN 241 Environmental Pollution I	4 (4-0-8)
ICEN 312 Environmental Toxicology	4 (4-0-8)
ICEN 341 Environmental Quality Analysis I	4 (2-4-6)
ICEN 342 Environmental Pollution II	4 (4-0-8)
ICEN 343 Environmental Quality Analysis II	4 (2-4-6)
ICEN 351 Population and the Environment	4 (4-0-8)
ICEN 361 Principles of Environmental Impact Assessment	4 (4-0-8)
ICEN 393 Practical Training in Environment	2 (0-4-2)
ICEN 402 Geoinformatics	4 (3-2-7)
ICEN 491 Seminar in Environmental Science	2 (2-0-4)
ICEN 492 Environmental Field Excursions	2 (0-4-2)
ICEN 496 Senior Project in Environmental Science	6 (0-12-6)
ICCH 211 General Chemistry II	4 (4-0-8)
ICCH 221 Organic Chemistry I	4 (4-0-8)

#### Elective Environmental Science Courses

**36 credits**

ICBI 103 Biology II	4 (4-0-8)
ICBI 215 General Biochemistry	4 (4-0-8)
ICBI 216 Cell Biology	4 (4-0-8)
ICBI 221 Animal Biology	4 (3-2-7)
ICBI 231 Plant Biology	4 (3-2-7)
ICBI 262 Practical Field Ecology and Conservation	4 (3-2-7)
ICBI 311 Human Physiology	4 (3-2-7)
ICBI 440 Marine Ecology and Conservation	4 (4-0-8)
ICBI 442 Marine Ecology Field Study	2 (0-4-2)
ICCH 311 Analytical Chemistry	4 (3-2-7)
ICEN 301 Basic Environmental Statistics	4 (4-0-8)
ICEN 313 Waste Minimization and Clean Technology	4 (4-0-8)
ICEN 314 Tropical Ecology	4 (3-2-7)
ICEN 317 Aquatic Ecology	4 (4-0-8)
ICEN 318 Aquatic Ecology Field Course	4 (0-8-4)
ICEN 319 Conservation Ecology	4 (4-0-8)
ICEN 320 Population and Community Ecology	4 (3-2-7)
ICEN 332 Introduction to Oceanography	4 (3-2-7)
ICEN 352 Environmental and Resource Economics	4 (4-0-8)
ICEN 362 Natural Resource Conservation and Management	4 (4-0-8)
ICEN 391 Sustainable Development	4 (4-0-8)
ICEN 392 Environmental Issues: Past, Present and Future	4 (4-0-8)

ICEN 401 Applied Mathematics for Environmental Studies	4 (4-0-8)
ICEN 411 Climate Change and Its Impact	4 (4-0-8)
ICEN 413 Environmental Remediation Technology	4 (4-0-8)
ICEN 414 Waste Utilization	4 (4-0-8)
ICEN 415 Biodiversity	4 (4-0-8)
ICEN 416 Ecotoxicology	4 (4-0-8)
ICEN 421 Water and Wastewater Treatment	4 (4-0-8)
ICEN 422 Solid and Hazardous Waste Management	4 (4-0-8)
ICEN 431 Land Use and Urban Environmental Planning	4 (4-0-8)
ICEN 432 Global Geomorphology	4 (4-0-8)
ICEN 441 Occupational Health and Safety	4 (4-0-8)
ICEN 460 Ecotourism	4 (2-4-6)
ICEN 461 Energy Conservation and Development	4 (4-0-8)
ICEN 462 Coastal and Marine Resources	4 (4-0-8)
ICEN 465 Resource Inventory and Baseline Studies Methods	4 (3-2-7)
ICEN 466 Environmental Management Systems	4 (4-0-8)
ICEN 467 Environmental Risk Assessment and Management	4 (4-0-8)
ICEN 468 Environmental Management Policy	4 (4-0-8)
ICEN 469 Heritage Conservation	4 (2-4-6)
ICEN 483 Physical Planning and Environment	4 (4-0-8)
ICEN 484 Climate Change Mitigation and Adaptation to Changing Disaster	4 (4-0-8)

**Free Elective Courses**
**8 credits**

Students can take any courses offered by Mahidol University as a free elective course with approval from the advisor except in Natural Science group.

# FOOD SCIENCE AND TECHNOLOGY PROGRAM

## DEGREE OFFERED

**Bachelor of Science (Food Science and Technology)**

**B.Sc. (Food Science and Technology)**

There are 2 concentrations:

1. Food Science
2. Culinary Science

## THE FIELD

Food Science and Technology involves the application of a variety of scientific disciplines to food manufacturing. Food Science and Technology students learn the chemistry, microbiology, structure, engineering, safety and nutrition of food as it is processed, packed, distributed, stored and used.

Food manufacturing is the mass production of food products from raw animal and plant materials, utilizing principles of food technology. It is one of the largest industries in Thailand and involves the selection, preservation, processing, packaging, distribution and use of safe, nutritious, and wholesome food. Modern consumers generally take for granted the vast array of foods available in their modern diet and do not know about the extensive research and development that has been done in order to deliver tasty, nutritious, safe and convenient foods.

A Food Scientist studies the physical, microbiological and chemical makeup of food and compiles information about foods and their components. Depending on their area of specialization, Food Scientists may develop ways to process, preserve, package or store food according to industry and government specifications and regulations, either domestically or internationally.

## CAREER OPPORTUNITIES

1. Graduates can work in quality control or quality Assurance positions in food manufacturing and related markets.
2. Graduates can work in Food Product Research and Development departments.
3. Graduates can work in trading and services departments in private and governmental sectors.
4. Graduates will be demanded in food manufacturing and related markets.
5. Graduates can work in customer relations for food companies

Graduates can work in the field of food science and technology in academic organizations either in Thailand or outside Thailand.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	38
Major Courses	135
Free Elective Courses	8
<b>Total</b>	<b>181</b>

# COURSE LIST

## Foundation Courses

	Non-credit
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

**Note I:** All students must take ICID 100 Freshman Seminar, a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

**Note III:** Students whose Mathematics placement is below ICMA 106 Calculus I or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I or ICMA 151 Statistics for Science I

## General Education Courses

**38 credits**

### English Communication

**12 Credits**

ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 103 Public Speaking	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

**Note I:** Students who are qualified to take ICGC 111 and 112 (Academic Writing and Research I and II (Advanced)) may choose additional English Communication course to meet the minimum requirement of 12 credits.

**Note II:** Students who are required to take ICGC 101, 102, and 103 (Academic Writing and Research I and II, and Public speaking) will have to choose a fourth course in English Communication. Thus, total credits for English Communication will be 16.

## Natural Sciences

**8 Credits**

### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)
ICGN 103 Essential Statistics	4 (4-0-8)
ICGN 104 Mathematics and Its Contemporary Applications	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)

ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

**Humanities and Languages**

**8 Credits**

**Humanities**

• **Logical and Ethical Literacy**

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)

• **Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Foreign Languages**

• **German**

ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)

• **Japanese**

ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)

• **French**

ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)

- **Chinese**

ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)

- **Spanish**

ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)

- **Thai**

ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)

**Social Sciences**
**8 Credits**

- **Financial, Economic Scientific and Environmental Literacy**

ICGS 101 Accounting for Young Entrepreneurs	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change	4 (4-0-8)
ICGS 103 Economics in Modern Business	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 105 Personal Financial Management	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)

- **Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)

- **Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**Physical Education**
**2 Credits**

ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)

ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

### Food Science Concentration

#### Major Courses

**135 credits**

#### Core Courses

**52 credits**

ICBI 101 Biology	4 (4-0-8)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 211 General Chemistry II	4 (4-0-8)
ICCH 221 Organic Chemistry I	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICCH 311 Analytical Chemistry	4 (3-2-7)
ICFS 214 Elements of Physical Chemistry and Biochemistry for Food Science	4 (4-0-8)
ICFS 215 Human Nutrition	4 (4-0-8)
ICFS 231 General Microbiology	4 (3-2-7)
ICMA 106 Calculus I	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)
ICMA 151 Statistics for Science I	4 (4-0-8)
ICMA 252 Biological Statistics Laboratory	2 (0-4-2)
ICPY 101 Physics I	4 (4-0-8)

#### Major Required Courses

**71 credits**

ICFS 111 Introduction to Food Science and Technology	4 (3-2-7)
ICFS 314 Food Analysis	4 (3-2-7)
ICFS 317 Food Chemistry	4 (3-2-7)
ICFS 318 Food Ingredients Functionality	2 (2-0-4)
ICFS 319 The Chemistry of Food and Quality	2 (2-0-4)
ICFS 333 Food Microbiology	4 (4-0-8)
ICFS 334 Food Microbiology Laboratory	2 (0-4-2)
ICFS 341 Food Processing	4 (3-2-7)
ICFS 342 Food Storage and Shelflife Extension	4 (3-2-7)
ICFS 343 Integrated Approach to Smart and Green Agro-Industry	4 (4-0-8)
ICFS 351 Food Engineering Principles	2 (2-0-4)
ICFS 352 Unit Operations in Food Engineering	3 (3-0-6)
ICFS 361 Principles of Quality Assurance in Food Processing	4 (4-0-8)
ICFS 362 Food Safety and Sanitation	4 (4-0-8)
ICFS 363 Food Law and Standard of Commercial Food Products	4 (4-0-8)
ICFS 411 Food Product Development	4 (4-0-8)
ICFS 451 Internship in Food Science and Technology	4 (0-12-4)

ICFS 491 Seminar in Food Science and Technology	2 (2-0-4)
ICFS 495 Senior Project in Food Science and Technology I	2 (0-4-2)
ICFS 496 Senior Project in Food Science and Technology II	4 (0-8-4)
ICSC 302 Scientific Research and Presentations	4 (4-0-8)

**Note:** Students may choose one of the following two options.

1. **Research Track:** ICFS 451 Internship in Food Science and Technology and ICFS 495 Senior Project in Food Science and Technology I and ICFS 496 Senior Project in Food Science and Technology II for a total 10 credits
2. **Cooperative Education Track:** ICFS 461 Cooperative Education Preparation and ICFS 462 Cooperative Education for a total 10 credits

ICFS 461 Cooperative Education Preparation	2 (2-0-4)
ICFS 462 Cooperative Education	8 (0-24-0)

### Major Elective Courses

**12 credits**

ICFS 323 Foods for Sports and Exercises	4 (4-0-8)
ICFS 374 Experimental Design in Food Product Development	2 (1-2-.3)
ICFS 375 Integrated Sensory and Consumer Sciences for Product Development	4 (3-2-7)
ICFS 376 Science of Thai Culinary Arts	4 (3-2-7)
ICFS 413 Marketing of Food Product and Services	2 (2-0-4)
ICFS 414 Operations Management in Food Business	2 (2-0-4)
ICFS 418 Fruits and Vegetables Technology	4 (3-2-7)
ICFS 419 Meat, Poultry and Marine Product Technology	4 (3-2-7)
ICFS 422 Dairy Products Technology	4 (3-2-7)
ICFS 423 Beverage Technology	4 (3-2-7)
ICFS 424 Fat and Oil Technology	4 (3-2-7)
ICFS 426 Bakery Product Technology	4 (3-2-7)
ICFS 427 Confectionary and Chocolate Technology	4 (3-2-7)
ICFS 432 Sensory Evaluation of Food Products	4 (3-2-7)
ICFS 436 Food Fermentation Technology	4 (3-2-7)
ICFS 437 Application of Modern Biotechnology to Food Products	4 (3-2-7)
ICFS 438 Cereal and Starch Technology	4 (3-2-7)
ICFS 452 Food Packaging	4 (3-2-7)
ICFS 463 Field Trip	2 (0-6-2)
ICFS 471 Trends and Novel Techniques of World Foods and Cuisines	4 (3-2-7)

### Culinary Science Concentration

#### Major Courses

**135 credits**

#### Core Courses

**52 credits**

**Note:** all core courses are the same as core courses of Food Science Concentration

#### Major Required Courses

**79 credits**

ICCS 161 Introduction to Data Science	4 (3-2-7)
ICFS 111 Introduction to Food Science and Technology	4 (3-2-7)
ICFS 171 Discovering Culinary Techniques	4 (2-4-6)
ICFS 172 World Cuisines	4 (2-4-6)
ICFS 314 Food Analysis	4 (3-2-7)



ICFS 317 Food Chemistry	4 (3-2-7)
ICFS 318 Food Ingredients Functionality	2 (2-0-4)
ICFS 333 Food Microbiology	4 (4-0-8)
ICFS 334 Food Microbiology Laboratory	2 (0-4-2)
ICFS 341 Food Processing	4 (3-2-7)
ICFS 342 Food Storage and Shelf-life Extension	4 (3-2-7)
ICFS 343 Integrated Approach to Smart and Green Agro-industry	4 (4-0-8)
ICFS 351 Food Engineering Principles	2 (2-0-4)
ICFS 352 Unit Operations in Food Engineering	3 (3-0-6)
ICFS 361 Principles of Quality Assurance in Food Processing	4 (4-0-8)
ICFS 363 Food Law and Standard of Commercial Food Products	4 (4-0-8)
ICFS 373 Food Safety for Food Service Industry	2 (2-0-4)
ICFS 374 Experimental Design in Food Product Development	2 (1-2-3)
ICFS 375 Integrated Sensory and Consumer Sciences for Product Development	4 (3-2-7)
ICFS 413 Marketing of Food Product and Services	2 (2-0-4)
ICFS 414 Operations Management in Food Business	2 (2-0-4)
ICFS 432 Sensory Evaluation of Food Products	4 (3-2-7)
ICFS 451 Internship in Food Science and Technology	4 (0-12-4)
ICFS 489 Culinary Product Development Project	2 (0-4-2)

#### Major Elective Courses

**4 credits**

ICFS 323 Foods for Sports and Exercise	4 (4-0-8)
ICFS 376 Science of Thai Culinary Arts	4 (3-2-7)
ICFS 418 Fruits and Vegetables Technology	4 (3-2-7)
ICFS 419 Meat, Poultry and Marine Product Technology	4 (3-2-7)
ICFS 422 Dairy Products Technology	4 (3-2-7)
ICFS 423 Beverage Technology	4 (3-2-7)
ICFS 424 Fat and Oil Technology	4 (3-2-7)
ICFS 426 Bakery Product Technology	4 (3-2-7)
ICFS 427 Confectionary and Chocolate Technology	4 (3-2-7)
ICFS 436 Food Fermentation Technology	4 (3-2-7)
ICFS 437 Application of Modern Biotechnology to Food Products	4 (3-2-7)
ICFS 438 Cereal and Starch Technology	4 (3-2-7)
ICFS 452 Food Packaging	4 (3-2-7)
ICFS 453 Internship in Culinary Science	4 (0-12-4)
ICFS 463 Field Trip	2 (0-6-2)
ICFS 471 Trends and Novel Techniques of World Foods and Cuisines	4 (3-2-7)

#### Free Elective Courses

**no less than 8 credits**

Food Science students can take any course offered by Mahidol University as a free elective, except the following

- ICGN 108 Essentials of Culinary Science for Food Business 4 (4-0-8)
- ICGN 109 Food for Health 4 (4-0-8)

# PHYSICS PROGRAM

## DEGREE OFFERED

**Bachelor of Science (Physics)**

**B.Sc. (Physics)**

There are 2 tracks:

1. Astrophysics
2. Computational Physics

## THE FIELD

Physics, one of the major basic sciences, essentially focuses on the elements of matter, their interaction, energy and applications. Physics plays a fundamental role both in the sciences and in the world of technology. It also provides the skills for dealing with all of the scientific concepts. An understanding of physics is also useful for students in social sciences and valuable for anyone interested in the full range of human culture. MUIC offers a Physics Major to produce graduates who are knowledgeable and highly qualified in this scientific discipline. There is a great demand for graduates in physics who can contribute to both national development in science and technology and international scientific advancement.

## CAREER OPPORTUNITIES

1. Researcher in international institutes
2. Physics instructors
3. Financial analysts.
4. Start-up Entrepreneurs.
5. Consultants at technology based company.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	44
Core Courses	38
Major Required Courses	62
Major Elective Courses	24
Free Elective Courses	8
<b>Total</b>	<b>176</b>

# COURSE LIST

## Foundation Courses

	Non-credit
ICID 100 Freshman Seminar	0 (0-1-0)
ICMA 100 Foundation Mathematics	0 (4-0-0)
ICME 100 English Resource Skills	0 (4-0-0)

**Note I:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101

**Note II:** Students whose Mathematics placement is below ICMA 106 Calculus I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus.

**Note III:** All students must take ICID 100 Freshman Seminar, a non-credit course.

## General Education

44 Credits

### English Communication

16 Credits

ICGC 101 Academic Writing and Research I	4 (4-0-8)
ICGC 102 Academic Writing and Research II	4 (4-0-8)
ICGC 103 Public Speaking	4 (4-0-8)
ICGC 111 Academic Writing and Research I (Advanced)	4 (4-0-8)
ICGC 112 Academic Writing and Research II (Advanced)	4 (4-0-8)
ICGC 201 Global Realities	4 (4-0-8)
ICGC 202 Literary Analysis	4 (4-0-8)
ICGC 203 Creative Writing	4 (4-0-8)
ICGC 204 Advanced Oral Communication	4 (4-0-8)
ICGC 205 Linguistics	4 (4-0-8)
ICGC 206 Literature Into Film	4 (4-0-8)
ICGC 207 Diverse English Speaking Cultures	4 (4-0-8)
ICGC 208 Language and Culture	4 (4-0-8)
ICGC 209 The Story of English	4 (4-0-8)
ICGC 210 First and Second Language Acquisition	4 (4-0-8)
ICGC 211 Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel	4 (4-0-8)
ICGC 213 Topics in Comparative Literature C: Drama	4 (4-0-8)

**EC track (16 credits):** Students are required to take ICGC 101, ICGC 102 and ICGC 103. Once they pass ICGC 103, they must choose one EC IV course (ICGC 2xx) to fulfill their English Communication requirements.

**Advanced Track (12 credits):** Students are required to take ICGC 111 and ICGC 112. Once they pass ICGC 112, they must choose one EC IV course to fulfil their English Communication requirements. These students will be required to complete only 12 credits in English. 4 credits of General Education in English will be waived.

## Natural Sciences

4 Credits

### • Scientific and Environmental Literacy

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)

ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)
ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)

*Note:* \*\* All Physics students **are not allowed** to take ICGN 102, ICGN 103, ICGN 104, ICGN 107, ICGN 111, ICGN 114, ICGN 118, and ICGN 119 to fulfill the requirement of Natural Sciences. \*\*

## Humanities and Languages

**12 Credits**

### Humanities

*Note I:* Students are required to take at least 4 credits from an ICGH course, the other 8 credits can be chosen from any listed ICGH and ICGL courses

ICGH 101 Biotechnology: from Science to Business	4 (4-0-8)
ICGH 102 Famous Arguments and Thought Experiments in Philosophy	4 (4-0-8)
ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments	4 (4-0-8)
ICGH 104 Moral Reasoning: How can we know what is good?	4 (4-0-8)
ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!	4 (4-0-8)
ICGH 106 The Greeks: Crucible of Civilization	4 (4-0-8)
ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)
ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)
ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)
ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)
ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)
ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)
ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)

### Social Sciences

**8 Credits**

ICGS 101 Accounting for Young Entrepreneurs	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change	4 (4-0-8)

ICGS 103 Economics in Modern Business	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 105 Personal Financial Management	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)
ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)
ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

#### Physical Education

**4 Credits**

ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

#### Major Courses in Physics

**124 credits**

#### Core Science Courses

**38 credits**

ICBI 101 Biology	4 (4-0-8)
ICBI 102 Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICBI 103 Biology II	4 (4-0-8)
ICCH 210 General Chemistry I	4 (4-0-8)
ICCH 211 General Chemistry II	4 (4-0-8)
ICCH 224 Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICMA 106 Calculus I	4 (4-0-8)
ICMA 213 Calculus II	4 (4-0-8)

ICPY 101 Physics I	4 (4-0-8)
ICPY 102 Physics II	4 (4-0-8)
ICPY 105 Integrated Laboratory in Physics I	2 (0-4-2)

**Required Major Courses****62 credits**

ICPY 200 Modern Physics	4 (4-0-8)
ICPY 221 Computer Programming for Physics	4 (4-0-8)
ICPY 231 Mathematical Methods for Physics IA	2 (2-0-4)
ICPY 232 Mathematical Methods for Physics IB	2 (2-0-4)
ICPY 309 Scientific Research and Presentation	4 (4-0-8)
ICPY 321 Intermediate Mechanics	4 (4-0-8)
ICPY 322 Electricity and Magnetism	4 (4-0-8)
ICPY 323 Electrodynamics	4 (4-0-8)
ICPY 324 Waves and Optics	4 (4-0-8)
ICPY 334 Numerical Methods in Physics	4 (4-0-8)
ICPY 342 Integrated Laboratory in Physics II	2 (0-4-2)
ICPY 343 Integrated Laboratory in Physics III	2 (0-4-2)
ICPY 361 Quantum Mechanics I	4 (4-0-8)
ICPY 441 Senior Project in Physics	6 (0-12-6)
ICPY 451 Analytical Mechanics	4 (4-0-8)
ICPY 452 Statistical Mechanics	4 (4-0-8)
ICPY 461 Quantum Mechanics II	4 (4-0-8)

**Major Elective Courses\*****24 credits**

ICCS 204 Data Structures and Object-Oriented Programming	4 (3-2-7)
ICCS 206 Discrete Mathematics	4 (4-0-8)
ICMA 424 Abstract Algebra	4 (4-0-8)
ICPY 233 Mathematical Methods for Physics IIA	2 (2-0-4)
ICPY 234 Mathematical Methods for Physics IIB	2 (2-0-4)
ICPY 333 Mathematical Methods in Physics III	4 (4-0-8)
ICPY 355 Special Topics in Physics I	4 (4-0-8)
ICPY 356 Special Topics in Physics II	4 (4-0-8)
ICPY 357 Special Topics in Laboratory Physics I	4 (3-2-7)
ICPY 371 Thermal Physics	4 (4-0-8)
ICPY 455 Special Topics in Physics III	4 (4-0-8)
ICPY 456 Special Topics in Physics IV	4 (4-0-8)
ICPY 457 Special Topics in Laboratory Physics II	4 (3-2-7)
ICPY 463 Quantum Mechanics III	4 (4-0-8)
ICPY 471 Atomic and Molecular Physics	4 (4-0-8)
ICPY 472 Solid State Physics	4 (4-0-8)
ICPY 473 Nuclear and Particle Physics	4 (4-0-8)
ICPY 474 Astrophysics	4 (4-0-8)
ICPY 484 Cosmology	4 (4-0-8)
ICPY 486 Observational Astronomy	4 (4-0-8)
ICPY 487 Data Analysis in Astronomy	4 (4-0-8)
ICPY 488 Special Topics in Astronomy	4 (4-0-8)
ICPY 490 Computational Physics	4 (4-0-8)
ICPY 492 Electronics	4 (4-0-8)
ICPY 496 Biophysics	4 (4-0-8)

\*Students should take the following elective major courses for:

- **Astrophysics track**, choose at least three of these courses: ICPY 474, ICPY 484, ICPY 486, ICPY 487, ICPY 488
- **Computational Physics track**, choose: ICCS 204, ICPY 490

#### Free Elective Courses

8 credits

Physics students **can take any courses** offered by Mahidol University as a free elective course with approval from the advisor, **except** for the following:

ICGN 102 Essential Mathematics

ICGN 103 Essential Statistics

ICGN 104 Mathematics and Its Contemporary Applications

ICGN 107 The Chemistry of Everyday Life

ICGN 111 Physics for CEO

ICGN 114 The Scientific Approach and Society

ICGN 118 Everyday Connectivity

ICGN 119 Computer Essentials





**SOCIAL SCIENCE**

Division



# INTERNATIONAL RELATIONS AND GLOBAL AFFAIRS PROGRAM

## DEGREE OFFERED

Bachelor of Arts (International Relations and Global Affairs)

B.A. (International Relations and Global Affairs)

## THE FIELD

The Social Science Division currently offers a Bachelor degree in International Relations and Global Affairs where students can graduate within three years. The program prepares students for a wide variety of careers in public and private sectors, international organizations and NGOs. Building on existing Divisional and College strengths, it provides students with the skills and knowledge essential for success in a competitive, interdependent and rapidly-changing 21st century. It supports the goal, articulated in the Thailand 4.0 program, of "International awareness and orientation: harnessing globalization". Students can choose a Senior Thesis or Internship to prepare them for further academic studies and / or a professional career.

## Career Opportunities

The Social Science Division is committed to providing high quality education to our students integrating academic and practical skills based content in courses. Our alumni are engaged in wide range of professions which include but are not limited to the following; politics, government, diplomats, NGO professionals, United Nations, commercial aircraft pilots, entrepreneurship, development agencies, tourism and travel, hotel management, consultants, journalism, international business and many more.

## CURRICULUM STRUCTURE

### International Relations and Global Affairs Major

Courses	Credits
General Education Courses	40
Core Courses	52
Major Elective Courses	60
Free Elective Courses	8
<b>Total</b>	<b>160</b>

# COURSE LIST

## Foundation Courses

**Non Credit**

ICID 100 Freshman Seminar

0 (0-1-0)

ICME 100 English Resource Skills

0 (4-0-0)

**Note I:** All students must take ICID 100 Freshman Seminar, a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

## General Education Courses

**no less than 40 Credits**

### English Communication

**no less than 16 credits**

ICGC 101 Academic Writing and Research I

4 (4-0-8)

ICGC 102 Academic Writing and Research II

4 (4-0-8)

ICGC 103 Public Speaking

4 (4-0-8)

ICGC 111 Academic Writing and Research I (Advanced)

4 (4-0-8)

ICGC 112 Academic Writing and Research II (Advanced)

4 (4-0-8)

ICGC 201 Global Realities

4 (4-0-8)

ICGC 202 Literary Analysis

4 (4-0-8)

ICGC 203 Creative Writing

4 (4-0-8)

ICGC 204 Advanced Oral Communication

4 (4-0-8)

ICGC 205 Linguistics

4 (4-0-8)

ICGC 206 Literature Into Film

4 (4-0-8)

ICGC 207 Diverse English Speaking Cultures

4 (4-0-8)

ICGC 208 Language and Culture

4 (4-0-8)

ICGC 209 The Story of English

4 (4-0-8)

ICGC 210 First and Second Language Acquisition

4 (4-0-8)

ICGC 211 Topics in Comparative Literature A: Poetry

4 (4-0-8)

ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel

4 (4-0-8)

ICGC 213 Topics in Comparative Literature C: Drama

4 (4-0-8)

**Note I:** All students are required to take the first three courses (12 credits) in the General Education requirement for English without interruption beginning in their first trimester of enrollment. Students may then select any 200+ level English courses to complete their final 4 credits.

**Note II:** Based on their achievement on the essay portion of the MUIC entrance exam, some students may be placed into the 'Advanced Track' for their General Education requirement in English. These students will be required to complete only 12 credits in English: ICCM111 and ICCM 112 in order, and finally, any 200+ level English courses.

## Humanities and Foreign Languages

**no less than 8 credits**

### Humanities

#### • Logical and Ethical Literacy

ICGH 101 Biotechnology: from Science to Business

4 (4-0-8)

ICGH 102 Famous Arguments and Thought Experiments in Philosophy

4 (4-0-8)

ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments

4 (4-0-8)

ICGH 104 Moral Reasoning: How can we know what is good?

4 (4-0-8)

ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!

4 (4-0-8)

ICGH 106 The Greeks: Crucible of Civilization

4 (4-0-8)

**Note I:** Students can choose two subjects among the list above

**• Arts and Media Literacy**

ICGH 107 Contemporary Art and Visual Culture	4 (4-0-8)
ICGH 108 Creative Drawing Expression	4 (2-4-6)
ICGH 109 Creative Thinking Through Art and Design	4 (2-4-6)
ICGH 110 Drawing as Visual Analysis	4 (2-4-6)
ICGH 111 Media Literacy: Skills for 21st Century Learning	4 (4-0-8)
ICGH 112 Photography	4 (2-4-6)
ICGH 113 Moving Pictures: A History of Film	4 (4-0-8)
ICGH 114 The Sound of Music: Form, Emotion, and Meaning	4 (4-0-8)

**Foreign Languages**
**• German**

ICGL 101 Elementary German I	4 (4-0-8)
ICGL 102 Elementary German II	4 (4-0-8)
ICGL 103 Elementary German III	4 (4-0-8)

**• Japanese**

ICGL 111 Elementary Japanese I	4 (4-0-8)
ICGL 112 Elementary Japanese II	4 (4-0-8)
ICGL 113 Elementary Japanese III	4 (4-0-8)

**• French**

ICGL 121 Elementary French I	4 (4-0-8)
ICGL 122 Elementary French II	4 (4-0-8)
ICGL 123 Elementary French III	4 (4-0-8)

**• Chinese**

ICGL 131 Elementary Chinese I	4 (4-0-8)
ICGL 132 Elementary Chinese II	4 (4-0-8)
ICGL 133 Elementary Chinese III	4 (4-0-8)

**• Spanish**

ICGL 141 Elementary Spanish I	4 (4-0-8)
ICGL 142 Elementary Spanish II	4 (4-0-8)
ICGL 143 Elementary Spanish III	4 (4-0-8)

**• Thai**

ICGL 160 Introduction to Thai Language and Culture	4 (4-0-8)
ICGL 161 Elementary Thai I	4 (4-0-8)
ICGL 162 Elementary Thai II	4 (4-0-8)
ICGL 163 Elementary Thai III	4 (4-0-8)

**Natural Sciences**
**4 Credits**
**• Scientific and Environmental Literacy**

ICGN 101 Decision Mathematics	4 (4-0-8)
ICGN 102 Essential Mathematics	4 (4-0-8)
ICGN 103 Essential Statistics	4 (4-0-8)

ICGN 104 Mathematics and Its Contemporary Applications	4 (4-0-8)
ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia	4 (3-2-7)
ICGN 106 Climate Change and Human Society	4 (4-0-8)
ICGN 107 The Chemistry of Everyday Life	4 (4-0-8)
ICGN 108 Essentials of Culinary Science for Food Business	4 (3-2-7)
ICGN 109 Food for Health	4 (4-0-8)
ICGN 110 Maker Workshop	4 (3-2-7)
ICGN 111 Physics for CEO	4 (4-0-8)
ICGN 112 Stargazer	4 (3-2-7)
ICGN 113 Plants, People and Poisons	4 (4-0-8)
ICGN 114 The Scientific Approach and Society	4 (4-0-8)
ICGN 115 Human Evolution, Diversity and Health	4 (4-0-8)

• **ICT and Digital Literacy**

ICGN 116 Understanding and Visualizing Data	4 (3-2-7)
ICGN 117 Technology behind E-Business and Digital Strategies	4 (3-2-7)
ICGN 118 Everyday Connectivity	4 (4-0-8)
ICGN 119 Computer Essentials	4 (4-0-8)

*Note I:* Students can choose one subject among the list above in Natural Sciences and ICT and Digital Literacy

**Social Sciences**

**12 Credits**

• **Financial, Economic Scientific and Environmental Literacy**

ICGS 101 Accounting for Young Entrepreneurs	4 (4-0-8)
ICGS 102 Business Sustainability and the Global Climate Change	4 (4-0-8)
ICGS 103 Economics in Modern Business	4 (4-0-8)
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 105 Personal Financial Management	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)

*Note I:* Students can choose one subject among the list above

• **Global and Multicultural Literacy**

ICGS 109 American History, Film and Modern Life	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 111 Exploring Religions	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 113 Perspectives on the Thai Past	4 (4-0-8)
ICGS 114 Power, Money and Behavior of Powerful States	4 (4-0-8)
ICGS 115 Sociology in the Modern World	4 (4-0-8)
ICGS 116 Power and Politics	4 (4-0-8)
ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 119 World Politics	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)

- **Psychological Literacy**

ICGS 121 Abnormal Colleagues: how do I make this work?	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**Note I:** Students can choose three subjects among the list above from both Global and Multicultural Literacy and Psychological Literacy

**Physical Education**

ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

**Note I:** Students can choose to take any course in Physical Education but these courses are not required in the International Relations and Global Affairs program and these credits will not be counted towards graduation

**Major Courses** **112 credits**

**Major Core Courses** **52 credits**

*\*\*All students majoring in International Relations and Global Affairs must take the following courses:*

ICIR 101 Approaches to International Relations and Global Affairs	4 (4-0-8)
ICIR 102 Approaches to Comparative Politics and Systems	4 (4-0-8)
ICIR 201 The Formation of the Modern World: From the Industrial Revolution to High Imperialism	4 (4-0-8)
ICIR 202 Globalization and the International Order in the Twentieth Century: From the First World War to 9/11	4 (4-0-8)
ICIR 203 Foundations of Political Thought	4 (4-0-8)
ICIR 204 Perspectives on International Relations	4 (4-0-8)
ICIR 213 Conflict, War and Peace Studies	4 (4-0-8)
ICIR 215 Thai Foreign Policy	4 (4-0-8)
ICIR 221 International Political Economy	4 (4-0-8)
ICIR 222 International Organizations	4 (4-0-8)
ICIR 301 Research Methods	4 (4-0-8)
ICIR 302 ASEAN and Southeast Asian Regionalism	4 (4-0-8)
ICIR 343 The Creative Job Search	4 (4-0-8)

**Major Electives Courses**
**60 credits**
*All students majoring in International Relations and Global Affairs can choose from the following courses:*
**International Relations and World Politics**

ICIR 211 Globalization and Social Change	4 (4-0-8)
ICIR 223 Democracy as a Political System	4 (4-0-8)
ICIR 224 Security and Conflict in a Global Perspective	4 (4-0-8)
ICIR 225 Global Media, Social Change and International Relations	4 (4-0-8)
ICIR 226 The History and Concept of Diplomacy	4 (4-0-8)
ICIR 303 Transnational Movements and Migration	4 (4-0-8)
ICIR 304 Transnational Crime	4 (4-0-8)
ICIR 305 Conflict Resolution	4 (4-0-8)
ICIR 311 Foreign Policy Analysis	4 (4-0-8)
ICIR 312 International Law and International Relations	4 (4-0-8)
ICIR 313 Human Rights and International Relations	4 (4-0-8)
ICIR 314 International Development Studies	4 (4-0-8)
ICIR 315 Devolution, Privatization and State Failure	4 (4-0-8)
ICIR 321 Political Risk, Business and International Relations	4 (4-0-8)
ICIR 322 The Politics and Economics of Non-Governmental Organizations	4 (4-0-8)
ICIR 323 The Practice of Diplomacy	4 (4-0-8)
ICIR 332 Comparative Regionalism	4 (4-0-8)
ICIR 334 Terrorism, Counterterrorism and Political Violence	4 (4-0-8)
ICIR 341 Current Issues in International Relations and Global Affairs	4 (4-0-8)

**Global Affairs: Asia and Beyond**

ICIR 212 Social Institutions of the Modern World	4 (4-0-8)
ICIR 214 Perspectives on Thailand	4 (4-0-8)
ICIR 216 Religious Movements and Diversity in Asia	4 (4-0-8)
ICIR 227 Approaches to Culture and Society	4 (4-0-8)
ICIR 228 Europe and the 'West' in the Contemporary World	4 (4-0-8)
ICIR 229 Environment and Natural Resources in Global Affairs	4 (4-0-8)
ICIR 231 Imperial Legacies in Asia	4 (4-0-8)
ICIR 232 Tradition and Modernity Asia	4 (4-0-8)
ICIR 233 Identity Politics and Social Movements in Asia	4 (4-0-8)
ICIR 234 Perspectives on South Asia	4 (4-0-8)
ICIR 235 Strategic Networks in Asia-Pacific	4 (4-0-8)
ICIR 236 Europe Since 1945	4 (4-0-8)
ICIR 324 Society and Technology in the Modern World	4 (4-0-8)
ICIR 325 Migration, Diasporas and the Politics of Space	4 (4-0-8)
ICIR 326 Contemporary China: Global, Regional, and Local Perspectives	4 (4-0-8)
ICIR 327 Ethnicity and Representation in International Affairs	4 (4-0-8)
ICIR 331 Religion and Politics in the Contemporary World	4 (4-0-8)
ICIR 333 Politics of Memory in Asia	4 (4-0-8)
ICIR 342 Current Issues in Asia	4 (4-0-8)

**Final Trimester**

ICIR 401 Internship	12 (0-36-12)
ICIR 402 Senior Thesis	12 (0-0-68)
Three major electives	12 (12-0-24)

**Note I:** Students can substitute alternative electives in the fields of International Relations and World Politics and Global Affairs: Asia and Beyond from other institutions upon approval of the Program Director and the Chair of the Division

**Note II:** Students may choose courses from both International Relations and World Politics and Global Affairs: Asia and Beyond to complete their major elective requirements without restriction.

**Note III:** Students can choose to take 3 additional Major Elective International Relations and Global Affairs courses as a substitute for ICIR 401 and ICIR 402 to complete their major requirements to graduate.

**Free Electives****8 credits**

International Relations and Global Affairs students must select 8 credits of free electives from any of the courses offered by Mahidol University International College. The choice is subject to the approval of the academic advisor.



# TOURISM AND HOSPITALITY MANAGEMENT



Division



# INTERNATIONAL HOSPITALITY MANAGEMENT PROGRAM

## DEGREE OFFERED

**Bachelor of Management**

**(International Hospitality Management)**

**B.M. (International Hospitality Management)**

## There are 3 Modules:

1. Hospitality
2. Tourism
3. Event

## THE FIELD

The tourism and hospitality industry is one of the fastest growing and most dynamic industries in the world. This is especially true in Thailand where this industry has enormous importance for both the public and private sectors. In line with industry needs, the focus of the International Hospitality Management (IHM) major is the critical interface between theory and practice. This is clearly demonstrated by the curriculum's strong managerial and vocational nature, its analytical approach to this global industry and its commitment to sustainable development.

As part of its commitment to both students and industry, MUIC operates its own fully functional hotel and training center, the Salaya Pavilion, where students can gain genuine insight into the running and management of a live hotel and experience real-life situations, guests, functions and events.

At MUIC, the integration of faculty expertise, industry connections and state-of-the-art facilities provides one of the most comprehensive learning and training environments in Asia.

To provide students with a greater range of career options, the International Hospitality Management major provides three areas of interest from which students can choose: 1) Hospitality, 2) Tourism and 3) Event.

### **Hospitality field:**

The Hospitality field focuses on the importance of quality services within hotels, strategic management, service marketing, human resource training and development, food and beverage management, facilities design, and feasibility studies and business development in the industry. Within the field, students are trained within the individual departments of a hotel, and more importantly, they are trained from a managerial perspective. The students also have an opportunity to put management knowledge and theories into practice during their internships with industry practitioners.

### **Tourism field:**

The Tourism field engages students in the areas of tourism business planning and development, product innovation in tourism, destination promotion strategies, creating tourism competitiveness and interpretation of heritage tourism. The module aims to enhance students' analytical skills towards tourism related business planning and development, creating value innovation in tourism business,

strategic development in destination marketing and creating tourism business competitiveness.

#### Event field:

The Event field prepares students for careers in event and MICE management businesses. Within this group, students gain knowledge and experiences in planning, designing, organizing, budgeting and implementing special events, sport events, meetings, incentives, conventions, conferences, exhibitions and expositions. It also provides students with professional preparation, focusing on the concepts and principles involved in event and MICE management, budgets and finance, site selection, contracts, vendors, negotiations, marketing and promotions, food and beverage management, modern technology, hospitality law and event logistics. The event and MICE industry is an exciting, fast-paced field that allows and encourages creativity and innovation.

## CAREER OPPORTUNITIES

According to leading authorities, including the World Tourism Organization (WTO), the Thai Hotels Association (THA) and the Tourism Authority of Thailand (TAT), the tourism and hospitality industry in Thailand has continued to expand in both scope and scale. Therefore, the industry provides unique opportunities for career advancement and professional development. There are significantly increasing demands for graduates in tourism and hospitality programs, who are outstanding in international skills and experiences. Due to the up-to-date knowledge and skills from our tourism and hospitality management curriculum, our graduates are well-equipped with the necessary tools for their work lives, including a high level of English proficiency and practical experience from the national and international internship programs. For more than 20 years, our graduates have become more widely accepted by organizations in the tourism and hospitality industry, not only in Thailand but also in other countries around the world.

MUIC's Tourism and Hospitality Management (THM) Division is now one of the most respected educational institutions in Thailand, aiming to provide training and knowledge for middle and senior management professionals of the future. The THM Division has established excellent links with the tourism and hospitality industry in various sectors (e.g. hotels, airlines, food & beverages, event organizers and tourism organizations) and has a growing national and international reputation for quality in tourism and hospitality education.

- 1) Students will be able to work in private sectors relating to international hospitality industry with focuses on hotel and restaurant, as well as starting their own small and medium business. Set skills and knowledge gained from the curriculum also allow students to have opportunities in other service related business including airline, cruise, spa and hospital.
- 2) Under elective choices, students will be able to work in private/public sectors relating to tourism and event businesses, as well as starting their own small and medium business in tourism. Set skills and knowledge gained from some fundamental courses and elective courses in the curriculum also allow students to have opportunities to pursue tourism related careers namely tour guide, tour operators/agencies, jobs in tourism organisations such as Tourism Authority of Thailand, event organizers or jobs in event organisations such as Thailand Convention and Exhibition Bureau (TCEB).
- 3) Since students are trained for a basic research method course, both on qualitative and quantitative approaches, they are applicable to work in a research field or for market research companies in relation to areas of hospitality and tourism industry.

## CURRICULUM STRUCTURE

Courses	Credits
General Education Courses	39
Core Courses	32
Major Required Courses	40
Major Elective Courses	20
Foreign Language Elective Courses	20
Free Elective Courses	8
Internship Courses	24
<b>Total</b>	<b>183</b>

# COURSE LIST

## Foundation Courses

ICID 100 Freshman Seminar

**Non Credits**

0 (0-1-0)

ICME 100 English Resource Skills

0 (4-0-0)

**Note I:** All students must take ICID 100 Freshman Seminar, a non-credit course.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I

## General Education Courses

**no less than 39 credits**

### English Communication

**16 credits**

ICGC 101 Academic Writing and Research I

4 (4-0-8)

ICGC 102 Academic Writing and Research II

4 (4-0-8)

ICGC 103 Public Speaking

4 (4-0-8)

ICGC 111 Academic Writing and Research I (Advanced)

4 (4-0-8)

ICGC 112 Academic Writing and Research II (Advanced)

4 (4-0-8)

ICGC 201 Global Realities

4 (4-0-8)

ICGC 202 Literary Analysis

4 (4-0-8)

ICGC 203 Creative Writing

4 (4-0-8)

ICGC 204 Advanced Oral Communication

4 (4-0-8)

ICGC 205 Linguistics

4 (4-0-8)

ICGC 206 Literature Into Film

4 (4-0-8)

ICGC 207 Diverse English Speaking Cultures

4 (4-0-8)

ICGC 208 Language and Culture

4 (4-0-8)

ICGC 209 The Story of English

4 (4-0-8)

ICGC 210 First and Second Language Acquisition

4 (4-0-8)

ICGC 211 Topics in Comparative Literature A: Poetry

4 (4-0-8)

ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel

4 (4-0-8)

ICGC 213 Topics in Comparative Literature C: Drama

4 (4-0-8)

**Note I:** All students are required to take the first three courses (12 credits) in the General Education requirement for English without interruption beginning in their first trimester of enrollment. Students may then select any 200+ level English courses to complete their final 4 credits.

**Note II:** Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade "S" before moving to ICGC 101 Academic Writing and Research I.

**Note III:** Based on their achievement on the essay portion of the MUIC entrance exam, some students may be placed into the 'Advanced Track' for their General Education requirement in English. These students will be required to complete only 12 credits in English: ICGC 111 and ICGC 112 in order, and finally, any 200+ level English courses.

### Natural Sciences

**8 credits**

ICGN 102 Essential Mathematics

4 (4-0-8)

ICGN 103 Essential Statistics

4 (4-0-8)

### Humanities

**4 credits**

ICGH 102 Famous Arguments and Thought Experiments in Philosophy

4 (4-0-8)

ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments

4 (4-0-8)

ICGH 104 Moral Reasoning: How can we know what is good?

4 (4-0-8)

ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!

4 (4-0-8)

**Note I:** International Hospitality Management Major students can choose one subject among the four listed subjects.

<b>Social Sciences</b>	<b>8 credits</b>
ICGS 104 Essentials of Entrepreneurship	4 (4-0-8)
ICGS 106 Fashion and Society	4 (4-0-8)
ICGS 107 MICE 101	4 (4-0-8)
ICGS 108 Money Matters	4 (4-0-8)
ICGS 110 Development and Conflicts	4 (4-0-8)
ICGS 112 Geography of Human Activities	4 (4-0-8)
ICGS 118 Skills in Dealing with People Across Cultures	4 (4-0-8)
ICGS 120 Global Awareness	4 (4-0-8)
ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?	4 (4-0-8)

**Note I:** Students can choose two subjects among the listed above.

<b>Physical Education</b>	<b>3 credits</b>
ICGP 101 American Flag Football	1 (0-2-1)
ICGP 102 Badminton	1 (0-2-1)
ICGP 103 Basketball	1 (0-2-1)
ICGP 104 Body Fitness	1 (0-2-1)
ICGP 105 Cycling	1 (0-2-1)
ICGP 106 Discover Dance	1 (0-2-1)
ICGP 107 Golf	1 (0-2-1)
ICGP 108 Mind and Body	1 (0-2-1)
ICGP 109 Selected Topics in Sports	1 (0-2-1)
ICGP 110 Self Defense (Striking)	1 (0-2-1)
ICGP 111 Self Defense (Grappling)	1 (0-2-1)
ICGP 112 Soccer	1 (0-2-1)
ICGP 113 Social Dance	1 (0-2-1)
ICGP 114 Swimming	1 (0-2-1)
ICGP 115 Tennis	1 (0-2-1)
ICGP 116 Volleyball	1 (0-2-1)

<b>Major Courses</b>	<b>112 credits</b>
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<b>Core Courses</b>	<b>32 credits</b>
<b>• Core Courses in Management</b>	
ICHI 201 Principles of Management	4 (4-0-8)
ICHI 301 People and Talent Management	4 (4-0-8)
ICHI 302 Service Management	4 (4-0-8)
<b>• Core Courses in International Hospitality Management</b>	
ICHI 202 Introduction to Hospitality and Tourism Industry	4 (3-2-7)
ICHI 203 Business Communication	4 (4-0-8)
ICHI 204 Digital Technology for Hospitality Industry	4 (4-0-8)
ICHI 205 Consumer Behavior for International Hospitality Management	4 (4-0-8)
ICHI 206 Laws and Ethics for Hospitality and Tourism	4 (4-0-8)

<b>Required Courses</b>	<b>40 credits</b>
ICHI 211 Hospitality and Tourism Managerial Economics	4 (4-0-8)
ICHI 212 Accounting for International Hospitality Management	4 (4-0-8)
ICHI 213 Principles of Marketing	4 (4-0-8)
ICHI 311 Sustainable Development in Hospitality and Tourism	4 (4-0-8)
ICHI 312 Crisis and Risk Management for Hospitality Industry	4 (4-0-8)
ICHI 313 Hospitality Branding and Marketing Communications	4 (4-0-8)
ICHI 314 Finance for International Hospitality Management	4 (4-0-8)
ICHI 411 Revenue Management for Hospitality Industry	4 (4-0-8)
ICHI 412 Entrepreneurship and Strategic Management for International Hospitality Management	4 (4-0-8)
ICHI 413 Research Methods for International Hospitality Management	4 (4-0-8)
<b>Major Elective Courses</b>	<b>20 credits</b>
<b>Hospitality</b>	
ICHI 221 Culinary Arts	4 (3-2-7)
ICHI 222 Baking and Pastry Business	4 (3-2-7)
ICHI 321 Lodging Property Management	4 (4-0-8)
ICHI 322 Hospitality Facilities Design	4 (3-2-7)
ICHI 323 Front Office Management	4 (4-0-8)
ICHI 324 Housekeeping Management	4 (4-0-8)
ICHI 325 Food and Beverage Management	4 (4-0-8)
ICHI 326 Spa and Health Resort Management	4 (4-0-8)
<b>• Tourism</b>	
ICHI 331 Tour Guiding and Heritage Interpretation	4 (3-2-7)
ICHI 332 Tour Package Management	4 (3-2-7)
ICHI 333 Wine Studies and Wine Tourism	4 (3-2-7)
ICHI 334 Airline Management	4 (4-0-8)
ICHI 335 Social Media Management for Tourism Business	4 (4-0-8)
ICHI 336 Cultural Heritage Management	4 (4-0-8)
ICHI 337 Tourism in ASEAN Countries	4 (4-0-8)
<b>• Event</b>	
ICHI 341 Event Management Fundamentals	4 (4-0-8)
ICHI 342 Event Project Management	4 (3-2-7)
ICHI 343 Sport Event Management	4 (3-2-7)
ICHI 344 Special Topics	4 (4-0-8)
ICHI 345 Event and Experience Design	4 (3-2-7)
<b>Elective Foreign Language Courses</b>	<b>20 credits</b>
<b>• Japanese for Hospitality and Tourism Industry Module</b>	
ICHL 101 Japanese I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 102 Japanese II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 103 Japanese III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 104 Japanese IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 105 Japanese V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 106 Japanese VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 107 Japanese VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 108 Japanese VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 109 Japanese IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 110 Japanese X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 111 Japanese XI for Hospitality and Tourism Industry	4 (4-0-8)

**• Chinese for Hospitality and Tourism Industry Module**

ICHL 121 Chinese I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 122 Chinese II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 123 Chinese III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 124 Chinese IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 125 Chinese V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 126 Chinese VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 127 Chinese VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 128 Chinese VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 129 Chinese IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 130 Chinese X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 131 Chinese XI for Hospitality and Tourism Industry	4 (4-0-8)

**• French for Hospitality and Tourism Industry Module**

ICHL 141 French I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 142 French II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 143 French III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 144 French IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 145 French V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 146 French VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 147 French VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 148 French VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 149 French IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 150 French X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 151 French XI for Hospitality and Tourism Industry	4 (4-0-8)

**• German for Hospitality and Tourism Industry Module**

ICHL 161 German I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 162 German II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 163 German III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 164 German IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 165 German V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 166 German VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 167 German VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 168 German VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 169 German IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 170 German X for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 171 German XI for Hospitality and Tourism Industry	4 (4-0-8)

**• Spanish for Hospitality and Tourism Industry Module**

ICHL 181 Spanish I for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 182 Spanish II for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 183 Spanish III for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 184 Spanish IV for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 185 Spanish V for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 186 Spanish VI for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 187 Spanish VII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 188 Spanish VIII for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 189 Spanish IX for Hospitality and Tourism Industry	4 (4-0-8)
ICHL 190 Spanish X for Hospitality and Tourism Industry	4 (4-0-8)

ICHL 191 Spanish XI for Hospitality and Tourism Industry

4 (4-0-8)

**Note:** Students are required to take five sequential courses in one of the foreign languages. Courses level placement is based on the results of placement exam given by MUIC.

**Internship Courses**

**24 credits**

ICHI 391 Internship I (Hotel Operation)

12 (0-36-12)

ICHI 392 Internship I

12 (0-36-12)

ICHI 491 Internship II

12 (0-36-12)

**Free Elective Courses**

**8 credits**

Students can take any courses offered by Mahidol University and Mahidol University International College as a free elective course with an approval of the advisor.



# **COURSE DESCRIPTIONS**



- EGCI 100 Introduction to Computer Engineering** 1 (0-2-1)  
**Prerequisites:** -  
Introduction to computer engineering. Computer systems. Hardware and Software. Operating System Open-source technology: Linux. Fundamental of computer network. Internet and World Wide Web (WWW). Practical exercises with Office application. Introduction to computer programming.
- EGCI 111 Computer Programming** 4 (3-2-7)  
**Prerequisites:** -  
Introduction to computer concepts, computer components, hardware and software, hardware and software interaction, and Electronic Data Processing (EDP) concepts. Introduction to program design and implementation using a high-level language: types and expressions, iterative and conditional control statements, functions, Boolean logic, array and record structures, pointers, and introduction to recursion.
- EGCI 200 Engineering Mathematics** 4 (4-0-8)  
**Prerequisite:** ICMA 215  
Ordinary Differential Equations of the first and second order; Laplace Transform and its application to solve differential equations; Linear Algebra including operations with matrices, determinants, eigenvalue problem and diagonalization; Vector Differential Calculus.
- EGCI 201 Discrete Mathematics** 4 (4-0-8)  
**Prerequisite:** -  
Basic set theory, mathematical reasoning, relations, functions, graphs, trees, introduction to number theory.
- EGCI 204 Engineering Mechanics** 4 (4-0-8)  
**Pre-requisite:** ICPY 132  
Force system; resultant; equilibrium; fluid statics; kinematics and kinetics of particles and rigid bodies; Newton's second law of motion.
- EGCI 205 Numerical Methods for Engineers** 4 (4-0-8)  
**Prerequisite:** EGCI 111  
General principles of numerical calculations; accuracy estimation in numerical calculations; roots of polynomial and nonlinear functions; systems of linear algebraic equations; interpolation; differentiation and integration; numerical solution of ordinary differential equations; Fourier methods; curve fitting and approximation of functions; Optimization; application of numerical methods for engineering problems.
- EGCI 206 Engineering Mathematics II** 4 (4-0-8)  
**Prerequisite:** ICMA 215  
Basic complex analysis, Probability and random variables; Gaussian process, Ergodic process, Mathematics for linear systems; Superposition, Convolution, Fourier Analysis; Discrete time Fourier transform (DTFT), Z-transform and Inverse Z-transform.
- EGCI 212 Programming Techniques** 4 (4-0-8)  
**Prerequisite:** EGCI 111  
Programming techniques and concepts. Various techniques for Efficient Programming, Software-Bug Prevention, Debugging, Testing, and Source-Code Maintenance. Scope/Lifespan of variables, Pointers, Data Abstraction, Error Handling, and Object-Oriented Programming Concept.
- EGCI 213 Programming Paradigms** 4 (4-0-8)  
**Pre-requisite:** EGCI 212  
Introduction to programming paradigms and programming languages; fundamental programming concepts: data types, basic programming statements, functions, memory management; object oriented programming, concurrent programming, event-driven programming.

**EGCI 221 Data Structures and Algorithms****4 (4-0-8)****Pre-requisite:** EGCI 111

Analysis of algorithms; abstract data type; linear data structures: linked lists, stacks, queues; nonlinear data structures: trees, hash tables, graphs; sorting and searching algorithms; recursion, divide and conquer, dynamic programming, greedy algorithms; introduction to NP-completeness.

**EGCI 230 Electric Circuit Analysis****4 (4-0-8)****Pre-requisite:** EGCI 206

Circuit elements; Kirchhoff's laws and reference direction; elementary concepts of network graphs; resistive circuits; node and mesh analysis; Thevenin theorem and Norton theorem; Op-amp, inductor and capacitor, first-order and second order circuit; step responses; zero input and zero-state responses; DC transient and AC steady-state response; elementary transfer functions; sinusoidal waveforms; phasor representations; impedance and admittance; sinusoidal steady-state analysis; complex power; frequency response.

**EGCI 232 Engineering Electronics****4 (3-2-7)****Pre-requisite:** -

Introduction to solid-state electronics as circuit elements, including diodes, bipolar transistor, rectifier circuits, Zener diodes regulators, power supplies, power amplification, MOSFETs, applications in operational amplifiers in various feedback configurations.

**EGCI 233 Digital Circuit Design Lab****1 (0-2-1)****Co-requisite:** EGCI 234

Laboratory experiments related to EGCI 234 course. Examples of included experimental topics are Introduction to Digital Systems Lab, Basic Gates' Operations, Boolean algebra, Design of Adder and Subtractor Circuits, Encoder and Decoder Circuits, Multiplexer and Demultiplexer Circuits, Design of Sequential Circuits.

**EGCI 234 Digital Circuit Design****4 (4-0-8)****Pre-requisite:** -

Digital Circuit Design, Basic Gates, Boolean Algebra, Combination Logic Circuit Design (e.g. Decoder, Encoder, Multiplexer, and Comparator circuits), Logic Minimization, Number Systems, Binary Codes, Flip Flops and register, Counter Circuits, Synchronous and Asynchronous Circuit Design, A/D and D/A converters, Memory Organization.

**EGCI 252 System Programming****4 (4-0-8)****Pre-requisite:** -

Students will be introduced the basic concepts of system programming. Fundamental concepts in process management, concurrency and communication will be described including signals, thread, and thread synchronization, semaphores, Inter-Process Communication.

**EGCI 301 Computer Graphics****4 (4-0-8)****Pre-requisite:** EGCI 111

Principles of computer graphics, graphics systems and models, graphics programming, graphic devices and their controls, color model, geometric objects and transformations, viewing, shading, clipping, and hidden-surface removal.

**EGCI 305 Statistics for Research in Computer Engineering****4 (4-0-8)****Pre-requisite:** ICMA 215

The design of experiments and the methods for collection and presentation of data; descriptive statistics; elementary probability and normal distributions; estimation of parameters; hypothesis testing; analysis of variance; regression and correlation analysis of frequencies and non-parametric methods.

- EGCI 312 Professional Practices I** **1 (0-2-1)**  
**Pre-requisite:** -  
Introduction to Matlab/Octave, Programming environment in Matlab, commands, variables. Matrices and vectors. Loops, conditions, scripts, user-defined functions.
- EGCI 313 Professional Practices II** **1 (0-2-1)**  
**Pre-requisite:** -  
Study and develop skills to utilize modern technology in Computer: hardware and software, Open-Source technology, Communication technology, Computer graphic tools, Microprocessor interfacing techniques, input/output, and peripheral devices. I/O technology and intelligent system and other relevant topics.
- EGCI 319 Internship In Computer Engineering** **2 (0-12-2)**  
**Pre-requisite:** -  
Practical training in an industrial factory or an organization with computer-related systems, computer control system, or systems using computer processing. The training with the minimum period of 144 hours. Students must present a paper to the department, including the report of the training outcome from the employer.
- EGCI 321 Database Systems** **4 (4-0-8)**  
**Pre-requisite:** -  
Data model: entity-relationship, relational. Logical and Physical database design, Query Language, Data Dependencies and Normalization, Transaction, Crash Recovery, Concurrency control, Internet Databases.
- EGCI 330 Microprocessor and Interfacing** **4 (4-0-8)**  
**Pre-requisite:** -  
Introduction to microprocessor, microprocessor architecture and instruction set, addressing modes, assembly language, memory interfacing, interrupts & DMA, interfacing with I/O devices, microprocessor's interfacing programming and applications.
- EGCI 331 Introduction to IC Design** **4 (4-0-8)**  
**Pre-requisite:** EGCI 234  
N MOS and C MOS integrated circuit technologies; properties of N MOS and C MOS circuits; calculation of parameters in circuits, static and dynamic MOS circuits; system design; circuit drawing and testing; computer arithmetic; performance evaluation; synthesis of digital circuits from HDL models; modeling and simulation; fault models and testing the use of CAD tools in circuit design.
- EGCI 332 Embedded Systems** **4 (4-0-8)**  
**Pre-requisite:** -  
Embedded system design and development process; portable battery operated embedded systems; high-level language programming for embedded system applications; real-time operating system; advanced peripheral interfacing; DAC and ADC converters; Sensors and signal conditioners.
- EGCI 333 Computer Architecture** **4 (4-0-8)**  
**Pre-requisite:** EGCI 234  
Computer components: design of logic circuits; working of and designing register level components used in computer systems; data representation in computer systems; clock signal; datapath design; design of control unit using microprogram (CISC architecture) and logic circuit (RISC architecture); working of computer of each architecture; performance enhancement; pipeline systems of computer; memory systems; principles and working of cache memory; input-output system design; fundamentals of serial and parallel communication; parallel processing architecture. Fault tolerance.

- EGCI 341 Software Engineering** 4 (4-0-8)  
**Pre-requisite:** EGCI 321  
Software life cycle; need and specification; large-scale software development; scheduling, developing, constructing, testing and maintenance of software system; object-oriented analysis and design; software reuse; documentation; management of software project; case study of software system in the market.
- EGCI 351 Operating Systems** 4 (4-0-8)  
**Pre-requisite:** EGCI 252  
Contemporary concepts of computer operating systems; Thread; CPU scheduling; definition and details of harmonizing cooperating process; system resources management; deadlock handling; main memory management and design; virtual memory management; auxiliary memory management; file systems; protection and security; introduction to distributed operating systems.
- EGCI 372 Data Communication and Computer Networks** 4 (4-0-8)  
**Pre-requisite:** -  
Introduction to data communication. Network Topology. OSI and TCP/IP model. Ethernet Fundamental. Principle of physical layer. Principle of data transmission and data link control protocol. Circuit Switching and Packet Switching. Principle of transport layer. Principle of network layer. Routing fundamentals and protocol. TCP/IP protocol and IP addressing. Application layer and wireless network.
- EGCI 400 Morals and Ethical Studies for Computer Engineers** 1 (1-0-2)  
**Pre-requisite:** -  
History and overview; public policy; methods and tools of analysis, professional and ethical responsibilities; risks and liabilities; intellectual properties; privacy and civil liberties; computer crime and economic issues for computer engineering.
- EGCI 404 Theory of Computation** 4 (4-0-8)  
**Pre-requisite:** EGCI 201  
Introduction to structure of languages and characteristic of languages: formal languages, regular languages and non-regular languages, context-free grammar and context-free languages. Describe the characteristic of state machines that are used to check the membership of languages: finite state machines, transducers, state transition machines, non-deterministic finite state machines, push-down state machines, Turing machines. Advanced theory of computation: Kleene's theorem, recursively enumerable languages, decision problems.
- EGCI 406 Mechatronics** 4 (3-2-7)  
**Prerequisites:** -  
Microcontroller; digital input/output; switches and LEDs; analog input/output; PWM signal; switching devices; relays; motors; H-bridge; serial communication; power supply; sensors; PCB design; feedback control
- EGCI 425 Data Mining** 4 (4-0-8)  
**Pre-requisite:** -  
Knowledge discovery in database; data preparation, data visualization, and data transformation; clustering, association analysis, classification and ensembled classification; metrics and evaluation; data warehouse, online analytical processing (OLAP); effects of data mining, current technology and trend, applications of data mining.
- EGCI 427 Web Programming** 4 (4-0-8)  
**Pre-requisite:** -  
Semi-structured data models for the Web (such as XML, etc.), semi-structured data management, associated query languages and query systems for Web data, query processing and optimization over semi-structured data as well as over multiple distributed sources. Data integration over the Web, warehousing of Web data. Mappings from relational and object-oriented database servers to web data. Discussion on some novel data-intensive applications on the Web such as electronic commerce, digital libraries, and distance education relating to web database issues.

- EGCI 428 Mobile Device Programming** 4 (4-0-8)  
**Pre-requisite:** -  
Fundamental of the mobile device programming; concept of mobile device technology; basic mobile device programming; user-interface design; database connection; remote sensors controlling; mobile web services; Develop a prototype for the mobile device application for with notification services.
- EGCI 429 Web Application Architecture** 4 (4-0-8)  
**Pre-requisite:** -  
Fundamental concepts of Web application development from a managerial perspective; extensible Markup Language (XML) and Hypertext Markup Language (HTML) technology; fundamental principles of architecture, process, and elements of Web applications; Web services application development; mobile applications such as geographical information system and social networks.
- EGCI 432 Distributed Systems** 4 (4-0-8)  
**Pre-requisite:** EGCI 111  
Naming, consistency, concurrency, and security and reviews some of the current best practices in distributed computing models: peer-to-peer, grid computing, and distributed object model.
- EGCI 461 Artificial Intelligence** 4 (4-0-8)  
**Pre-requisite:** -  
Foundations of artificial intelligence, solving problems by searching, knowledge representation, first order logic, inference in first-order logic, planning, probabilistic reasoning systems, introduction to Prolog, natural language processing, genetic algorithm, and machine learning techniques.
- EGCI 463 Pattern Recognition** 4 (4-0-8)  
**Pre-requisite:** Consent of instructor  
Preprocessing for data recognition: features extraction, classification or linear techniques for recognition. Parametric and nonparametric techniques, Bayesian classifiers, methods, neural networks, hybrid method, learning techniques. Applications in pattern recognition.
- EGCI 465 Fuzzy Sets and Neural Networks** 4 (4-0-8)  
**Pre-requisite:** EGCI 201  
Basic principles of fuzzy logic, fuzzy numbers, fuzzy sets, fuzzy relations, fuzzy rules and reasoning, fuzzy inference systems, fuzzy system design, structure and characteristic of various artificial neural networks, supervised and non-supervised learning, classification, fuzzy techniques and neural networks application in engineering.
- EGCI 467 Natural Language and Speech Processing** 4 (4-0-8)  
**Pre-requisite:** -  
Algorithms for the processing of linguistic information, computational properties of natural languages. Morphological, syntactic, and semantic processing from a linguistic and an algorithmic perspective, modern quantitative techniques in NLP: using large corpora, statistical models for acquisition, and representative systems.
- EGCI 474 Internetworking Technologies I** 4 (3-2-7)  
**Pre-requisite:** Consent of instructor  
Theoretical and practical aspects of routing, including internetworking models, internet protocol, and routing technologies. Laboratory work is required.
- EGCI 475 Internetworking Technologies II** 4 (3-2-7)  
**Pre-requisite:** EGCI 474  
Theoretical and practical aspects of advanced routing and switching technologies, including Hierarchical Network Design Model, Layer 2 Switching, Internet Protocol version 6, Spanning Tree Concepts, Inter-VLAN, WAN Technologies, Network Security, Network Services, and Network Troubleshooting. Laboratory work is required.

- EGCI 476 Cryptography and Computer Security** **4 (4-0-8)**  
**Pre-requisite:** -  
 Introduction to basic theory and techniques in cryptography. Symmetric and Asymmetric encryption. Cryptanalysis techniques. Security in computer network. Security threats and Vulnerabilities. Authentication mechanisms. Identification schemes. Security in operating system and application. Firewall, Intrusion Detection system.
- EGCI 477 Penetration Testing and Prevention** **4 (4-0-8)**  
**Pre-requisite:** -  
 Process of penetration testing. Collection and analysis of computer network vulnerabilities. Tools for penetration testing. Ethics of penetration testing processes. Summarizing and reporting the result from penetration testing. Planning and Design of prevention systems to protect computer network form vulnerabilities.
- EGCI 486 Image Processing** **4 (4-0-8)**  
**Pre-requisite:** Consent of instructor  
 Image processing systems, Introduction to digital image processing, Digital image fundamentals, Image Enhancement, Image Transformation, Image Restoration, Color image processing, Image compression, Morphological image processing, Image segmentation, Object recognition.
- EGCI 491 Project Seminar** **1 (0-2-1)**  
**Pre-requisite:** Consent of instructor  
 Write a project proposal for an approved topic, for further research and implementation in the Computer Engineering Project course.
- EGCI 492 Computer Engineering Project** **2 (0-4-2)**  
**Pre-requisite:** EGCI 491  
 The computer engineering project supervised by the faculty. Students complete the project. A complete project report and an oral examination is required.
- EGCI 493 Cooperative Education** **8 (0-40-8)**  
**Pre-requisite:** -  
 Integrate and adapt all classroom knowledge into real practice in corporate environment, gain working experience and teamwork experience under supervision of mentors from the companies and advisors from the department, in order to prepare the students from transition from school to work after graduation.
- EGCI 494 Fundamental of Digital Forensics** **4 (4-0-8)**  
**Pre-requisite:** -  
 Introduction to basic of digital forensics. Data Collection and Investigation from Operating System such as Windows and Unix. Computer files system storage. Collecting and analyzing network traffic. Data analysis and validation. Digital Forensic Tools.
- ICBE 346 Public Economics** **4 (4-0-8)**  
**Prerequisite:** ICMB 203  
 Welfare economics theory, public policy analysis, public goods, the distribution of income and wealth, analysis of taxation.
- ICBE 371 Strategic Choices of Consumers and Firms** **4 (4-0-8)**  
**Prerequisite:** ICMB 205  
 A study of the behaviour of economic agents, individual and market demands, optimal choices, market structures, the collusion and cartels analysis; game theory, interaction of consumers and firms, partial and general equilibrium analysis, government intervention, market failures and externalities

- ICBE 372 World Economy** **4 (4-0-8)**  
**Prerequisite:** ICMB 205, ICMB 206  
 The international trade theory, the international trade policy, current issues of international trade, the international finance theory; fixed exchange rate, flexible exchange rate, macroeconomic policy under the different exchange rate systems, the role of international financial institutions
- ICBE 373 Econometrics and Data Analysis** **4 (4-0-8)**  
**Prerequisite:** ICMB 201, ICMB 205, ICMB 206  
 An introduction to the field of econometrics; the simple regression analysis; the multiple regression analysis; hypothesis testing; dummy variables; proxy variables; the linear probability models; panel data models; applications of econometric methods to actual data using the econometric software packages
- ICBE 471 Markets Structures and Pricing Strategies** **4 (4-0-8)**  
**Prerequisite:** ICMB 205, ICMB 206  
 Firms behavior, different market structures, an economic analysis of game theory, firms decisions, competitive market, monopolistic and imperfect competitive markets; theory of pricing decision, pricing issues, pricing framework, value creation process, price structure, strategies and tactics; strategic firms entering mode, differentiate product, choice of vertical boundaries and procurement decisions, and the advertising investment
- ICBE 472 Economic Policy Analysis** **4 (4-0-8)**  
**Prerequisite:** ICMB 205, ICMB 206  
 Welfare economics theory; public goods; the distribution of income and wealth; an analysis of taxation; public policy analysis; monetary theory and policy; transmission of monetary policy; central bank operations; an evolution of monetary institutions
- ICBE 481 Game Theory for Business** **4 (4-0-8)**  
**Prerequisite:** ICMB 205  
 An application of game theoretic models to strategic situations, static games, dynamic games, sequential games; the role of complete and incomplete information, repeated interactions, behavioral games
- ICBE 482 Economic Integration** **4 (4-0-8)**  
**Prerequisite:** ICMB 206  
 Theories, applications and effects of the economic integration; free trade areas; customs unions; common markets; the labor and capital mobility; economic union; monetary and fiscal unions; trade policy measures; current issues and challenges of the WTO, the European Union, ASEAN, APEC, NAFTA, and TPP
- ICBE 483 Time Series Analysis for Business Forecasting** **4 (4-0-8)**  
**Prerequisite:** ICBE 373  
 An introduction to the time series analysis; the autoregressive (AR) model; moving average (MA) model; the autoregressive moving average (ARMA) model; trends; seasonality; the ARCH model; the GARCH model; the VAR/VECM models; cointegration; forecasting; applications of time series methods to actual (financial) time series data using the econometric software packages
- ICBE 486 Special Topics in Business Economics** **4 (4-0-8)**  
**Prerequisite:** Juniors  
 A study of contemporary issues, industry trends, theories, and best practices in business economics in response to the changing business environment
- ICBI 101 Biology** **4 (4-0-8)**  
**Prerequisites:** -  
 Properties of life, classification, and scientific process; chemistry of life; cells and metabolism; genetics; mechanisms of evolution

<p><b>ICBI 102 Integrated laboratory in Biological Sciences I</b></p> <p><b>Prerequisites:</b> - Cell structure and function; tissue; cell division; ecology; movement of molecules; respiration and photosynthesis</p>	<p><b>2 (0-4-2)</b></p>
<p><b>ICBI 103 Biology II</b></p> <p><b>Prerequisite:</b> - Diversity of life; plant forms and functions; animal forms and functions; ecology and behavior</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICBI 204 Developmental Biology</b></p> <p><b>Prerequisites:</b> ICBI 221 Animal Biology Embryogenesis; molecular and cellular aspects of differentiation morphogenesis in a variety of vertebrates and invertebrates; comparative study of normal and deviate development in well-known mammals</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICBI 207 Ethics for Bioscience</b></p> <p><b>Prerequisites:</b> ICBI 101 Biology, ICBI 103 Biology II Ethical issues in research in various fields of biology; publication and plagiarism; experiments and research involving human volunteers and experimental animals; medical practice, design of field and clinical trials</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICBI 211 Genetics and Molecular Biology I</b></p> <p><b>Prerequisite:</b> ICBI 101 Biology An introductory course to genetics and molecular biology that focuses on genes/chromosome as inheritable elements; processes of mitosis and meiosis; DNA mutations; Mendelian genetics and central dogma</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICBI 214 General Microbiology</b></p> <p><b>Prerequisites:</b> ICBI 103 Biology II <b>Co-requisite:</b> ICBI 271 General Microbiology Laboratory Structure, physiology and ecology of viruses, bacteria, protozoa and fungi especially bacteria, aspects of microbiology importance in health, sanitation, food processing and industry</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICBI 215 General Biochemistry</b></p> <p><b>Prerequisites:</b> ICBI 101, ICCH 210, ICCH 211, ICCH 221 <b>Co-requisite:</b> ICBI 272 General Biochemistry Laboratory Structure and function of biomolecules, controls and processes of metabolism at the cellular and molecular levels</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICBI 216 Cell Biology</b></p> <p><b>Prerequisites:</b> ICBI 215 General Biochemistry Analysis of the structures and functions of cellular organelles; cellular activities; cell-to-cell interaction and communication with environment</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICBI 221 Animal Biology</b></p> <p><b>Prerequisites:</b> ICBI 103 Biology II A survey of the animal kingdom; diversity and ecology of animal; animal structure, function and behavior; demonstration and practical exercises included</p>	<p><b>4 (3-2-7)</b></p>
<p><b>ICBI 231 Plant Biology</b></p> <p><b>Prerequisites:</b> ICBI 103 Biology II A survey of plant kingdom; diversity and ecology of plants; plant structure, function and behavior; demonstration and practical exercises included</p>	<p><b>4 (3-2-7)</b></p>



- ICBI 261 Ecology and Conservation** 4 (4-0-8)  
**Prerequisites:** ICBI 101 Biology  
**Prerequisites:** No Prerequisites **\*\**(For Environmental Science Students ONLY)\*\****  
 Living things and their environment; ecosystems and natural cycles; human intervention, technological progress and ecological balance; ecological and genetic basis for conservation of species, population, and communities; practical exercises and field trips are included.
- ICBI 262 Practical Field Ecology and Conservation** 4 (3-2-7)  
**Prerequisite:** ICBI 103 Biology II  
 Reviewing ecological literature; formulating research questions; preparing for ecological investigations; characterizing sites; sampling strategies in different habitats; statistical techniques; objective interpretation of data; unambiguous communication of results; field work included
- ICBI 271 General Microbiology Laboratory** 2 (0-4-2)  
**Prerequisite:** ICBI 102 Integrated Laboratory in Biological Sciences I  
**Co-requisite:** ICBI 214 General Microbiology  
 Basic Techniques in microbiological experiments; microscopic examination of microbial cells and spores; simple staining; Gram staining; colony morphology; viable cells count; hemacytometer; cultivation on liquid and solid media; bacteria identification using selective and differential media
- ICBI 272 General Biochemistry Laboratory** 2 (0-4-2)  
**Prerequisite:** ICCH 224 Integrated Laboratory Techniques in Chemistry I  
**Co-requisite:** Taking along with ICBI 215 General Biochemistry  
 Buffer and buffering efficiency; spectrophotometry; starch hydrolysis; biochemical method for determination of cholesterol concentration, amino acid and protein; enzyme assay; fermentation; protein purification; DNA gel electrophoresis
- ICBI 301 Functional Histology** 4 (3-2-7)  
**Prerequisites:** ICBI 221 Animal Biology, ICBI 102 Integrated Laboratory in Biological Sciences I  
 Microscopic characteristics of cells, tissues, and organs of the human body; systematic and sequential consideration of fundamental cytology; normal histology of basic tissues; embryological development and microscopic organization of the major organs and organ systems
- ICBI 303 Basic Immunology** 4 (4-0-8)  
**Prerequisites:** ICBI 214 General Microbiology, ICBI 216 Cell Biology  
 Current understanding of the cellular and molecular interactions in the inductions, expression, and regulation of the cellular and humeral immune responses; recent knowledge and applications concerning immunity to various microbial infections as well as antigen-antibody interactions; serodiagnosis and detection of cell-mediated immune response
- ICBI 305 Human Anatomy I** 4 (2-4-6)  
**Prerequisites:** ICBI 103 Biology II  
 Human anatomy function laboratory exercises are dissections of human cadavers: head, neck, back, anterior chest wall and upper limb
- ICBI 306 Human Anatomy II** 4 (2-4-6)  
**Prerequisites:** ICBI 305 Human Anatomy I  
 Human anatomy and function; laboratory exercises are dissections of human cadavers: thorax, abdomen, pelvis, perineum and lower limb

- ICBI 307 Nutrition and Dietetics** 4 (4-0-8)  
**Prerequisites:** ICBI 215 General Biochemistry  
Importance of food and nutrients for good health; significance of physiological, biochemical and sociological factors of nutritional requirements; practical application of food and nutrition to diet planning and implementation suited to vulnerable groups and individual therapeutic needs
- ICBI 309 Pathobiology** 4 (3-2-7)  
**Prerequisites:** ICBI 216 Cell Biology  
Pathophysiological mechanism of diseases; cell injury and cell death; inflammation and repair; bacterial, viral, fungal and parasitic infections; disturbances of minerals and pigments; disorders of immune response; disturbance of body fluid and blood flow; fever and hypothermia; cellular differentiation and neoplasia; practical exercises included
- ICBI 311 Human Physiology** 4 (3-2-7)  
**Prerequisites:** ICBI 215 General Biochemistry, ICBI 216 Cell Biology  
Function and control mechanisms of nervous, muscular, circulatory, respiratory, excretory, digestive, endocrine and reproductive systems; their interrelationships in homeostasis; demonstration and practical exercise included
- ICBI 315 Microbial Physiology and Genetics** 4 (4-0-8)  
**Prerequisites:** ICBI 214 General Microbiology  
Microbial growth; metabolism; microbial structures and functions; gene structure regulation of microbial metabolism; microbial genetic structure; maintenance, expression, and exchange of genetic materials in microbial cells
- ICBI 316 Environmental Microbiology** 4 (3-2-7)  
**Prerequisites:** ICBI 214 General Microbiology  
Fundamental aspect of microbial physiology and ecology; influence of environment on microorganisms; effect of microbial metabolic processes on the environment, biogeochemical cycle, microbial activity in augmentation
- ICBI 325 Special Topics in Bioinformatics and Molecular Genetics** 4 (4-0-8)  
**Prerequisites:** ICBI 211 Genetics and Molecular Biology I  
Exploration of specific topics in bioinformatics and molecular genetics and/or a specific sub discipline in bioinformatics; class/group discussion on peer-review articles
- ICBI 328 Essential Pharmacology** 4 (4-0-8)  
**Prerequisites:** ICBI 215 General Biochemistry, ICBI 311 Human Physiology  
Basic Knowledge regarding the use of drugs and chemical to treat diseases, drug metabolism, mechanism of drug actions in the body, indication contraindication caution in using drugs to treat diseases; a study of adverse drug reaction, drug interaction, pharmacokinetics, pharmacodynamics; basics of how drugs are used to treat diseases of the nervous system, respiratory system, cardiovascular system, infectious diseases and endocrine system integrated with basic knowledge in physiology, immunology, bacteriology, virology, biochemistry, molecular biology, metabolic and biotransformation both in normal and diseased states
- ICBI 324 Introduction to Medical Toxicology** 4 (4-0-8)  
**Prerequisites:** ICBI 215 General Biochemistry, ICBI 311 Human Physiology  
The process of illness and disease as it pertains to the human exposure to drugs, chemicals, gases and heavy metal in non-therapeutic situations, both accidental and intentional and the biotransformation of drugs and chemicals during these situations; basics of life support measures in poisoned patients, skin and gastric decontamination procedures; indications and mechanism of action of specific antidote, enhance elimination: management of chemical hazardous material incidents and mass casualty events involving toxic chemicals

- ICBI 332 Medical Microbiology** 4 (4-0-8)  
**Prerequisites:** ICBI 214 General Microbiology, ICBI 215 General Biochemistry  
 The nature and epidemiology of infectious disease and the role of microorganisms in health and disease; clinical effects of microbial infection on the human host, microorganisms commonly encountered by physician assistants in clinical practice
- ICBI 341 Neurobiology** 4 (3-2-7)  
**Prerequisites:** ICBI 101 Biology, ICBI 103 Biology II  
 Developmental neurobiology, neuroanatomy, and neurophysiology, some clinical aspects as the results of neuropathological defects or lesions; practical exercises included
- ICBI 372 Utilization of Water and Wastewater Treatment** 4 (3-2-7)  
**Prerequisites:** ICBI 103 Biology II  
 Principles and methods in treatment and utilization of water and wastes; basic concepts of water and wastewater treatment; treatment of wastes from food and beverage industries
- ICBI 380 Introduction to Systems Biology and Bioinformatics** 4 (4-0-8)  
**Prerequisite:** ICBI 211 Genetics and Molecular Biology I, ICMA 252 Biological Statistics Laboratory or ICCS 161 Introduction to Data Science  
 An introduction to computational and mathematical modeling of complex interaction within biological systems; biological databases; information archiving and retrieval and tools for molecular sequence analysis
- ICBI 381 Evolutionary Biology** 4 (4-0-8)  
**Prerequisites:** ICBI 211 Genetics and Molecular Biology, ICBI 215 General Biochemistry  
 Natural selection; molecular evolution; evolutionary genomics; species and speciation; taxonomy and phylogeny; macroevolution; evolution, coevolution and radiation; biogeography; evolutionary biology and ecology; evolutionary biology and conservation
- ICBI 382 Systematic Biology and Biodiversity** 4 (4-0-8)  
**Prerequisites:** ICBI 381 Evolutionary Biology  
 Classification and Taxonomy of all living organisms into kingdom, phylum, class, order, family, genus Theory and procedures of classical and modern systematic analysis in botanical or zoological systems, based on either morphological or molecular characters; introduction to phylogenetic construction and analysis; character construction and weighting; characters in molecular systematics; ways of evaluating the quality of systematic results in morphological and molecular data; the comparative method; cladistic biogeography; coevolution; species concepts; classification and the nomenclatorial codes
- ICBI 385 Freshwater Ecology and Conservation** 4 (4-0-8)  
**Prerequisites:** ICBI 262 Practical Field Ecology and Conservation OR At the discretion of the instructor  
**Co-requisites:** ICBI 386 Practical Freshwater Ecology and Conservation  
 Adaptations; behavior; diversity; physiology; ecological roles; trophic interactions; diversity and productivity; influence of catchment; human activities; significance of global climate changes; increasing competition for water resources; sustainable management; conservation measures
- ICBI 386 Practical Freshwater Ecology and Conservation** 2 (0-4-2)  
**Prerequisites:** ICBI 262 Practical Field Ecology and Conservation OR At the discretion of the instructor  
 Laboratory procedures; field techniques; measuring abiotic conditions; surveying biotic communities; assessing trophic interactions; headwater streams; floodplains; standing waters; evaluating anthropogenic impacts; rehabilitation & restoration; water resource conservation
- ICBI 387 Terrestrial Ecology and Conservation** 4 (4-0-8)  
**Prerequisites:** ICBI 262 Practical Field Ecology and Conservation OR At the discretion of the instructor  
**Co-requisites:** ICBI 388 Practical Terrestrial Ecology and Conservation  
 Adaptations; behaviour; diversity & productivity; physiology; ecological roles; trophic interactions; ecosystems and resources; land-use change; anthropogenic activities; sustainable management; significance of global climate change; conservation measures

- ICBI 388 Practical Terrestrial Ecology and Conservation** **2 (0-4-2)**  
**Prerequisites:** ICBI 262 Practical Field Ecology and Conservation OR At the discretion of the instructor  
 Laboratory and field procedures; experimental design; mapping habitats; measuring abiotic conditions; analysing biotic communities; diversity indices; similarity indices; biotic interactions; behaviour; evaluating anthropogenic impacts; habitat reconstruction; conservation
- ICBI 391 Health Psychology** **4 (4-0-8)**  
**Prerequisites:** ICBI 103 Biology II, ICBI 215 General Biochemistry  
 An individual's psychology and the ways that it can affect adjustment to illness; prevention of illness through health promotion
- ICBI 401 Genetics and Molecular Biology II** **4 (4-0-8)**  
**Prerequisites:** ICBI 211 Genetics and Molecular Biology I  
 A higher course in genetics and molecular biology; genome analysis; organelle genetics; genetic analysis of development; cancer genetics; variation and complex traits; molecular cloning and tools; genomics-proteomics-bioinformatics
- ICBI 402 Epidemiology** **4 (3-2-7)**  
**Prerequisites:** ICBI 101 Biology, ICBI 103 Biology II, ICMA 151 Statistics for Science I, ICMA 252 Biological Statistics Laboratory  
 Prevalence of endemic health problems caused by infectious diseases or non-infectious disorders; diseases of Southeast Asia in comparison with those occur in tropical Africa and America; field studies included
- ICBI 403 Introduction to Tropical Medicine** **4 (4-0-8)**  
**Prerequisites:** ICBI 214 General Microbiology  
 Environmental factors in tropical countries which facilitate endemic diseases; geographical distribution and transmission of commonly found diseases caused by microbes, protozoa, and helminthes with special reference to Southeast Asia; non-infectious diseases existing in the region such as nutritional disorders, food poisoning, snake and other venomous bites and stings; prevention of the tropical diseases
- ICBI 404 Molecular Biology Laboratory** **2 (0-4-2)**  
**Co-requisites:** ICBI 401 Genetics and Molecular Biology II  
 A laboratory course focusing on the process of DNA cloning in bacteria; DNA transformation and purification; restriction endonuclease digest and ligation; PCR and gel electrophoresis
- ICBI 405 Community Health** **4 (3-2-7)**  
**Prerequisites:** ICBI 207 Ethics for Bioscience  
 Survey of community health status; primary health care concept; health system analysis and health manpower development; practical sessions in local hospitals and field trips included
- ICBI 406 Ergonomics** **2 (2-0-4)**  
**Prerequisites:** ICBI 101 Biology, ICBI 103 Biology II  
 Physiological and psychological aspects in the workplace emphasizing the interface of the man, machine and environment as efficient as possible; work station design; work posture; manual materials handling; work-rest cycle, and seating
- ICBI 407 Occupational Health and Safety** **4 (4-0-8)**  
**Prerequisites:** ICBI 207 Ethics for Bioscience, ICMA 252 Biological Statistics Laboratory  
 Environmental factors at work regarding workers' health and safety, such as air, water, food, chemical or biological materials handled in the production line, including waste and waste disposal; evaluation harmful effects of such factors for controlling them; prevention of dissatisfaction and risk assessment in the workplace

- ICBI 411 Psychopathology** 4 (4-0-8)  
**Prerequisites:** ICSS 112 Introduction to Psychology  
An introduction / overview to the definition, assessment, and classification of abnormal behavior as well as historical approaches to the understanding and treatment of abnormal behavior; selected forms of psychopathology; major orientations; clinical assessment; psychotherapies and biological treatments; cross-cultural issues dealing with abnormality
- ICBI 414 Industrial Microbiology** 4 (4-0-8)  
**Prerequisites:** ICBI 214 General Microbiology  
Physiology, nutrition and growth of microorganisms important to various industries; control of microbial growth in industrial production process; application of microorganisms in production of cells, primary and secondary metabolites
- ICBI 415 Biotechnology** 4 (4-0-8)  
**Prerequisites:** ICBI 214 General Microbiology, ICBI 215 General Biochemistry  
Technology and the applications of scientific principles in relation to animals, plants, microorganisms; production of cellular compounds in public health, agriculture and industry
- ICBI 432 Plant Biotechnology** 4 (4-0-8)  
**Prerequisites:** ICBI 231 Plant Biology  
Concepts of plant biotechnology; quality and quantity improvement of plant and their products; technique for micropropagation, germplasm collection, bioactive compound from plants; technology for crop improvement
- ICBI 433 Fermentation Technology** 4 (4-0-8)  
**Prerequisites:** ICBI 214 General Microbiology or ICFS 213 General Microbiology for Food Science and Technology, or equivalent  
Principle of biological fermentation process; submerged fermentation; solid state fermentation; disinfection of the equipment; factors affecting the process; raw material for fermentation; media design, optimization of fermentation condition; process control, downstream processing; quality control of products
- ICBI 434 Food Biotechnology** 4 (4-0-8)  
**Prerequisites:** ICBI 215 General Biochemistry  
Concept of food biotechnology; food components and qualities of food; chemical property of food; biochemical changes in food; condition and factors affecting the process and quality of food; food sanitation and hygiene; food preservation; industrial process for food production; e.g. flour, oil, meat, dairy, cereal products, etc.
- ICBI 435 Molecular Techniques in Biotechnology** 4 (4-0-8)  
**Prerequisites:** ICBI 272 General Biochemistry Laboratory, ICBI 401 Genetics and Molecular Biology II  
Current techniques in DNA manipulations; genomic; transcriptomic and proteomic; molecular techniques in real applications
- ICBI 436 Industrial Enzymology** 4 (3-2-7)  
**Prerequisites:** ICBI 214 General Microbiology, ICBI 215 General Biochemistry  
Industrial applications of enzyme in: alcohol production, analytic enzymes, animal feed, baking, brewing, cheese and whey, chemical biotransformation, detergents, effluent and waste treatment, fruit juices, immobilized enzymes, leather, olive and other edible oils, protein modification, pulp and paper, textiles, and wine; experimental practice imitates the research process to discover a new product of enzyme from bacteria: i.e. isolation and selection, optimization for growth and production, purification, immobilization of the enzyme, enzyme assay
- ICBI 437 Current Issues in Biotechnology** 2 (2-0-4)  
**Prerequisites:** ICBI 214 General Microbiology, ICBI 215 General Biochemistry  
Recent advances in biotechnology research and development; Bioinformatics; local and foreign expert guest speakers

- ICBI 440 Marine Ecology and Conservation** 4 (4-0-8)  
**Prerequisites:** ICBI 262 Practical Field Ecology and Conservation OR At the discretion of the instructor  
**Co-requisites:** ICBI 442 Practical Marine Ecology and Conservation  
 Adaptations; behaviour; diversity; physiology; ecological roles; marine ecosystems; marine resources; trophic interactions; human activities; sustainable management; significance of global climate change; coral reef bleaching; reef rehabilitation & restoration; mangrove deforestation & reforestation; conservation measures
- ICBI 442 Practical Marine Ecology and Conservation** 2 (0-4-2)  
**Prerequisites:** ICBI 262 Practical Field Ecology and Conservation OR At the discretion of the instructor  
 Laboratory and field procedures; analyzing abiotic conditions; surveying biotic communities; assessing productivity; evaluating anthropogenic threats
- ICBI 443 Fungal Ecology** 4 (3-2-7)  
**Prerequisites:** ICBI 231 Plant Biology  
 Ecology of fungi and fungi-like microorganisms (slime molds and water molds); importance in food chains; nutrient recycling; morphology and physiology; nutrition and metabolism; growth and differentiation; reproduction and life cycles; classification; ecological roles; culture collection; advantages of fungi and fungal products
- ICBI 461 Cell Technology** 4 (3-2-7)  
**Prerequisites:** ICBI 216 Cell Biology  
 Structure, growth and function of plant and animal cells; technology involved in cell and tissue culture; cell preservation; protoplast culture and fusion; cell cloning and fusion; monoclonal antibody production; breeding and genetic engineering; applications of stem cells for agriculture and therapeutic purposes
- ICBI 464 Entrepreneurship and Innovation in Science** 4 (4-0-8)  
**Prerequisite:** must complete at least 120 credits before register for this course  
 Develop the entrepreneur mindset through life science and innovation; From academia to entrepreneur, current trends in biomedical industry; how to do a startup project; find opportunities and passion that will drive innovation; consider factors for successful entrepreneurship, including business plans, finding funds, regulatory requirements, market needs; ethics and professionalism; intellectual property and risks
- ICBI 465 Internship in Biological Sciences** 4 (0-12-0)  
**Prerequisite:** Students must complete at least 120 credits and placement will be subjected to the internship policy of the Biological Science Program  
 Internship in the area of biological sciences under supervision
- ICBI 499 Research Project and Seminar in Biological Sciences** 8 (0-16-8)  
**Prerequisites:** must complete 120 credits before register for this course  
 Small research project in biological sciences under supervision of an advisor; proposal and final presentations are also required to complete this course
- ICCD 102 CD Seminar** 4 (4-0-8)  
**Prerequisite:** -  
 Investigating the field of communication design and what it means to be a successful designer in the contemporary professional environment; lectures, visiting designers, topical discussions, and student research
- ICCD 103 Research Studio** 4 (2-4-6)  
**Prerequisite:** -  
 An investigation of a wide variety of research methods facilitating the creative practice; content-based assignments intended to challenge students' conceptual, critical, and communicative skills; encouragement of experimentation, exploration of self-developed concepts, and risk-taking

- ICCD 112 Drawing Studio** 4 (2-4-6)  
**Prerequisite:** -  
An introduction to the visual language of drawing with an emphasis on depicting organic and geometric objects in space; exploring how the parts of the drawing relate to each other and to the composition as a whole; fundamental skills in mark-making using the traditional black-and-white media
- ICCD 119 2D Design Principles** 4 (2-4-6)  
**Prerequisite:** -  
Foundations and principles of pictorial design; a focus on the concepts of the picture plane, figure/ground relationships, scale and proportional transformation, composition, and value; the development of a range of design vocabulary and repertoire of practical techniques; an introduction to formal design strategies
- ICCD 121 Color for Design** 4 (2-4-6)  
**Prerequisite:** -  
A study of the additive and subtractive principles of color theory as they apply to the communication design process; an emphasis placed on color mixing, color relationships, visual impact, as well as the psychological and symbolic uses of color
- ICCD 130 3D Design Principles** 4 (2-4-6)  
**Prerequisite:** -  
A project based class in which students are challenged to apply the principles of design to the creation of the three-dimensional compositions; both simple linear and planar construction materials will be used; an introduction to a variety of tools and techniques; stressing students' achievement in design development, production methods and presentations of the finished works
- ICCD 140 Digital Images and Processes** 4 (2-4-6)  
**Prerequisite:** -  
A focus on digital photography, manipulation of photographic images, and the use of illustration software using a project approach; an emphasis on processes and ancillary operations related to the digital media
- ICCD 150 Art History** 4 (4-0-8)  
**Prerequisite:** -  
An introduction to basic elements of visual literacy through the exploration of art history in a variety of cultural traditions, geographic locations, and the chronological periods; principles of design, form, and iconography; exploring the art of different societies and cultures
- ICCD 201 Conceptual Development** 4 (2-4-6)  
**Prerequisite:** -  
Processes relating to the generation and formulation of ideas; reflective consideration of the various ways these concepts can be presented; communicating effectively with the target audience; producing engaging and informative creative projects
- ICCD 202 Professional Ethics** 4 (4-0-8)  
**Prerequisite:** ICCD 103 Research Studio  
Ethical and legal issues; intellectual property; copyright, legal usage for illustration and photo images; client relationship; ethics for clients, public and social, colleague, and yourself
- ICCD 210 Communication Design Studio** 4 (2-4-6)  
**Prerequisite:** ICCD 119 2D Design Principles  
The communication design principles; communication design terminology; the design layout and concept; type, image and color; technology software for design

- ICCD 219 Typography** **4 (2-4-6)**  
**Prerequisite:** ICCD 119 2D Design Principles  
 The use of typography in communication design projects including design principles, process and practice, organizational skills and the formative aspects of typographic symbols and arrangement
- ICCD 221 Print Production** **4 (2-4-6)**  
**Prerequisite:** ICCD 130 3D Design Principles  
 The current process and practice of the publication design including the printing process (pre and post-production) in various applications and platforms with the understanding of design principles and techniques involved in the making of multiple-pages document
- ICCD 222 Traditional Techniques Studio** **4 (2-4-6)**  
**Prerequisite:** -  
 An exploration of traditional techniques and methods relating to illustration, printmaking, and handmade books; an emphasis on developing skills related to hand-made images and forms while deepening an understanding of how mediums and techniques are related to the expression of content
- ICCD 231 Current Issues in Communication Design** **4 (4-0-8)**  
**Prerequisite:** -  
 Seminar for advanced students focusing on topical exploration of issues, questions or challenges facing Communication Design Professionals. Including topics such as the relationship between contemporary design trends and study/preservation of cultural heritage; opportunities and applications of green design; new technologies; user experience/interface, etc.
- ICCD 239 Online Culture Communication** **4 (2-4-6)**  
**Prerequisite:** ICCD 119 2D Design Principles  
 The digital communication process and practice including the principle of digital media, communication content and structure development, user interface (UI) and user experience (UX); various applications, techniques, and platforms with current technology are also introduced along with design principles
- ICCD 250 Graphic Design History** **4 (4-0-8)**  
**Prerequisite:** -  
 A historical survey of graphic design, presenting the work from various perspectives: cultural and cross-cultural, historical and timeless; a focus on shaping visual sensibilities and broadening the palette of references essential to the process of design thinking
- ICCD 280 Study Trips: Regional** **2 (0-4-2)**  
**Prerequisite:** -  
 A focus on experiential learning for a relatively short duration; a concentration on a particular location in Thailand or in Asia-Pacific in regards to cultural and historical aspects; exposure to designers in the region and to design trends in that locale
- ICCD 281 Study Trips: International** **2 (0-4-2)**  
**Prerequisite:** -  
 A focus on experiential learning; concentration on a particular location abroad in regards to cultural and historical aspects; exposure to designers in other countries and to design trends in that locale
- ICCD 290 Typeface Design** **4 (2-4-6)**  
**Prerequisite:** ICCD 219 Typography  
 Advanced study of typography, the analysis of the perceptual aspects of type, the exploration and clarification of typographic variables in designing typeface including the anatomy, specimen, technique, technology, and publication of typeface



- ICCD 300 Internship** **4 (4-0-8)**  
**Prerequisite:** ICCD 322 Integrated Branding, ICCD 323 Advertising Campaign Development, and ICCD 341 Online Communication Strategic Planning  
 Professional working knowledge and process; practice professional conduct and responsibility in the workplace; time management; organizing work flow; relations with co-worker; future career goal
- ICCD 320 Environmental Graphics** **4 (2-4-6)**  
**Prerequisite:** ICCD 130 3D Design Principles  
 An introduction to professional design techniques, processes, and practices of Environmental Graphics Design (EGD) including the usage of design principles, various applications, technologies, and platforms
- ICCD 321 Infographics** **4 (2-4-6)**  
**Prerequisite:** ICCD 201 Conceptual Development  
 Data visualization; data collection and analyzation; isotype; hierarchy; idea generation; design layouts; type, color and image; technology software for design
- ICCD 322 Integrated Branding** **4 (2-4-6)**  
**Prerequisite:** ICCD 201 Conceptual Development  
 The advanced design systems for the corporate identity design and the identity design manual including all integrated brand materials and communication components; techniques, processes, design principles, and practices
- ICCD 323 Advertising Campaign Development** **4 (2-4-6)**  
**Prerequisite:** ICCD 201 Conceptual Development  
 Advertising strategy; the creative design development; creative copywriting; idea and concept development; advertising mediums; advertising productions
- ICCD 324 Package Design** **4 (2-4-6)**  
**Prerequisite:** ICCD 201 Conceptual Development  
 3-D form; package functioning; packaging patterns; research for marketing; materials usage and development; printing process for packaging; technology software for design
- ICCD 326 Communication Design Practicum** **4 (2-4-6)**  
**Prerequisite:** ICCD 322 Integrated Branding, ICCD 323 Advertising Campaign Development and ICCD 341 Online Communication Strategic Planning  
 Professional Practice; strategy planning and Implementation; advanced creative solutions; client relationship; budget planning; teamwork development and collaborative workflow
- ICCD 341 Online Communication Strategic Planning** **4 (2-4-6)**  
**Prerequisite:** ICCD 239 Online Culture Communication  
 The process and practice of online communication strategic planning including the communication content, structure, and navigation development along with the elements of users' experience with design and digital media principles; current techniques, applications, and platforms in designing basic digital promotional tools
- ICCD 342 New Media Design** **4 (2-4-6)**  
**Prerequisite:** ICCD 239 Online Culture Communication  
 The new media design process and practice with an understanding of design principles and design foundations for the new media with current technologies of various applications, techniques, and platforms for the motion graphic creation and production

- ICCD 400 Thesis Research and Development** 4 (4-0-8)  
**Prerequisite:** -  
An initiation to the process of concept development of the senior thesis project in both the written and visual forms; engagement in various forms of traditional and non-traditional research in order to identify the thesis, and develop the parameters of the visual and written project; peer and the faculty support to engage students in the process of critical inquiry
- ICCD 401 Thesis Writing Seminar** 4 (4-0-8)  
**Prerequisite:** -  
A focus on the production of the written senior thesis and the statement of intent for the senior thesis project; various strategies to lead students from research, through drafting and editing, to finished formal documents
- ICCD 410 Thesis Design** 4 (2-4-6)  
**Prerequisite:** ICCD 400 Thesis Research and Development  
Thesis research and development; clarifying individual interest; professionalizing in communication design; self-directed research project; acceptable design solutions and techniques; individual time management; precise media implementations
- ICCD 411 Thesis Production** 4 (2-4-6)  
**Prerequisite:** ICCD 410 Thesis Design  
The thesis production to solve the design problem: clarifying individual interests; finalizing design solution and techniques; individual time management; precise media implementations; public installation and exhibition; written thesis report
- ICCD 420 Portfolio Development** 4 (4-0-8)  
**Prerequisite:** ICCD 322 Integrated Branding  
Instruction and criticism toward the design of professional prints and digital formats portfolio for reviewing by prospective employers, clients or the graduate school admission committees including presentations and critical skills
- ICCD 421 Exhibition and Planning** 4 (2-4-6)  
**Prerequisite:** -  
All facets of the production of exhibition of the senior thesis project required for graduation from the communication design major; an emphasis on skillfully and professionally presenting a consistent thematic body of work; details of presentation relating to publicity and display are determined and realized
- ICCH 210 General Chemistry I** 4 (4-0-8)  
**Prerequisites:** -  
Concepts of general chemistry; matters, atoms, compounds, reactions, gases, thermodynamics, electrons in atoms, periodic table, chemical bonding; intermolecular forces, and spontaneous changes
- ICCH 211 General Chemistry II** 4 (4-0-8)  
**Prerequisites:** ICCH 210 General Chemistry I  
Comprehensive general concepts and principles of chemistry; solutions, equilibria, acids and bases, solubility, electrochemistry, chemical kinetics, chemistry of main-group and transition elements, coordination compound, nuclear chemistry and selected topics in chemistry
- ICCH 221 Organic Chemistry I** 4 (4-0-8)  
**Prerequisites:** ICCH 211 General Chemistry II  
Concepts and mechanistic considerations of organic chemistry; molecular structures and properties; methane and alkane chemistries; stereochemistry; acyclic compounds; alkyl halides; alkenes; conjugation and resonance; alcohols; ethers and epoxides; alkynes

- ICCH 222 Organic Chemistry II** 4 (4-0-8)  
**Prerequisites:** ICCH 221 Organic Chemistry I  
Concepts of organic reactions through mechanistic approach; aromaticity and electrophilic aromatic substitution; spectroscopy and structure; aldehydes and ketones; carboxylic acids and derivatives; carbanions, amines, phenol and aryl halides; fats; carbohydrates; amino acids
- ICCH 224 Integrated Laboratory Techniques in Chemistry I** 2 (0-4-2)  
**Prerequisites:** ICCH 210 General Chemistry I *or* **Corequisites:** ICCH 210 General Chemistry I  
Laboratory practicals for general chemistry: measurements; stoichiometry; solids, liquids and solutions; gases; thermochemistry; equilibrium; acids and bases; electrochemistry; kinetics
- ICCH 309 Scientific Research and Presentations** 4 (4-0-8)  
**Prerequisites:** ICCH 222 Organic Chemistry II *or* lecturer permission  
Literature search and review, research design and ethics, data collection and analyses, scientific writing, oral and poster presentation; critical scientific review
- ICCH 311 Analytical Chemistry** 4 (3-2-7)  
**Prerequisites:** ICCH 211 General Chemistry II  
Separation techniques and concepts of modern analytical methods essential for quantitative and qualitative characterization; treatment of the analytical data; principles and applications of chemical equilibria; electrochemical methods; separation methods; practical exercises involving the use of spectroscopic analytical equipment
- ICCH 316 Modern Methods of Analysis** 4 (3-2-7)  
**Prerequisites:** ICCH 311 Analytical Chemistry  
Concepts of modern analytical methods for quantitative and qualitative analyses and molecular structure characterization; gas and liquid chromatography, molecular absorption and emission spectroscopy; the atomic absorption and emission spectroscopy; practical exercises involving the use of spectroscopic analytical equipment
- ICCH 321 Organic Spectroscopy** 4 (4-0-8)  
**Prerequisites:** ICCH 222 Organic Chemistry II  
Concepts and applications of spectroscopy used in organic molecular structure determination; mass spectrometry; UV-Visible spectroscopy; Infrared spectroscopy; proton and carbon-13 nuclear magnetic resonance
- ICCH 322 Advanced Organic Chemistry** 4 (4-0-8)  
**Prerequisites:** ICCH 222 Organic Chemistry II *or* lecturer permission  
Advanced concepts of organic chemistry through physical chemistry and mechanistic approaches; stereochemistry; kinetics and equilibria thermodynamics; conformation and reactivity; molecular orbital theory and pericyclic reactions
- ICCH 329 Integrated Laboratory Techniques in Chemistry II** 2 (0-4-2)  
**Prerequisites:** ICCH 224 Integrated Laboratory Techniques in Chemistry I and ICCH 311 Analytical Chemistry *or* lecturer permission  
Laboratory practicals for physical chemistry and related analytical chemistry: thermodynamics laws and enthalpy; kinetics and rate laws; molecular spectroscopy; atomic absorption spectrometry; infrared spectrometry; UV-vis spectrometry; gas chromatography-mass spectrometry; titration; electrochemistry
- ICCH 333 Physical Chemistry I** 4 (4-0-8)  
**Prerequisites:** ICCH 211 General Chemistry II and ICMA 213 Calculus II  
Concepts of classical physical chemistry; behavior of gases; The first, second and third laws of thermodynamics; chemical equilibria; phases and solutions; phase equilibria; the rate of chemical reactions

- ICCH 334 Physical Chemistry II** 4 (4-0-8)  
**Prerequisites:** ICCH 211 General Chemistry II and ICMA 213 Calculus II  
Concepts of classical and non-classical physical chemistry; the quantum theory and spectroscopy; statistical thermodynamics
- ICCH 336 Computational Chemistry** 4 (4-0-8)  
**Prerequisites:** ICCH 211 General Chemistry II *or* lecturer permission  
An introduction to molecular modeling methods to study geometries, properties and reaction of compounds; molecular mechanics, semi-empirical and ab-initio methods and density functional theory
- ICCH 337 Applied Computational Methods and Cheminformatics** 4 (4-0-8)  
**Prerequisites:** ICCH 336 Computational Chemistry *or* ICCH 381 Mathematics for Chemists *or* lecturer permission  
Uses of computer for chemistry-related calculations; installation and uses of computational software for chemistry applications, selection of appropriate software and methodology for chemical system investigation, basic application of programming language(s) to chemistry related problems
- ICCH 371 Biochemistry I** 4 (4-0-8)  
**Prerequisites:** ICBI 101 Biology, ICCH 221 Organic Chemistry I, *or* lecturer permission  
Biomolecules, structure, conformation, and function of proteins and DNA, controls and processes of metabolism at cellular and molecular levels
- ICCH 372 Biochemistry II** 4 (4-0-8)  
**Prerequisites:** ICCH 371 Biochemistry I *or* lecturer permission  
Biosynthesis of macromolecular precursors; storage, transmission and expression of genes; molecular physiological processes
- ICCH 373 Biochemistry Laboratory** 2 (0-4-2)  
**Prerequisites:** ICCH 371 Biochemistry I, ICCH 224 Integrated Laboratory Techniques in Chemistry I *or* co-requisites: ICCH 371 Biochemistry I  
Laboratory practicals in biochemistry: physical and chemical properties of biological molecules; DNA protein extractions; enzyme kinetic and activity analysis; buffers; carbohydrate metabolism mechanism
- ICCH 381 Mathematics for Chemists** 4 (4-0-8)  
**Prerequisites:** ICCH 211 General Chemistry II and ICMA 213 Calculus II  
Mathematics essential for chemists for the study of advanced physical chemistry topics such as quantum mechanics and statistical thermodynamics; partial differential equations; special functions; complex variables; the theory of analytic functions
- ICCH 390 Organic Chemistry Laboratory Techniques** 2 (0-4-2)  
**Prerequisites:** ICCH 222 Organic Chemistry II and ICCH 224 Integrated Laboratory Techniques in Chemistry I *or* lecturer permission  
Supplementary organic laboratory practicals for those interested in developing more and advanced organic laboratory techniques through running more advanced organic reactions; Grignard synthesis; Friedel-Crafts; Diazonium salts; Diels-Alder and the spectroscopic analysis
- ICCH 391 Material Science** 4 (4-0-8)  
**Prerequisites:** ICCH 211 General Chemistry II  
Fundamental concepts of material science and engineering; structure, energetics, and bonding
- ICCH 393 Dermatology** 4 (4-0-8)  
**Prerequisites:** ICCH 371 Biochemistry I *or* lecturer permission  
An introduction to science of human skin; cellular structure and function, clinical conditions

- ICCH 394 Colloid and Emulsion chemistry** 4 (4-0-8)  
**Prerequisites:** ICCH 333 Physical Chemistry I *or* lecturer permission  
A variety of topics in surface science, emulsions, foams, aerosols, surfactants, self-assembly, micelles and vesicles
- ICCH 395 Cosmetic Science** 4 (3-2-7)  
**Prerequisites:** ICCH 222 Organic Chemistry II *or* lecturer permission  
Scientific principles in cosmetic science; the definition of cosmetics, product formulation, vehicles of cosmetic products, functions of active ingredients, laboratory practice and/or field study related to the topics
- ICCH 396 Pharmaceutical Science** 4 (4-0-8)  
**Prerequisites:** ICCH 222 Organic Chemistry II *or* lecturer permission  
Applications of chemical principles to the study and evaluation of pharmaceutical systems; pharmaceutical stability, pharmacokinetics, drug delivery systems, molecular and cellular pharmaceuticals
- ICCH 425 Current Topics in Organic Chemistry I** 4 (4-0-8)  
**Prerequisites:** ICCH 322 Advanced Organic Chemistry *or* lecturer permission  
The frontier in organic chemistry; reaction or synthesis or mechanism topics
- ICCH 426 Current Topics in Organic Chemistry II** 4 (4-0-8)  
**Prerequisites:** ICCH 322 Advanced Organic Chemistry *or* lecturer permission  
The frontier in organic chemistry; bioorganic chemistry, natural products or macromolecules
- ICCH 427 Current Topics in Applied Chemistry I** 4 (4-0-8)  
**Prerequisites:** ICCH 222 Organic Chemistry II *or* lecturer permission.  
The frontier in applied chemistry; industrial chemistry or nuclear chemistry
- ICCH 428 Current Topics in Applied Chemistry II** 4 (4-0-8)  
**Prerequisites:** ICCH 222 Organic Chemistry II *or* lecturer permission  
The frontier in applied chemistry; environment chemistry or medicinal chemistry
- ICCH 429 Current Topics in Physical Chemistry** 4 (4-0-8)  
**Prerequisites:** ICCH 334 Physical Chemistry II *or* lecturer permission  
The frontier in physical, computational and theoretical chemistry topics
- ICCH 430 Current Topics in Inorganic Chemistry** 4 (4-0-8)  
**Prerequisites:** ICCH 442 Inorganic Chemistry II *or* lecturer permission  
The frontier in inorganic chemistry topics
- ICCH 433 Current Topics in Biochemistry** 4 (4-0-8)  
**Prerequisites:** ICCH 372 Biochemistry II *or* lecturer permission  
The frontier in biochemistry or biophysics topics
- ICCH 441 Inorganic Chemistry I** 4 (4-0-8)  
**Prerequisites:** ICCH 222 Organic Chemistry II *or* lecturer permission  
Concepts of inorganic chemistry; structure of the atom; bonding models in inorganic chemistry; covalent bond; structure and reactivity; chemical forces

- ICCH 442 Inorganic Chemistry II** 4 (4-0-8)  
**Prerequisites:** ICCH 441 Inorganic Chemistry I *or* lecturer permission  
Advanced concepts of inorganic chemistry; solid state; acid-base chemistry in inorganic chemistry; physical properties and characterization of coordination compounds; reaction mechanism of coordination compounds; oxidative-reductive ligand substitution reactions
- ICCH 445 Integrated Laboratory Techniques in Chemistry III** 2 (0-4-2)  
**Prerequisites:** ICCH 329 Integrated Laboratory Techniques in Chemistry II *or* lecturer permission  
Laboratory practicals covering inorganic chemistry and related analytical chemistry techniques: inorganic complex formation; inorganic compound synthesis and characterization; organometallic chemistry; inorganic spectroscopy; titration; gravimetric quantification; liquid chromatography, gas chromatography, chromatography techniques
- ICCH 446 Chemical Unknown Detective** 2 (0-4-2)  
**Prerequisites:** ICCH 445 Integrated Laboratory Techniques in Chemistry III *or* lecturer permission  
Selected techniques of substance identification and substance quantification; case studies or field study and laboratory practice
- ICCH 454 Seminar in Chemistry** 2 (2-0-4)  
**Prerequisites:** Seniors *or* lecturer permission  
Current topics of interest in the frontier of chemical research discussed with an emphasis on searching chemical database for research papers for in-class discussion
- ICCH 455 Senior Project in Chemistry** 6 (0-12-6)  
**Prerequisites:** Seniors *or* lecturer permission  
A small research project in chemistry under the supervision of an advisor. The course is designed for the chemistry major to be acquainted with the techniques, management and the implementation of a research project
- ICCM 104 Intermediate English Communication I** 4 (4-0-8)  
**Prerequisites:** Placement test *or* ICME 100  
Rhetorical patterns, basic academic research and writing.
- ICCM 105 Intermediate English Communication II** 4 (4-0-8)  
**Prerequisites:** ICCM 104  
Academic research and writing.
- ICCM 106 Intermediate English Communication III** 4 (4-0-8)  
**Prerequisites:** ICCM 105  
Basic elements of public speaking in an academic context, presentation skills, informative and persuasive speeches.
- ICCM 111 Advanced English Communication I** 4 (4-0-8)  
**Prerequisites:** Placement test  
Academic literacy and presentation skills in reading, writing and public speaking, with an emphasis on rhetorical patterns of development.
- ICCM 112 Advanced English Communication II** 4 (4-0-8)  
**Prerequisites:** ICCM 111  
Academic literacy and presentation skills in reading, writing and public speaking, with an emphasis on secondary research and argumentation.

- ICCM 202 Exploring Global Realities** 4 (4-0-8)  
**Prerequisites:** ICCM 106 *or* ICCM 112  
 Contemporary issues; critical/analytical writing, oral presentations based on class materials and research; assignments; portfolio, debated and term paper.
- ICCM 203 Introduction to Literary Analysis** 4 (4-0-8)  
**Prerequisites:** ICCM 106 *or* ICCM 112  
 Selected literary genres: short story, novel, poetry and drama; assignments: portfolio, debate, and term paper.
- ICCM 204 Creative Writing** 4 (4-0-8)  
**Prerequisites:** ICCM 106 *or* ICCM 112  
 Fiction, poetry, drama and media production; introduction and practice writing in different genres; publication of a small literary magazine for MUIC.
- ICCS 100 Computer Fundamentals and Concepts** 4 (4-0-8)  
**Prerequisites:** -  
 A broad overview of the following topics: computers and their operations; algorithms and problem solving; computer arithmetic and number systems; computer hardware and software components; physical and network access to devices and their data
- ICCS 101 Introduction to Computer Programming** 4 (3-2-7)  
**Prerequisites:** -  
 Roles of algorithms in problem solving; concepts of data types, including integers, floating-point numbers, and strings; statements and expressions; simple input/output; conditionals and control-flow; iteration, including loops and recursion; functions; basic collections, including resizable arrays and dictionaries; classes and mechanics of object-oriented programming
- ICCS 121 System Skills and Low-level Programming** 4 (4-0-8)  
**Prerequisites:** ICCS 100 Computer Fundamentals and Concepts; ICCS 101 Introduction to Computer Programming  
 Linux environment, including toolchain and scripting; version control e.g. Git; law and licenses; low-level programming in C: syntax, semantics, and primitives; data types: array, functions, null-terminated strings, and pointers; preprocessor and build tools; dynamic memory allocation; bit-level representations of data, including two's complement, alignment, and non-integral data representation; machine-level programming, including x86 assembly, memory model, and basic machine architecture
- ICCS 161 Introduction to Data Science** 4 (3-2-7)  
**Prerequisites:** ICMA 151 Statistics for Science I  
 An overview of data science; software stack for data scientists; acquiring data from online sources; data cleansing and simple manipulation; exploratory data analysis and visualization; statistical inference and modeling; basic machine learning algorithms; classification and its applications; clustering and its applications; a brief introduction to natural language processing; data science and ethical issues
- ICCS 204 Data Structures and Object-Oriented Programming** 4 (3-2-7)  
**Prerequisites:** ICCS 101 Introduction to Computer Programming *or* ICPY 221 Computer Programming for Physics  
**Co-requisites:** ICCS 206 Discrete Mathematics  
 Principles of object-oriented design and problem solving; objects and classes; encapsulation, abstraction, and information hiding; inheritance and polymorphism; unit testing; abstract data types and data structures, including stacks, queues, linked lists, hash tables, ordered dictionaries, binary search trees, priority queues, and heaps; upper bound efficiency analysis using big-O; elements of Java programming; the use of an integrated development environment
- ICCS 205 Numerical Computation** 4 (4-0-8)  
**Prerequisites:** ICCS 101 Introduction to Computer Programming; ICMA 213 Calculus II  
 Taylor's theorem; roots of equations; interpolation; numerical integration and derivative; solutions to systems of equations; Monte Carlo simulation; optimization

- ICCS 206 Discrete Mathematics** 4 (4-0-8)  
**Prerequisites:** ICMA 106 Calculus I  
Mathematical statements and logical deduction; proves and proof techniques including direct, contradiction, contrapositive, induction, and invariants; summation, asymptotics, and recurrences; counting: combinations, permutations, and basic counting techniques; discrete probability: finite probability space, events, conditional probability, independence, random variables, expectation, variance, covariance, discrete distributions; graphs: tree, tree traversal, undirected graphs, directed graphs, weighted graphs, Euler's tours, isomorphisms, spanning trees
- ICCS 225 Database Foundations** 4 (4-0-8)  
**Prerequisites:** ICCS 121 System Skills and Low-level Programming; ICCS 204 Data Structures and Object-Oriented Programming  
Database design and ER models; relational models; relational algebra; concepts and syntax of SQL; storage and indexing; transactions; joins; distributed databases and replication; NoSQL; performance optimization
- ICCS 227 Principles of Computer Systems and Architecture** 4 (4-0-8)  
**Prerequisites:** ICCS 121 System Skills and Low-level Programming  
Memory systems and memory management, including caches and virtual memory; exceptional control flows, including exceptions and processes, signals, and non-local jumps; networking and network programming, including socket API and principles behind the networking subsystem; processor architectures and implications to programmers: principles of pipelining and implementation, performance optimization; system-level I/O; concurrent programming, synchronization, and system-level parallel programming
- ICCS 271 Interaction Design** 4 (4-0-8)  
**Prerequisites:** ICCS 204 Data Structures and Object-Oriented Programming  
Requirement analyses, including non-functional and functional requirements; data gathering; software design and prototyping; principles of good design; the software life cycle; software-development methodologies; quality assurance; cost modeling in software projects
- ICCS 302 Human Computer Interaction and Visualization** 4 (4-0-8)  
**Prerequisites:** ICCS 271 Interaction Design  
Design and evaluation of information systems and interfaces; user-centered design methods and skills; developing requirements through personas and scenarios; sketching, rapid prototyping and iterations; evaluation techniques: heuristics, cognitive walkthrough, user testing; usability and accessibility; visual design using principles of human perception and cognition; structured design and evaluation of visualizations; web-based interactive visualizations
- ICCS 303 Competitive Programming** 4 (4-0-8)  
**Prerequisites:** ICCS 204 Data Structures and Object-Oriented Programming  
Introduction to competitive programming; differences from non-competitive programming; getting started with online contests; teamwork and contest strategies; problem solving paradigms including complete search, divide and conquer, greedy and dynamic programming; graph problems; data structure problems; string algorithms; computational geometry algorithms; search heuristics; ad-hoc problems
- ICCS 309 Scientific Research and Presentations** 4 (4-0-8)  
**Prerequisites:** ICCS 161 Introduction to Data Science; Junior standing  
Scientific methods of discovery; developing a hypothesis, testing and interpreting of the results; proper format for presenting papers in public and in a scientific forum; practical sessions and participation in scientific seminars
- ICCS 311 Functional and Parallel Programming** 4 (4-0-8)  
**Prerequisites:** ICCS 204 Data Structures and Object-Oriented Programming  
Functional evaluation and operational semantics; recursive functions, cost analysis, and proofs by induction; datatypes, pattern-matching, and structural recursion/induction; higher-order functions and currying; laziness and streams; cost semantics and parallel cost models such as work and span; theoretical efficiency and basic scheduling; parallelism, including parallel decomposition, tree parallelism, and vector parallelism; shared-memory parallel programming, including OpenMP, fork/join parallelism; standard parallel primitives and algorithms, including prefix scan, map, reduce, and sorting



- ICCS 312 Algorithms and Tractability** 4 (4-0-8)  
**Prerequisites:** ICCS 204 Data Structures and Object-Oriented Programming; ICMA 213 Calculus II  
Asymptotic analysis (big-O, big-Omega, big-Theta, little-o, little-omega); recurrences; algorithmic strategies, including divide and conquer, greedy, inductive design, and dynamic programming; probabilistic analysis and randomized algorithms; graphs and graph algorithms, including traversal, minimum-spanning tree, shortest paths, network flow; amortized analysis; reduction, tractability, and basic complexity classes; NP-completeness, classic NP-complete problems, and techniques for coping with hard problems
- ICCS 315 Applied Algorithms** 4 (4-0-8)  
**Prerequisites:** ICCS 312 Algorithms and Tractability  
Selection of topics from the following: hashing in various contexts, including Bloom filters, load balancing, document similarity, and data streaming; dimensionality reduction and nearest-neighbor searching; locality-sensitive algorithms; string algorithms; coding and error correction; and current research in the relevant areas
- ICCS 320 Computer Networks** 4 (4-0-8)  
**Prerequisites:** ICCS 227 Principles of Computer Systems and Architecture  
Network architecture, layering, and protocols; networked applications; socket programming; reliable data delivery, including flow control; routing and forwarding; local Area Networks; resource Allocation, including congestion control, CDN; mobility; network security
- ICCS 322 Operating Systems Design and Implementation** 4 (4-0-8)  
**Prerequisites:** ICCS 227 Principles of Computer Systems and Architecture  
Roles and importance of operating systems; overall structure of an operating systems; concept of process and process management; threads; synchronization and mechanisms; CPU scheduling; deadlock; virtual memory and memory management; protection and access control; security and threats
- ICCS 323 IoT Electronics** 4 (4-0-8)  
**Prerequisites:** ICCS 121 System Skills and Low-level Programming; ICPY 102 Physics II  
Electronic Components; circuit design and analysis; analog circuit; microcontroller programming; networking and data communication; IoT architecture and middleware; cloud-based computing
- ICCS 340 Web Application Development** 4 (4-0-8)  
**Prerequisites:** ICCS 204 Data Structures and Object-Oriented Programming  
Protocols for web-based application; HTML; DOM; CSS; JavaScript; authentication; authorization; single-page application development; multi-pages application development; client-side validation; server-side validation; MVC and related design patterns; web services; micro services; deployment; security issues
- ICCS 361 Data Mining** 4 (4-0-8)  
**Prerequisites:** ICCS 161 Introduction to Data Science; ICCS 204 Data Structures and Object-Oriented Programming  
Overview of data mining and its applications; software stack for data mining; acquiring data from web-scraping and data APIs; structured, semi-structured, unstructured data; data cleansing and manipulation; dimensionality reduction; exploratory data analysis and visualization; large-scale data platforms including HDFS; machine learning algorithms for large data sets; recommendation systems; natural language processing and its applications
- ICCS 370 Software System Construction** 4 (4-0-8)  
**Prerequisites:** ICCS 204 Data Structures and Object-Oriented Programming  
Modern development tools, including development environments, build tools, test automation, debugger; profiling and performance tuning; software verification; software testing; UML diagrams; design patterns; system architectures; entity design and conceptual modeling; source code refactoring

- ICCS 371 Scalable Systems** 4 (4-0-8)  
**Prerequisites:** ICCS 311 Functional and Parallel Programming; ICCS 370 Software System Construction  
Challenges in constructing scalable distributed systems; system models and architectural patterns; networking and operating system support; RPC and middleware; binding and naming; synchronization; naming and directory services; distributed transaction processing; data replication; scalable databases
- ICCS 372 Software Engineering** 4 (4-0-8)  
**Prerequisites:** ICCS 370 Software System Construction  
Requirements analysis, including non-functional and functional requirements; data gathering; design and prototyping; principles of good design; the software life cycle; software-development methodologies; quality assurance; cost modeling in software projects
- ICCS 380 Cooperative Education Seminar** 2 (2-0-0)  
**Prerequisites:** Completed at least 96 credits  
Concepts, processes, rules and regulations for cooperative education; management of organization; guidelines for applying academic knowledge and professional skills to accomplish tasks in the organization; workplace code of conducts; professional communication skills; office automation, note taking, reporting, presentation, aptitude and attitude in workplace
- ICCS 381 Cooperative Education I** 8 (8-0-288)  
**Prerequisites:** ICCS 380 Cooperative Education Seminar  
Concepts of cooperative education, processes and steps, rules and regulations, fundamental knowledge and techniques in pursuing a career; workplace selection, application letter writing, job interview, knowledge for practical experience in workplace, qualifications, administrative system: health and safety, five keys to a Total Quality Environment, corporate culture, training and workshop on developing personality for working society, techniques of writing reports and making presentations, communication skill development, techniques in building self-confidence, problems or obstructions and approaches in solving problems during the job training
- ICCS 382 Cooperative Education II** 8 (8-0-288)  
**Prerequisites:** ICCS 381 Cooperative Education I  
Continuation of working as an actual employee from previous trimester under guidance of course coordinator and supervisors; writing cooperative education reports and giving presentations
- ICCS 404 Computer Graphics and Augmented Reality** 4 (4-0-8)  
**Prerequisites:** ICCS 204 Data Structures and Object-Oriented Programming; ICMA 223 Linear Algebra A  
Representation and manipulation of graphical data; two-dimensional and three-dimensional transformations; curves; surfaces; projection; illumination and shading models; raster and vector graphic I/O devices; augmented reality technologies; basic object and location tracking; representation of augmented reality content
- ICCS 407 Senior Project I** 6 (0-12-6)  
**Prerequisites:** ICCS 309 Scientific Research and Presentations; Completed at least 96 credits  
Initiation of a research or development project in computer science or related fields under the supervision of an advisor; conducting preliminary research into the problem to identify a proper scope and research questions; delivery of a written report and an oral presentation of the senior project proposal
- ICCS 408 Senior Project II** 6 (0-12-6)  
**Prerequisites:** ICCS 407 Senior Project I  
Completion of the design and measurements of the research/development project proposed in the prerequisite course under supervision of the advisor; delivery of a written report and an oral presentation of the progress in this term

**ICCS 409 Senior Project III****Prerequisites:** ICCS 408 Senior Project II

Conducting an actual investigation/experiment that has been designed in the prerequisite course; analyzing gathered data to address the proposed research thesis; delivery of a written report and an oral presentation of the work in all three senior project courses as a whole

**ICCS 412 Topics in Theory I****4 (4-0-8)****Prerequisites:** ICCS 312 Algorithms and Tractability

Topic(s) from areas of theoretical computer science, including data structures, algorithms, and complexity theory, chosen according to current research and industrial trends

**ICCS 413 Topics in Theory II****4 (4-0-8)****Prerequisites:** ICCS 312 Algorithms and Tractability

Topic(s) from areas of theoretical computer science, including data structures, algorithms, and complexity theory, chosen according to current research and industrial trends

**ICCS 418 Computer System Security****4 (4-0-8)****Prerequisites:** ICCS 227 Principles of Computer Systems and Architecture

Security trends; information security and risk managements; access control, security architecture and design; physical and environmental security; telecommunications and network security; cryptography; business continuity and disaster recovery; legal/regulation compliance and investigations; application security; operation security; practical workshops of basic firewall appliance, DMZ and IPS

**ICCS 423 Topics in Systems I****4 (4-0-8)****Prerequisites:** ICCS 227 Principles of Computer Systems and Architecture

Topic(s) from areas of systems in computer science chosen according to current research and industrial trends

**ICCS 424 Topics in Systems II****4 (4-0-8)****Prerequisites:** ICCS 227 Principles of Computer Systems and Architecture

Topic(s) from areas of systems in computer science chosen according to current research and industrial trends

**ICCS 444 E-Commerce****4 (4-0-8)****Prerequisites:** ICCS 271 Interaction Design; ICCS 370 Software System Construction

History of e-commerce, real and virtual networks, supply-side versus demand-side scale economies, business models, domain names, content management systems, merchant systems, system design and sizing, enterprise integration, payment mechanisms, personalisation and internationalisation, search engine interaction, driving and analysing traffic; dynamic pricing models, logs and audit, collaborative filtering and affinity marketing brand value, funding Internet ventures

**ICCS 448 Mobile Application Programming****4 (4-0-8)****Prerequisites:** ICCS 271 Interaction Design; ICCS 370 Software System Construction

Mobile application platforms; cross-platform framework; native application development; single-view and multi-view application development; database for mobile application, local files and media; connecting to web-services: JSON, XML; working with sensors and GPS; UI design for multiple screen sizes; publishing mobile application

**ICCS 461 Machine Learning****4 (4-0-8)****Prerequisites:** ICCS 161 Introduction to Data Science; ICCS 205 Numerical Computation

Probability and maximum likelihood estimate; k-nearest neighbor methods; decision tree and basic information theory; regressions; ensemble learning algorithms including bagging, boosting and random forest; support vector machines; perceptron and neural networks; deep learning; unsupervised learning; semi-supervised learning; PAC learning and VC dimension

<b>ICCS 463 Topics in Machine Learning I</b> <b>Prerequisites:</b> ICCS 161 Introduction to Data Science; ICCS 205 Numerical Computation Topic(s) from areas of Machine Learning chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCS 464 Topics in Machine Learning II</b> <b>Prerequisites:</b> ICCS 161 Introduction to Data Science; ICCS 205 Numerical Computation Topic(s) from areas of Machine Learning chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCS 471 Topics in Software Technology I</b> <b>Prerequisites:</b> ICCS 271 Interaction Design Topic(s) from areas of Software Technology chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCS 472 Topics in Software Technology II</b> <b>Prerequisites:</b> ICCS 271 Interaction Design Topic(s) from areas of Software Technology chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCS 491 Topics in Computer Science I</b> <b>Prerequisites:</b> - Topic(s) from areas of computer science chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCS 492 Topics in Computer Science II</b> <b>Prerequisites:</b> - Topic(s) from areas of computer science chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCS 493 Topics in Computer Science III</b> <b>Prerequisites:</b> - Topic(s) from areas of computer science chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCS 494 Topics in Computer Science IV</b> <b>Prerequisites:</b> - Topic(s) from areas of computer science chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCS 495 Topics in Computer Science V</b> <b>Prerequisites:</b> - Topic(s) from areas of computer science chosen according to current research and industrial trends	4 (4-0-8)
<b>ICCU 201 Society, Politics and Economics in Contemporary Asia</b> <b>Prerequisites:</b> - Introduction to Southeast Asia (SEA) and its extraordinary diversity through the humanities, the arts and social sciences. Emphasis on the intellectual and practical challenges linked to modernization and development. Study of the ways SEA-member states cope with the social, cultural, economic, political and religious issues brought about by globalization.	4 (4-0-8)
<b>ICCU 202 Introduction to Eastern and Western Art</b> <b>Prerequisites:</b> - Introduction to the reading of a work of art as well as to learning and using specialized vocabulary to articulate the aesthetic experience. Appreciation of the personal, social, political, and cultural meanings and significance of the visual arts. Understanding of the universality of the human experience expressed in a variety of art mediums as well as examination of the reasons for creating art. Introduction to an educated analysis and interpretations of artworks from a variety of cultural and artistic traditions.	4 (4-0-8)

- ICCU 203 Introduction to Value Studies** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to value theory from a philosophical, sociological and economic perspective. Focus on the interplay between value and culture. Exposure to a wide array of theoretical approaches to the problematic relationship between the descriptive and the normative. Considered as an introduction to Ethics, Philosophy and Economics Concentration.
- ICCU 204 History of Ideas I** 4 (4-0-8)  
**Prerequisites:** -  
An introduction and examination of the basic ideas that have shaped individuals and societies. Broadly conceived, this two-part course will be organized around four central themes: ethics, knowledge, power and society, and culture and difference. These themes will not only be treated independently but considered as intersecting, historically and cross-culturally. Readings will be drawn from a wide range of sources both East and West.
- ICCU 205 History of Ideas II** 4 (4-0-8)  
**Prerequisites:** ICCU 204 History of Ideas I  
An introduction and examination of the basic ideas that have shaped individuals and societies. Broadly conceived, this two-part course will be organized around four central themes: ethics, knowledge, power and society, and culture and difference. These themes will not only be treated independently but considered as intersecting, historically and cross-culturally. Readings will be drawn from a wide range of sources both East and West.
- ICCU 206 Ethics and Media** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to the ethical issues and decisions editors face in covering and providing the news to the public. Examination of regulated and unregulated news from four different sources, including government, corporate, and privately owned, and public media outlets, as well as the various formats including print, broadcast, and digital (Internet and social media).
- ICCU 301 Introduction to Women and Gender** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to women and gender studies and a combination of women's studies, men's studies and LGBT (Lesbian, Gay, Bisexual and Transgender) studies. By the end of the course students understand the history of women, production of gendered bodies, identities, the invention of sexuality and race in modernity, cultural productions and representation. Exploration of the social constructions of gender and sexuality and of the historical and culturally specific ways of producing gender.
- ICCU 302 Literature and Poetry in Western Culture** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to the origins and genres of European/Western literature in order to trace the growth of ideas about the nature of mankind's ethical and political life from ancient Greek texts through medieval epics and shifts imposed by scientific ideas and progress to the birth of the novel. Understanding the process of re-conceptualizing ancient concepts throughout Western literature as vital for the creation of cultural heritage of the modern world and as tools for change as well.
- ICCU 303 Literature and Poetry in Eastern Culture** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to selected representative texts and genres of Eastern literature that shaped the civilization of Asia. Starting with the earliest written record in Indian, Chinese and Japanese literature to their metamorphosis in modern times, readings range from philosophical texts to literature of the court, poetry, drama and epics with attention to their historical and cultural backdrops. Contemporary East Asian Literature will be briefly explored to show how traditional values persist, change or become points of resistance in a complicated globalized world.

**ICCU 304 The Origin of Language and Culture****4 (4-0-8)****Prerequisites: -**

Examination of the evolution of language and culture from the early hominids to modern man. Review of scientific research to show that both language and culture are evolutionary adaptations which were and are central to the success of the evolution of our species.

**ICCU 305 Judgment and Decision Making****4 (4-0-8)****Prerequisites: -**

The course discusses decision-making theories and the characteristic of human judgments in normative, psychological and sociological terms. It particularly highlights the problematic interplay between business practices and ethical thought with regard to the notion of rationality.

**ICCU 311 Recurrent Topics in German Literature****4 (4-0-8)****Prerequisites: -**

The general aim of this course is to provide an introduction to important literary works in Germany and Switzerland between the 50s and the 90s of the last century. The selected novels are written by the well-known Swiss and German authors M. Frisch, H. Boell and B. Schlink. Due to the high profile of the chosen novels, they were widely discussed in German speaking societies, they were also adapted as movies. Besides the selected novels, secondary texts about contemporary issues will be read, class discussions and written assignments added. A selection of key film scenes will be also screened.

**ICCU 312 Recurrent Topics in French Literature****4 (4-0-8)****Prerequisites: -**

An introduction to the rich, varied and multicultural panorama of the French and the French - speaking world literature through selected topics and texts. The focus of the course may vary from a diverse thematic analysis with historical and social context to a study of a wide range of literary genres. Study of some of the famous classic texts as well as political, philosophical and devotional texts. Exploration of literary expression of love, human's place in the natural world, childhood, youth and women in French literature.

**ICCU 313 Contemporary Chinese Literature****4 (4-0-8)****Prerequisites: -**

Introduction to the 20th century formative period in China through literary texts. Exploration of diverse topics such as national crisis, political justice, freedom of expression, individual freedom in order to understand the modern society of China. The literature selected ranges from satire to novels, amorous poems to "peasant literature". Literary analysis and aesthetical discussions form the center of the course. Short non-fictional texts will supplement the understanding of the philosophical, political and artistic movement.

**ICCU 314 Contemporary Japanese Literature****4 (4-0-8)****Prerequisites: -**

This course introduces brief history of Japanese literature and Japanese cultural background in order to understand and appreciate contemporary Japanese literature. It explores a wide range of Japanese literary works after World War II and discusses the manner in which writers responded to the challenges of industrialization, internationalization and post war trauma. The impact of Westernization on the construction of gender, nation and identity will be discussed.

**ICCU 315 Literature in Spain****4 (4-0-8)****Prerequisites: -**

Introduction to the historical background of the history and culture of Spain in order to understand the literary works. Exploration of imperialism and Civil War and its influence on the literary works of art. An overview of the main literary movements and authors in Spain, focusing on the Golden Age and the generation of 98 and 27. Analysis and interpretation of different texts from each genre (poetry, theatre and narrative) to understand its characteristics and its connection with the sociocultural context.

**ICCU 316 Spanish American Literature****4 (4-0-8)****Prerequisites: -**

An introduction to the historical background of the Spanish speaking world in order to understand their literary works. Exploration of diverse perspectives of the colonialism and its influence on the literary success of the Spanish American Literature, especially regarding the novel. An overview of the main literary movements and authors in Spanish American Literature from the beginning of the XX century up to the present.

**ICCU 317 Comparative Literature and Civilization****4 (4-0-8)****Prerequisites: -**

Introduction to seminal texts and writings that represent cultural and intellectual thought that has informed who we are and our respective orientations to the world. The course will look at excerpts from writers and thinkers such as Valmiki, Shakespeare, Machiavelli, Swift, Dostoevsky, Kawabata and Rushdie.

**ICCU 320 Introduction to Literary Criticism****4 (4-0-8)****Prerequisites: -**

The course is a survey of developments in literary theory from the twentieth century to the present, from Formalism and New Criticism through to Post-colonial and Feminist Criticism and Gender Studies. Students will gain knowledge of a number of theoretical perspectives from which they will be able to evaluate and comment on literary works from a number of genres and cultural contexts. This course provides valuable insights, background and skills for other courses within the Critical Studies of English (CSEL) concentration of the Intercultural Studies Major Program.

**ICCU 321 Diasporic Literature****4 (4-0-8)****Prerequisites: -**

Introduction to various diasporic texts dealing with migration and displacement. Exploration of the nuances of the terms 'Immigrant', 'Exile' and 'Refugee' and also the differences and similarities between diaspora and related concepts such as race, nation and cultural identity. Learning about the complexities of adaptation or resistance to new cultures, the different stages of adjusting and adapting to the culture of a host country; culture transfer; hybridity and biculturalism.

**ICCU 322 Literature Topics in Religion, Culture and Gender****4 (4-0-8)****Prerequisites: -**

Examination of the dynamic relationship between gender and religion as social constructions and/or biological facts of life. Exploration of psychological notions of gender from a biological, psychoanalytical, behavioural, cognitive and cultural psychological perspective. Close examinations of ethnographic case studies to demonstrate how relatedness, relationships and identities are differently constructed and imagined, particularly in the context of the world religions: Hinduism, Christianity, Buddhism, Islam and Judaism. Socio-cultural examination of sex and gender in view of comparative religious studies to open a window upon understandings of both masculinities and femininities - offering important insights into a wealth of socio-economic structure.

**ICCU 323 Language, Power, Culture****4 (4-0-8)****Prerequisites: -**

Exploration of some contributions made to the understanding of language by social sciences, in particular: Anthropology, Sociology and Cultural Psychology. Providing insights on a range of themes related to language (and in particular to English). Exploration of the cultural dimensions of language and its role in 'socially constructing' lived reality, i.e. written vs. spoken word; inherent power-discourses in language (with focus on English in the past, present and future); and the connection between language and national identity.

**ICCU 325 Popular Culture****4 (4-0-8)****Prerequisites: -**

Introduction to a variety of analytical and critical strategies for reading, viewing, and understanding trends in popular mainstream culture. Students will hone their critical thinking skills by using popular culture texts in books, TV, film, and new media. Looking at a variety of popular texts and analyzing what current trends and anxieties these texts represent and market to consumers.

**ICCU 326 Research Writing Skills****4 (4-0-8)****Prerequisites: -**

An introduction to the basics of research methodology and the format of research papers is followed by a student-centric approach to developing appropriate research writing skills; Use of sample papers will provide students with models in which to prepare an effective abstract and research paper outline/short academic article.

**ICCU 327 Creative Non-Fiction Writing****4 (4-0-8)****Prerequisites: -**

Introduction to creative nonfiction, a flourishing genre of writing a step away from academic work. Students will read nonfiction work that is compelling, informative, and insightful but also entertaining, imaginative, and risky. Students will be asked to write their own creative nonfiction works based on experiences or observations of a subject of interest. This course will add another dimension to students writing abilities and apply creative techniques to their academic and professional writing work.

**ICCU 328 Language in Society****4 (4-0-8)****Prerequisites: -**

This course introduces students to the field of sociolinguistics and, for students in the Intercultural Studies and Language program, provides useful insights into the interface between language and culture. The course addresses the following topics: multilingualism and language choice; language maintenance and shift; linguistic varieties; sociolinguistic ethnography; style, context and register; taboo language; speech functions, politeness and cross cultural communication; language, sex and gender; language, cognition and culture. These topics all provide students with an understanding of how language is used in current social contexts, particularly against the backdrop of globalization.

**ICCU 330 Minds and Machines****4 (4-0-8)****Prerequisites: -**

An overview of central issues in the philosophy of mind and their application to technological innovation and ethics. Issues to be discussed include: What is thought? Is the mind immaterial, is it equivalent to the brain or neither? Does an account of thought also explain consciousness, emotion and/or self-knowledge? Is there reason to suppose that machines could not eventually think, feel, emote, reflect or behave morally? What can artificial intelligence tell us about who and what we are? Readings will be derived from both historical and contemporary sources.

**ICCU 331 Applied Ethics I: Business Ethics – more than CSR?****4 (4-0-8)****Prerequisites: -**

This course teaches fundamental theories of ethics, ethical foundations in business, various ethical concepts and dilemmas in the business world. This course will use real-life cases of the corporate world for analysis and learning, theoretical case studies for the essential process of self-evaluation, and practical methods to test and apply the theories in their own working life. Thereby, it will be demonstrated that an applied holistic concept of business ethics goes beyond CSR, and that business ethics and business success accomplish each other in a sustainable way.

**ICCU 332 Applied Ethics II: Development and Environment****4 (4-0-8)****Prerequisites: -**

Introduction to the ethics of development with regard to both environment and society. Emphasis on the intersection between the central notions of justice, nature and technology, particularly under consideration of sustainability. Critical analysis of current states of affairs in terms of diverse political traditions, the history of colonialism and the dialectic between globalization and segregation. Examples and cases studies include issues of public health, education, food technology, global institutionalization, energy management, the international monetary system, trade, labor migration, and violations of human rights.



**ICCU 333 Intercultural Philosophy****4 (4-0-8)****Prerequisites: -**

There remains an overwhelming number of thinkers who consider the western paradigm of philosophy to be the only genuine paradigm. In this course, we will consider attempts to challenge this view. Drawing on the work of Karl Jaspers and a number of contemporary thinkers (including Raul Fonet-Betancourt, Heinz Kimerle, Ram Adhar Mall, Franz Martin Wimmer, Gregor Paul), we will consider ways in which a more intercultural philosophical approach to social, ethical, epistemological and religious questions can be developed. The Western tradition will be compared, contrasted and integrated with traditions from Asia, Latin America, Islam and Africa.

**ICCU 334 Buddhism and the Public Sphere****4 (4-0-8)****Prerequisites: -**

An introduction into Theravada Buddhism in its historical context and in its modern day-to-day implementation, together with its resulting implications in nowadays societies with differing cultural backgrounds. Exploration of diverse perspectives of modern Buddhist movements and its interacting influence on eastern and western societies. An overview of Buddhist how concepts and practical applications can contribute to conflict resolutions with nowadays problems within the public spheres of economy, politics, ecology, and the business world. Analysis and interpretation of different Buddhist approaches towards the public sphere, and understanding to apply alternatives through Buddhist concepts within a sociocultural context.

**ICCU 335 From Modernism to Postmodernism****4 (4-0-8)****Prerequisites: -**

An introduction to the philosophical and cultural movement of modernism and postmodernism. Tracing the roots of modernism to European Enlightenment and discussing the earliest criticism to the 'age of reason'. Understanding attempts by contemporary critics who reconceptualized a number of concepts such as subjectivity, progress, empiricism and the rule of law. It will be discussed how their efforts lead to a major shift in the way discourse, ideas and cultural developments are treated in the 20th century.

**ICCU 336 Foundation of Behavioral Economics****4 (4-0-8)****Prerequisites: -**

This course surveys research, which incorporates psychological evidence into economics. Within economics, the standard model of behavior is that of a perfectly rational, self-interested utility maximizer with unlimited cognitive resources. In classical economic theory, this provides a good approximation to the types of behavior that economists are interested in. However, over the past 30 years, experimental and behavioral economists have documented ways in which the standard model is not just wrong, but is wrong in ways that are important for economic outcomes. Understanding these behaviors, and their implications, is one of the goals of behavioral economic enquiry. Hence, the aim of this course is provide a foundation in the main areas of study within behavioral economics, including temptation and self-control, fairness and reciprocity, reference dependence, bounded rationality and happiness. For each area of study, we will begin with the standard model of rational decision making, and discuss what behavior this model can and cannot capture. We will then discuss the experimental evidence that indicates that the standard model is missing something important, and the models that have sprung up to account for these violations. Finally, we will look at the implications of these new models for our understanding of how the economy operates.

**ICCU 350 Independent Project in Humanities and Languages****4 (4-0-8)****Prerequisites: -**

Having completed a number of courses pertaining to a particular subject area, students will be given the opportunity to develop independently and apply the knowledge they have thus assimilated. Under the guidance of a faculty member, students will extend their knowledge in that particular subject area. They will locate relevant texts and materials, critically evaluate them, and use them to construct a researched academic major paper and/or compile a portfolio of original works (such as critical essays). All submitted work will aim to be of a publishable standard within the relevant academic discourse. The course, as well as providing a "capstone" to their previous studies, is intended to assist students to make the transition to graduate studies.

- ICEG 232 Advanced Oral Communication** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
Persuasion, non-verbal techniques and voice control for advanced presenters. Activities include study of film clips. Debate strategies, stage and sales presentation will also be examined.
- ICEG 250 Introduction to Linguistics** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
Characteristics and components of human language, focusing on the power and complexity of language, its influence on interactions and its contributions to understanding; definitions and applications of syntax, semantics, pragmatics and other related topics.
- ICEG 265 Literature into Film** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
This course explores the interplay between film and literature. Selected short stories, novels and plays are analyzed in relation to film versions of the same works in order to gain an understanding of the possibilities and problems in the transposition to film. The course will require extensive reading, independent research, writing numerous response essays as well as a formal oral presentation.
- ICEG 342 Diverse English Speaking Cultures** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
Images of Europeans and non-Europeans abound in the writings of each other. Language and Culture: Postcolonialism introduces students to the study and appreciation of this literature. It begins by providing students with a basic introduction to the postcolonial approach, before using it to examine how the "Orient" and the "West" have been represented in a variety of literary texts. Examples are drawn from short stories, novels, travel writing, music and film. The overall aim is to help students develop the ability to understand images/representations in new ways. Evaluation activities include mock trials, debates, plays, presentations, reading notes and essays.
- ICEG 344 Language and Culture** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
Examination of the interplay between language and culture; the Sapir/Whorf hypothesis, culture and vocabulary, culture and interaction styles, culture and discourse styles, contrastive semantics, and contrastive rhetoric, including non-verbal and paralanguage.
- ICEG 355 The Story of English** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
The Story of English examines the development of English from its Indo-European origins to its contemporary varieties and dialects. English will be shown to have changed and grown in structure and vocabulary, depending on time and place. The Public Broadcasting Service production and selections from other media will be shown.
- ICEG 461 Topics in Comparative Literature A: Poetry** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
Poetry, including: metrics, forms, themes, eras, ethnic voices, bilingual verse throughout history.
- ICEG 462 Topics in Comparative Literature B: The Short Story and the Novel** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
This course is a study of the elements of fiction as exemplified in the short story and the novel. The first half of the term is devoted to discussions of short stories, each of which was chosen for its strength in a certain element: characters, dialogue, language use, plot, atmosphere, and point of view. The discussions also analyze how these various elements work in harmony – or discord – to create theme. In the second half of the term, the same analytical process is applied to a novel in chapter-by-chapter class discussions. To prepare the class for these discussions, the instructor will assign each student an aspect of the socio-historical background of the story of the novel to research on and present to the class. Then each student chooses a second novel which he/she responds to in the form of a reading journal. He/she presents the novel to the class near the end of the term. Learning is evaluated through critical response essays, journal writing, presentations, and class participation.

- ICEG 463 Topics in Comparative Literature C: Drama** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
This course explores the ways to understand and appreciate drama both by reading, watching, and analyzing theatrical performances and by staging a theatrical production. This course will require extensive reading, independent research, writing critical essays, theater workshops, and a stage production. The choice between a one-act play (or flash drama) and a reader's theater will be decided upon as a class.
- ICEG 484 First and Second Language Development** 4 (4-0-8)  
**Prerequisites:** ICCM 106 or ICCM 112  
This course develops students' understanding of how children develop their first language within the first few years of life and then compares and contrasts this development to that of a second language, often later in life. Students investigate various theories of language development, from behaviorism to nativism, to more recent cognitive and functional approaches, and explore the implications of these theories.
- ICEN 211 Fundamentals and Applications of Environmental Microbiology** 4 (3-2-7)  
**Prerequisites:** -  
Principles, concepts and techniques of environmental microbiology including; morphology, physiology, metabolism and growth of organisms in Kingdoms of Monera, Protista and Fungi; methods and factors influencing in microbial control in the environment; types, isolation and determination of microorganisms in the environment including water, air and soil; the roles and relation of microorganisms with the environment; the roles of microorganisms related to biodegradation of environmental contaminated substances
- ICEN 212 Ecological Systems Analysis** 4 (4-0-8)  
**Prerequisites:** -  
Mechanisms and interactions in ecosystems; some important ecosystem theories such as control theory, information theory, thermodynamics, and hierarchy theory, the overview of different scientific philosophies for the better understanding of ecosystem theory
- ICEN 241 Environmental Pollution I** 4(4-0-8)  
**Prerequisites:** ICCH 210 General Chemistry I  
Problems concerning environmental pollution, especially physical, chemical, and biological properties of water and soil; sources and effects of pollutants; technological alternatives for the control, prevention, reduction, and treatment of water and soil pollutions; methods for monitoring and management of environmental pollution
- ICEN 301 Basic Environmental Statistics** 4 (4-0-8)  
**Prerequisites:** ICMA 151 Statistics for Science I  
Basic probability and statistics, elementary sampling and monitoring, statistical inferences for means and proportions, detecting and estimating trends, regression and non-parametric statistics, related to the environmental application
- ICEN Environmental Toxicology** 4(4-0-8)  
**Prerequisites:** ICEN 241 Environmental Pollution I  
Principles of environmental toxicology; concepts underlying absorption, distribution, metabolism and excretion of toxic agents in living organisms; nature, sources and fate of contaminants in the environment; potential for harmful exposure, especially to the environment; and applied aspects, including ecological test methods, regulation and similar consideration
- ICEN 313 Waste Minimization and Clean Technology** 4 (4-0-8)  
**Prerequisites:** ICEN 241 Environmental Pollution I  
A reduction or elimination of waste production; a reduction in pollution at source, the changes in procedure, technology and material input; the economic production process; significance and application of waste minimization or clean technology; practical exercises

- ICEN 314 Tropical Ecology** 4 (3-2-7)  
**Prerequisites:** -  
The tropical environment; tropical rainforests and biodiversity; tropical streams, rivers, floodplains and estuaries; tropical lakes; wetlands; mangroves; sea grasses; coral reefs; biogeography; practical exercises and field trips
- ICEN 317 Aquatic Ecology** 4 (4-0-8)  
**Prerequisites:** -  
Hydrological cycle; physico-chemical properties of water; light in the aquatic environment; physical limnology; biological activity in lakes; nutrient limitation; trophic interaction in lakes; characteristics of and material flow in streams and rivers; tides and estuaries; practical exercises
- ICEN 318 Aquatic Ecology Field Course** 4 (0-8-4)  
**Prerequisites:** ICEN 317 Aquatic Ecology  
A field course providing experience in ecological assessments and surveys of aquatic habitats; parameters measured/ascertained include water quality, riparian land use, in-stream and in-take habitat types, algal communities, benthic invertebrates, fish communities; student presentations of their results
- ICEN 319 Conservation Biology** 4 (4-0-8)  
**Prerequisites:** -  
The aims and origins of conservation biology, conservation problems and issues, causes of habitat degradation and extinction, conservation genetics, small population biology, the values of communities and ecosystems, the reduction and management of endangered species, social and ethical issues in conservation
- ICEN 320 Population and Community Ecology** 4 (3-2-7)  
**Prerequisites:** ICEN 351 Population and the Environment  
Introduction to population growth and dynamics of age-structured populations, population control, theory of competition, herbivory, predations, community, trophic structure and control, community diversity, theories of evolution and maintenance of diversity; field trips, sampling and modeling exercises and experiments
- ICEN 331 Soil, Land Use and Degradation** 4 (4-0-8)  
**Prerequisites:** -  
A basic introduction to soil science; its relationship with land resource management and the environment; soil problems and their solutions
- ICEN 332 Introduction to Oceanography** 4 (3-2-7)  
**Prerequisites:** -  
History of oceanography; an introduction to the earth and geomorphology; an evolution of the ocean; plate tectonics; the sea floor; nature of seawater; atmosphere-ocean interactions; circulation patterns and ocean currents; waves and tides; coasts and estuaries; human impact on oceanic system; field trips with practical exercises
- ICEN 341 Environmental Quality Analysis I** 4 (2-4-6)  
**Prerequisites:** ICEN 241 Environmental Pollution I  
Basic knowledge; the importance and the analysis of representative samples; an analysis of environmental quality monitoring using physical, chemical and biological parameters etc.; handling and storage of sample from water, soil, plant and animal; analytical methods and data interpretation
- ICEN 342 Environmental Pollution II** 4 (4-0-8)  
**Prerequisites:** ICEN 241 Environmental Pollution I  
Air, noise, solid waste, hazardous waste, and also radioactive pollution; types, sources, and effects of air and noise pollution; methods for prevention, control and measures of air and noise pollution; source, type, effect, and management of solid waste and hazardous waste; utilization and management of radioactive waste

- ICEN 343 Environmental Quality Analysis II** 4 (2-4-6)  
**Prerequisites:** ICEN 241 and ICEN 341  
Practices on environmental quality monitoring concerning soil, solid waste, air and noise analysis, as well as toxicity testing; data sampling; sample preservation and sampling analysis; a data evaluation
- ICEN 351 Population and the Environment** 4 (4-0-8)  
**Prerequisites:** -  
An introduction to demography; population growth; fertility, mortality and migration; social and economic factors; population and its impact on the environmental system
- ICEN 352 Environmental and Resource Economics** 4 (4-0-8)  
**Prerequisites:** -  
Basic economic theories including market failure, externality and common right problems before taking on economic theories and analyses of environment and natural resources; market instruments and their applications; environment and resource valuation techniques, cost-benefit analysis, problem on National Income Account concerning environment and natural resources and any contemporary related issues
- ICEN 361 Principles of Environmental Impact Assessment** 4 (4-0-8)  
**Prerequisites:** ICEN 241 Environmental Pollution I and ICEN 342 Environmental Pollution II  
Environmental changes and its impact on communities; an environmental impact analysis, statement techniques, assessment methodology, tools such as EIA (Environmental Impact Assessment) for environmental planning and decision making
- ICEN 362 Natural Resource Conservation and Management** 4 (4-0-8)  
**Prerequisites:** -  
The principles of environmentalism and the history of the conservation movement; natural resource and environment, intra-and inter-relationship of ecosystem, causes of natural resource and environment destruction, management direction of natural resource and environment
- ICEN 391 Sustainable Development** 4 (4-0-8)  
**Prerequisites:** -  
What is sustainable development: guiding principles and approaches; 1972 Stockholm Earth Summit; 1992 Rio Earth Summit; Agenda 21; 2002 Johannesburg World Summit; outcomes of the summits; the role of UN agencies, NGOs, governments, businesses and individuals; industry and farming and the environment; population; poverty and inequality; food and agriculture
- ICEN 392 Environmental Issues: Past, Present and Future** 4 (4-0-8)  
**Prerequisites:** -  
An in-depth study of environmental issues e.g. Exxon Valdez and other oil spills; Bhopal and other chemical leaks; Chernobyl and other radiation leaks; ozone depletion; global warning; loss of biodiversity; deforestation; genetic engineering and GMOs; water issues; urban issues; contemporary and likely future environmental issues
- ICEN 393 Practical Training in Environment** 2 (0-4-2)  
**Prerequisites:** -  
Practical training in the real situations related to environmental science and technology in the projects and/or activities of either public or private organization; industries, environmental policy organizations and environmental laboratory units
- ICEN 401 Applied Mathematics for Environment Studies** 4 (4-0-8)  
**Prerequisites:** -  
The use of quantitative methods for decision in environmental problems; mathematical reasoning and analytical tools in resource management and environmental planning; operation research, simulation and environmental monitoring techniques

- ICEN 402 Geoinformatics** 4 (3-2-7)  
**Prerequisites:** -  
The figure and rotation of the earth, great circles, latitude-longitude and time; an introduction to marginal information, map symbol, scale ratio, direction, elevation and relief, position, measurement, and map projection; an interpretation of the serial photograph with the naked eye, pocket and mirror stereoscope; related technology: Imagery, Geographic Information System (GIS) and Global Positioning System (GPS); practical exercises included
- ICEN 403 Principle of Environmental Informatics** 4 (4-0-8)  
**Prerequisites:** -  
An introduction to principles of information technology implementation in environmental study and management; the information technology applications for environmental data manipulation and management; the basic principles of the integrated information technology for sustainable environmental management
- ICEN 411 Climate Change and Its Impact** 4 (4-0-8)  
**Prerequisites:** -  
Climate and weather pattern, greenhouse gases, causes and effect of greenhouse gases on climate, natural catastrophe, which are related to human behavior and vice versa; human activity and changes in natural ecosystems
- ICEN 413 Environmental Remediation Technology** 4 (4-0-8)  
**Prerequisites:** ICEN 241 Environmental Pollution I  
Basic environmental remediation technology; types of contaminants; transport of contaminants; transformation of contaminants; characterization of contaminated sites; methods for remediation: physical, chemical, and biological methods; factors effected on remediation technologies; criteria to select appropriate environmental remediation technology; sites selection; basic experimental design
- ICEN 414 Waste Utilization** 4 (4-0-8)  
**Prerequisites:** ICEN 241 Environmental Pollution I  
Features, compositions and sources of agricultural; technologies for agricultural waste management; separation and product recovery technology; enzyme technology; pulp production; bioplastic and valuable compounds production; renewable energy; biogas, biodiesel, compost production; effective microorganism (EM) utilization
- ICEN 415 Biodiversity** 4 (4-0-8)  
**Prerequisites:** -  
Biological resources; genetic and species including ecological diversities; the importance of biodiversity; measurements of biodiversity; factors affecting biodiversity and its impacts: production and consumption patterns, commercial agriculture, population growth, destruction of natural habitat, pollution, global environmental changes impacts from GMOs; sustainable use of biodiversity; biodiversity conservation; relating international convention and law; policy and plans including security issues concerning biodiversity in Thailand
- ICEN 416 Ecotoxicology** 4 (4-0-8)  
**Prerequisites:** ICEN 312 Environmental Pollution I  
Toxicants mediate interactions between organisms and their biotic and abiotic environments; biochemical and physiological mechanisms of toxicity; defenses against toxicants; population, community, ecosystems and evolutionary ecotoxicology; quantifying and measuring ecotoxicological effects; case studies
- ICEN 421 Water and Wastewater Treatment** 4 (4-0-8)  
**Prerequisites:** ICEN 241 Environmental Pollution I  
Principle of water treatment technology; aeration process, pH adjustment, coagulation and flocculation, sedimentation and filtration, ion exchange and adsorption, membrane process and disinfection; the basic of water supply; raw water source, characteristics, water quality inspection and water supply technology; source of supply, distribution system, quantity of water supply and design of water supply capacity; wastewater characteristics, wastewater forecasting, wastewater collecting system, wastewater treatment system, basic design of wastewater treatment plant, wastewater reuse

- ICEN 422 Solid and Hazardous Wastes Management** **4 (4-0-8)**  
**Prerequisites:** ICEN 241 Environmental Pollution I  
 Principles of solid and hazardous waste management; sources, types and composition of municipal solid waste, hazardous waste, infection waste, and radioactive waste; solid waste generation and prediction of solid waste quantity; storage, collection and transportation, waste transformation, physical chemical and biological treatment processes, recycling, remediation
- ICEN 431 Land Use and Urban Environmental Planning** **4 (4-0-8)**  
**Prerequisites:** ICEN 331 Soil, Land Use and Degradation  
 Basic concept, components and processes, land uses and classification; land use controlling factors; land use planning and process, suitability analysis; land use and natural resources; the economics and regulation of land use; land use management and control
- ICEN 432 Global Geomorphology** **4 (4-0-8)**  
**Prerequisites:** -  
 The form of land surface and the process which creates it; the study of submarine features planetary exploration and landscapes of the major solid bodies of the solar system; relationship between landforms and the processes currently acting on them
- ICEN 441 Occupational Health and Safety** **4 (4-0-8)**  
**Prerequisites:** -  
 Appropriate design of various environmental sanitation facilities; health assessment and safety measures and works for the industrial factory workers, officers etc; controlling work-related risks; workable strategy in managing occupational health and safety; practical exercises included
- ICEN 460 Ecotourism** **4 (2-4-6)**  
**Prerequisites:** -  
 Ecological principles applied to tourism; principles of human behavior used in eco-tourism issues; the relationship between natural resources and tourism; planning and management of natural, cultural resources and people's way of life for sustainable use in tourism with special focus on rural areas, wildlife sanctuaries and other areas of forests, mountains, beaches and islands
- ICEN 461 Energy Conservation and Development** **4 (4-0-8)**  
**Prerequisites:** -  
 World and local energy situation; energy policies and strategies; the relationship between energy, the environment and the economy; renewable resources and social energy requirements; conservation, substitution and technology options; integrated energy management systems
- ICEN 462 Coastal and Marine Resources** **4 (4-0-8)**  
**Prerequisites:** -  
 Coastal areas or coastal zones; coastal utilization, impacts on coastal ecosystems, regulations and laws as well as the principles for coastal conservation and managements
- ICEN 464 Water Resources Management** **4 (4-0-8)**  
**Prerequisites:** -  
 The processes in the hydrologic cycle including measurement, computation, estimation and determination in each area; water resources problems, the conception, planning and design of functional elements and facilities to control and utilize water, basic to all water management
- ICEN 465 Resource Inventory and Baseline Studies Methods** **4 (3-2-7)**  
**Prerequisites:** ICEN 331 Soil, Land Use and Degradation  
 Appropriate techniques and methodologies for resource inventory, including the survey on geology, soils, hydrology, aquatic and terrestrial ecosystems, such as wetlands, plants, wildlife, etc; integrated approaches and methods; practical exercises



- ICEN 466 Environmental Management Systems** **4 (4-0-8)**  
**Prerequisites:** ICEN 241 Environmental Pollution I  
 Principles of environmental management system (EMS) of ISO14001; development and setting of environmental policy, environmental management system planning; EMS implementation and operating, EMS checking and correction; management review, including management audit
- ICEN 467 Environmental Risk Assessment and Management** **4 (4-0-8)**  
**Prerequisites:** ICEN 312 Environmental Toxicology  
 Concept of risk assessment, human health risk assessment and ecological risk assessment, major risk, risk sources, primary control mechanism, transport and secondary control mechanism, target, exposure assessment, risk decision making and risk management, risk communication, environmental risk inventory system
- ICEN 468 Environmental Management Policy** **4 (4-0-8)**  
**Prerequisites:** -  
 Environmental management, public policy and government decision making on environmental issues; the management of environmental research and education; introduction to environmental law, the legal aspects of environmental protection in theory and practice; the role of environmental movements
- ICEN 469 Heritage Conservation** **4 (2-4-6)**  
**Prerequisites:** -  
 An introduction of heritage; cultural, natural, and cross cutting heritages; global and regional extent and distribution of world heritages; asian heritage sites; heritage functions and values; heritage threats; heritage loss and degradation; wise use of heritages; heritage restoration; law and regulation; world heritage conservation, UNESCO world heritage mission; conservation and management issues
- ICEN 483 Physical Planning and Environment** **4 (4-0-8)**  
**Prerequisites:** -  
 Theory of physical planning in community and regional levels, human settlement and community development process, land use and infrastructure planning based on physical factors, potential of natural resources and appropriate data from scientific method analysis, and planning between urban and rural area in terms of ecology, environmental planning in urban and rural area based on their potentials and development plan, integrated survey and planning
- ICEN 484 Climate Change Mitigation and Adaptation to Changing Disasters** **4 (4-0-8)**  
**Prerequisites:** -  
 Principles of climate change; historical, present and anticipated greenhouse gas emission trends; good practices for greenhouse gas emission reduction measures; calculation of greenhouse gas emissions from each sector; principles of adaptation to anthropogenic-driven disasters; principles of downscaling for climate change impact study
- ICEN 491 Seminar in Environmental Science** **2 (2-0-4)**  
**Prerequisites:** -  
 Student presentations and discussions of research or topics of current interest in environment such as conflict resolution, trade and environment, sustainable development, environmental ethics, public communication, decentralization to the local area, etc.
- ICEN 492 Environmental Field Excursions** **2 (0-4-2)**  
**Prerequisites:** -  
 An on-site study emphasis on pollution prevention technology and pollution reduction in various types of industry and industrial estate, including resource management in both regional and local areas; public participation on the environmental and resource management; case studies



- ICEN 496 Senior Project in Environmental Science** 6 (0-12-6)  
**Prerequisites:** -  
An independent study on a research project in environmentally related filed under the supervision of an advisor; planning and conducting a good research work; data analyzing and interpretation; scientific writing and presentation
- ICFS 111 Introduction to Food Science and Technology** 4 (3-2-7)  
**Prerequisites:** -  
The concept of food science and technology, relationship between the science of food and the well-being of humans; chemistry underlying properties and reactions of various food components; applying of basic principles of microbiology to food processing and safety; basic principles of large scale food production and its quality control
- ICFS 171 Discovering Culinary Arts Techniques** 4 (2-4-6)  
**Prerequisites:** -  
Principles of mise en place (preparation before cooking), proper culinary terminology; developing standardized recipes, basic cooking method both with dry heat and moist heat; developing knife skill, the proper use of ingredients
- ICFS 172 World Cuisines** 4 (2-4-6)  
**Prerequisites:** ICFS 171 Discovering Culinary Arts Techniques  
Global history of food, gastronomy and culture, menus and meals preparation of classical, Western, Eastern, Mediterranean, and Oriental cuisines; identifying culinary trends, principles of menu layout, food presentation techniques; proper cost control and appropriate technology
- ICFS 214 Elements of Physical Chemistry and Biochemistry for Food Science and Technology** 4 (4-0-8)  
**Prerequisites:** ICCH 210 General Chemistry I  
The principles of physicochemical and biochemical aspects of foods, topics including thermodynamics, thermal and mass transfer, physicochemical properties, the structure and function of biomolecules with emphasis on water, carbohydrates, proteins, nucleic acids, lipids and enzymes, metabolism and bioenergetics
- ICFS 215 Human Nutrition** 4 (4-0-8)  
**Prerequisites:** ICFS 214 Elements of Physical Chemistry and Biochemistry for Food Science and Technology  
Elements of human nutrition including vitamins, minerals, micronutrients, and antioxidants including sources, metabolism, and functions in the human body; nutritive values of foods; requirements for human health, nutraceuticals, and functional foods and their effects on human health beyond basic nutrition
- ICFS 231 General Microbiology** 4 (3-2-7)  
**Prerequisites:** ICBI 101 Biology  
Basic knowledge related to structure, physiology and ecology of microorganisms such as viruses, bacteria, and fungi, aspects of microbiology importance in food science and technology; practical exercises
- ICFS 314 Food Analysis** 4 (3-2-7)  
**Prerequisites:** ICCH 224 Integrated Laboratory Techniques in Chemistry I, ICCH 311 Analytical Chemistry  
Principles of chemical and instrumental methods for the qualitative and quantitative analysis of food components and additives, chemical and instrumentals methods, practical exercises in laboratory
- ICFS 317 Food Chemistry** 4 (3-2-7)  
**Prerequisites:** ICFS 111 Introduction to Food Science and Technology, ICCH 211 General Chemistry II, ICCH 221 Organic Chemistry I  
Chemical and physical properties of water, proteins, lipids, carbohydrates, vitamins and minerals; their interactions and functional roles in foods; practical exercises included

- ICFS 318 Food Ingredients Functionality** 2 (2-0-4)  
**Prerequisites:** ICFS 317 Food Chemistry  
Chemistry and functionality of food ingredients in the food product; utilization and challenges of food ingredients in food industries; case studies from scientific literature and food industry
- ICFS 319 The Chemistry of Food and Quality** 2 (2-0-4)  
**Prerequisites:** ICFS 317 Food Chemistry  
Chemistry of plant based raw materials; chemical composition of food products; chemical reactions and changes taking place during the processing and storage; parameters influencing food quality
- IFFS 323 Foods for Sports and Exercises** 4 (4-0-8)  
**Prerequisites:** Being 2nd year student or higher  
Energy sources and energy expenditure of human locomotions; food sources and roles of carbohydrates, protein, dietary fats, micronutrients, fluid, electrolytes, and dietary supplement in sports and exercises, basic nutrition guidelines for high-intensity sports, endurance sports, weight and body-focused sports
- ICFS 333 Food Microbiology** 4 (4-0-8)  
**Prerequisites:** ICFS 231 General Microbiology  
Sources of microorganisms; factors affecting the growth of microorganisms in food; important pathogenic microorganisms in food; Spoilage microorganisms; control and inactivation of pathogenic and spoilage microorganisms in foods; effect of food processing on microorganisms and control; beneficial microorganisms in food; Food fermentation and preservation
- ICFS 334 Food Microbiology Laboratory** 2 (0-4-2)  
**Prerequisites:** -  
**Co-requisites:** ICFS 333 Food Microbiology  
Basic microbiological techniques and standard plate counts; microscopic examination of yeast, mold, and bacteria; the enumeration of microorganisms in foods; most probable number method; the detection and identification of important foodborne pathogens and spoilage microorganisms in foods; Inactivation of pathogens in foods; Food fermentation and beneficial microorganisms; sanitary practices; microbial standards and regulation
- ICFS 341 Food Processing** 4 (3-2-7)  
**Prerequisites:** ICFS 111 Introduction to Food Science and Technology and ICFS 214 Elements of Physical Chemistry and Biochemistry for Food Science and Technology  
Fundamental of the food processing industry; thermal processing, and preservation of food materials by blanching, pasteurization, sterilization, evaporation, dehydration; processing factors that influence quality
- ICFS 342 Food Storage and Shelf Life Extension** 4 (3-2-7)  
**Prerequisites:** ICFS 111 Introduction to Food Science and Technology and ICFS 214 Elements of Physical Chemistry and Biochemistry for Food Science and Technology  
Fundamentals of food preservation; raw material preparations; non-thermal methods, refrigeration, freezing, chemical preservation, including various packaging materials

- ICFS 343 Integrated Approach to Smart and Green Agro-Industry** 4 (4-0-8)  
**Prerequisites:** ICFS 341 Food Processing  
Concepts of smart agriculture for high quality raw materials, environmental-friendly manufacturing technologies, fundamental of plant design, clean technology, sources and uses of water, agro-industry waste management; biological treatment methods
- ICFS 351 Food Engineering Principles** 3 (3-0-6)  
**Prerequisites:** ICMA 213 Calculus II  
Principles of the various unit operations used in the food processing and manufacturing industry; topics covered including units, dimensions, fluid properties, fluid flow, rheology, energy loss in flow, velocity and pressure measurement and unit operations such as pump, mixing, and mechanical separation as applied to food processing and manufacturing operations
- ICFS 352 Unit Operations in Food Engineering** 3 (3-0-6)  
**Prerequisites:** ICFS 351 Food Engineering Principles  
Unit Operations in Food Engineering, major unit operations used in the food processing and manufacturing industry such as dryer, heat exchanger, evaporation, gas absorption; the effects of the input and operational parameters on performance and food quality; thermal processing, mass transfer and heat transfer, psychometrics
- ICFS 361 Principles of Quality Assurance in Food Processing** 4 (4-0-8)  
**Prerequisites:** ICFS 341 Food Processing, ICMA 252 Biological Statistics Laboratory  
Methods of quality control and management in food processing; total quality control management, HACCP, ISO 9000 and 14,000 series, Halal; control of raw materials, process, and finished products; sampling, evaluation of sensory properties, and other factors; a statistical analysis for quality control
- ICFS 362 Food Safety and Sanitation** 4 (4-0-8)  
**Prerequisites:** ICFS 231 General Microbiology  
Principles of food safety and food plant sanitation; hazards and sources, Good Manufacturing Practices (GMPs), Sanitation Standard Operating Procedures (SSOPs), Hazard Analysis Critical Control Point (HACCP); hygienic design of equipment and facilities, cleaning and sanitization, pest control, personal hygiene, hygienic food handling
- ICFS 363 Food Law and Standard of Commercial Food Product** 4 (4-0-8)  
**Prerequisites:** ICFS 317 Food Chemistry  
Food Law and standard of foods and food products in the Thailand; international food regulation; labeling of food product; the regulation of irradiated Foods, biotechnology and genetic modified foods, dietary supplements, functional foods and nutraceuticals
- ICFS 373 Food Safety for Food Service Industry** 2 (2-0-4)  
**Prerequisites:** ICFS 333 Food Microbiology  
Foodborne illnesses and causes of illness; microorganisms causing foodborne illness; contamination and food allergens; safe food handling and personal hygiene; cross-contamination and temperature control; purchasing considerations and storage of foods; preparation and cooking; safe holding temperature and service; cleaning and sanitizing; food safety management systems and safe operation; an integrated pest management; food safety regulation and standards; staff food safety training
- ICFS 374 Experimental design in Food Product Development** 2 (1-2-3)  
**Prerequisites:** ICCS 161 Introduction to Data Science  
An integration of chef and food scientist's tasks through the design of experiments foundation, regression and correlation, basic understanding of multivariate data-analysis techniques, screening designs, the response surface model, the optimization experimental designs
- ICFS 375 Integrated Sensory and Consumer Sciences for Product Development** 4 (3-2-7)  
**Prerequisites:** ICFS 374 Experimental Design in Food Product Development, ICFS432 Sensory Evaluation of Food Products  
Physical stimulants and human sensory perception, understanding of consumer behavior and preference, identifying consumer insights for concept and product improvement; the relationships between instrumental data of food properties - sensory perception - and the data on consumer preference, formulation optimization

- ICFS 376 Science of Thai Culinary Arts** 4 (3-2-7)  
**Prerequisites:** Being 2nd year student or higher  
Chemical, physical, and microbiological aspects of Thai foods, design and analysis for sensory evaluation, flavors and flavors pairing, nutraceutical potentials of Thai cuisines; laboratory session on techniques of Thai cuisine processing for dishes such as stir-fried, steamed, spicy salads, chili paste, curry, fermented food, and deserts; scientific explanation behind local wisdoms of these techniques
- ICFS 411 Food Product Development** 4 (4-0-8)  
**Prerequisites:** ICFS 318 Food Ingredients Functionality  
Principles and steps used in a new product-developing process: formulation, lab-scale production, quality control, and commercial feasibility study; sensory evaluation of food products; the data and statistical analysis of sensory test results; practical exercises
- ICFS 413 Marketing of Food Product and Services**  
**Prerequisites:** ICFS 341 Food Processing  
Principles of marketing with an emphasis on food product; market research and analysis, consumer behavior and marketing strategies; basic economics principles, marketing analytical tools, trends in processed food and food service industries
- ICFS 414 Operations Management in Food Business** 2 (2-0-4)  
**Prerequisites:** ICFS 341 Food Processing  
The main factors affecting the performance in food industry, matching of supply and demand, eliminating inefficiencies, increasing productivity and utility, cost control including the return of investment (ROI) and cost of goods sold (COGS) calculation
- ICFS 418 Fruits and Vegetables Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 317 Food Chemistry, ICFS 341 Food Processing  
Characteristics, composition, and the nutritional importance of fruit and vegetables; characteristics, composition and nutritional importance of fruit and vegetables; post-harvest handling and changes and in product quality; preservation and processing technologies applied to fruits and vegetables; the production of fresh and manufactured food products and ingredients from fruits and vegetables; by-products utilization and waste management of fruit and vegetables processing
- ICFS 419 Meat, Poultry and Marine Product Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 317 Food Chemistry, ICFS 341 Food Processing  
Ready-to-eat meat products, meat fermentation, the control of meat quality, meat structure manipulation, meat processing technologies (high pressure, pulsed electric field, irradiation, ultrasound), meat by-products, meat packaging, meat sensory attributes
- ICFS 422 Dairy Product Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 317 Food Chemistry, ICFS 341 Food Processing  
The composition and properties of milk, physical and chemical changes occurring in milk during processing and storage, milk processing i.e. fluid milk; fermented products, concentrated and dried dairy products, butter, cream frozen dairy desserts; milk microbiology and microbial transformations of milk, food safety aspects, functional health benefits
- ICFS 423 Beverage Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 317 Food Chemistry, ICFS 341 Food Processing  
Ingredients, processing, and packaging technologies for beverages, high-pressure processing, carbonation, alcoholic beverages, fruit juices and soft drinks, extended shelf-life beverages, dilutable beverages, ready-to-drink products, novel concepts of functional drinks and bioactive compounds, market trends
- ICFS 424 Fat and Oil Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 318 Food Ingredients Functionality, ICFS 341 Food Processing  
Processing and technologies of edible fats and oils; physical and chemical properties of both raw materials and finished products such as salad dressing, margarines, butters; quality, safety, and nutritional aspects of fat and oil products

- ICFS 426 Bakery Product Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 318 Food Ingredients Functionality, ICFS 341 Food Processing  
Properties and chemistry of flour, ingredients technology and selection, science of mixing and baking; functional bakery products, sensory attributes of bakery products, packaging and shelf-life extension of finished products; skill development in bread, cake and pastry making
- ICFS 427 Confectionary and Chocolate Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 318 Food Ingredients Functionality, ICFS 341 Food Processing  
The candy processing technology, crystalline and non-crystalline candy, sugar and corn syrup chemistry; aerated confection, chocolate properties, chocolate processing, tempering, panning and shell molding; regulations such as sugar taxes, food safety and quality aspects
- ICFS 432 Sensory Evaluation of Food Products** 4 (3-2-7)  
**Prerequisites:** ICFS 318 Food Ingredients Functionality  
Sensory evaluation theory and practices through descriptive analysis; analytical instrumental methods of sensory evaluation and correlation with consumer sensory evaluation; anatomy and physiology of the sensory systems (sight, taste, smell, touch, and hearing); physiological and psychological factors that affect performance on sensory tests
- ICFS 436 Food Fermentation Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 333 Food Microbiology  
The principle of biological fermentation process; submerged fermentation; solid state fermentation; disinfection of the equipment; factors affecting the process; raw material for fermentation; media design, optimization of fermentation condition; process control, downstream processing; quality control of products
- ICFS 437 Application of Modern biotechnology to Food Products** 4 (3-2-7)  
**Prerequisites:** ICFS 231 General Microbiology  
Potential benefits and risk of biotechnology in foods; GMOs, GM foods and food security; current use, research and development of foods produced through modern biotechnology
- ICFS 438 Cereal and Starch Technology** 4 (3-2-7)  
**Prerequisites:** ICFS 317 Food Chemistry  
Fundamental structure, chemistry, functional properties of cereal and starches; cereal and starch based human food products; their utilization in applications of healthy and functional foods
- ICFS 451 Internship in Food Science and Technology** 4 (0-12-4)  
**Prerequisites:** ICFS 341 Food Processing  
Industrial work-internship program in the food manufacturing industry, the industrial internship program focusing on the actual work and on-the-job training at production line, process control, quality control of process and product, laboratory work; chemical, physical, microbiological analysis
- ICFS 452 Food Packaging** 4 (3-2-7)  
**Prerequisites:** ICFS 342 Food Storage and Shelf life Extension  
Materials, systems, and applications of food packaging materials and methods; properties, fabrication, and function of metal, glass, paper and plastic packaging, sanitation of packaging materials, forming, filling, joining and enclosure operations and related equipment for packaging systems and equipment; selected topics for food packaging applications including aseptic packaging, food-package interactions, sealing integrity, handling of packages, and modified atmospheric packaging
- ICFS 453 Internship in Culinary Science** 4 (0-12-4)  
**Prerequisites:** ICFS 172 World Cuisine, ICFS 373 Food Safety for Food Service Industry  
Food service operation internship program focussing on culinary arts skills

- ICFS 461 Cooperative Education Preparation** 2 (2-0-4)  
**Prerequisites:** ICFS 318 Food Ingredients Functionality, ICFS 341 Food Processing  
 Goal setting for work integrated education in agreement with the private company, the design of the experiment and/or road map of the 16-week industrial daily work experience, discussions of all requirements including safety rules, ergonomic workplace, specific skills needs for the project, and work ethics
- ICFS 462 Cooperative Education** 8 (0-24-0)  
**Prerequisites:** ICFS 461 Cooperative Education Preparation  
 Work-based experience for 16 weeks with specific goals needed to achieve, with the academic supervision and assessment from both faculty and industry supervisors
- ICFS 463 Field Trip** 2 (0-6-2)  
**Prerequisites:** -  
 Visits and industrial plant studies of food manufacturing industry or related organizations
- ICFS 471 Trends and Novel Techniques of World Foods and Cuisines** 4 (3-2-7)  
**Prerequisites:** ICFS 318 Food Ingredients Functionality  
 Current issues, emerging tools and technology in food science, food processing and food service industry; the prediction of trends of world foods; guest lecturers from academic, industry, and culinary arts with some hands-on sessions
- ICFS 489 Culinary Product Development Project** 2 (0-4-2)  
**Prerequisites:** ICFS 318 Food Ingredients Functionality, ICFS 374 Experimental Design in Food Product Development  
 Ideation techniques, prototype development, cost controls, recipe development and conversion to formula ratios
- ICFS 491 Seminar in Food Science and Technology** 2 (2-0-4)  
**Prerequisites:** Seniors  
 Senior student presentations, discussion of research, and reviews of topics of current interest; staff and invited speakers from Mahidol University and from other universities or the food processing industry
- ICFS 495 Senior Project in Food Science and Technology I** 2 (0-4-2)  
**Prerequisites:** Seniors  
 Study and research in food science and technology at the Bachelor's degree level, experimental design, preliminary experiments, research proposal writing
- ICFS 496 Senior Project in Food Science and Technology II** 4 (0-8-4)  
**Prerequisites:** ICFS 495 Special Project in Food Science and Technology I  
 Small research projects in food science and technology or related fields under the supervision of a research advisor
- ICGC 101 Academic Writing and Research I** 4 (4-0-8)  
**Prerequisites:** Placement Writing Test *or* ICME 100 English Resource Skills  
 An introduction to the academic writing process through the development of the writer's voice through sentencings, structure, and rhetorical devices; a focus on strategies for using and integrating researched sources; methods to compose well-structured essays based on themes relevant to the world today
- ICGC 102 Academic Writing and Research II** 4 (4-0-8)  
**Prerequisites:** ICGC 101 Academic Writing and Research I  
 The integration of skills in academic research and writing to analyze and create persuasive compositions; techniques to identify strengths and weaknesses in argument; the development of students' knowledge and preconceptions of global issues through a progressive series of essays and journal assignments

- ICGC 103 Public Speaking** 4 (4-0-8)  
**Prerequisites:** ICGC 102 Academic Writing and Research II  
 Fundamentals of key skills for confident and effective public speaking through a series of prepared and unprepared speeches; an introduction and application of techniques to inform/persuade audiences; the utilization of Academic Writing and Research I and II to create and deliver speeches to a professional standard
- ICGC 111 Academic Writing and Research I (Advanced)** 4 (4-0-8)  
**Prerequisites:** Placement Writing Test  
 Theories and practical methods to enhance students' creative and descriptive abilities; an emphasis on the development of a writer's voice through sentencng, structure, and rhetorical devices; strategies for using and integrating researched sources introduced by means of explaining theories, concepts, and writing conventions
- ICGC 112 Academic Writing and Research II (Advanced)** 4 (4-0-8)  
**Prerequisites:** ICGC 111 Academic Writing and Research I (Advanced)  
 A focus on high levels of academic literacy and presentation skills in reading, writing, and public speaking for experts or near-expert users of English; the utilization of advanced strategies to exploit secondary research and argumentation; an application of advanced skills in critical thinking and rhetorical knowledge through class discussions and written and oral assignments
- ICGC 201 Global Realities** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An exploration and a critical analysis of key texts on poetry, literature, and legislative documents in order to understand the complexity and challenges of the world we live in; themes encouraging students to consider values, human rights and government; class discussions, journal writing, and presentation activities to demonstrate how students can contribute to the betterment of society
- ICGC 202 Literary Analysis** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 A review of literary works from selected literary genres; an exploration of how literature informs our perceptions of the world by way of analytical and critical thinking; an analysis of short stories, poetry and drama; scaffolding of strategies for students to understand the function of a variety of literary forms
- ICGC 203 Creative Writing** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An examination of fictions, poetry, drama, and the media production through readings, speeches and films; comparisons of writing in different genres; a creation of the work of publishable quality by means of the consideration of audience and genre
- ICGC 204 Advanced Oral Communication** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 Theories of persuasion, non-verbal techniques, and voice control for advanced presenters; strategies to develop high levels of voice control and expressions; activities including debates, stage, and sales strategies; the development of students' abilities to express themselves confidently in a variety of academic and professional environments through impromptu and prepared speeches
- ICGC 205 Linguistics** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An introduction to major features and components of the human languages; a focus on power and complexity of languages, its influence on interactions and its contributions to understanding; an exploration of definitions and applications of syntax, semantics, pragmatics, and other related topics
- ICGC 206 Literature Into Film** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An introduction to the technical aspects of translating literature into films; an exploration of the interplay between literature and films through an analysis of short stories, novels, and plays and their film versions; an exploration of the challenges merging both mediums



- ICGC 207 Diverse English Speaking Cultures** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An introduction to the study and appreciation of post-colonial literature; utilizing literature, music, and film to help students develop the ability to understand influences in new ways; an evaluation through a combination of mock trials, debates, plays, presentations, reading notes, and essays
- ICGC 208 Language and Culture** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An examination of the interplay between language and culture; having texts and class discussions to focus on the importance of understanding the link between culture and languages; a completion of research paper on the topic
- ICGC 209 The Story of English** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 The development of English traced from its origins; the/a demonstration through texts, films, and media of the growth and spread of English; an introduction to methods of understanding a variety of linguistic progressions in the language
- ICGC 210 First and Second Language Acquisition** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An introduction to how children develop their first language; comparing and contrasting of the second language development; theories of language development from behaviorism to more recent cognitive and functional approaches; the implications of theories
- ICGC 211 Topics in Comparative Literature A: Poetry** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An in-depth study of poetry, including: metrics, forms, themes, ethnic voices, throughout history; an evaluation of poetry from different genres through a series of discussions, workshops and a term research paper
- ICGC 212 Topics in Comparative Literature B: The Short Story and the Novel** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 A study of elements of fictions in short stories and novels through class workshops on characters, dialogue, plot and atmosphere; class discussions to analyze the effect of historical and social developments on selected themes
- ICGC 213 Topics in Comparative Literature C: Drama** 4 (4-0-8)  
**Prerequisites:** ICGC 103 Public Speaking *or* ICGC 112 Academic Writing and Research II (Advanced)  
 An exploration of ways to understand and appreciate drama by reading, watching, and analyzing theatrical performances; staging and enactment of a theatrical production; readings, essays, and theater workshop activities to prepare students for a final stage performance
- ICGL 101 Elementary German I** 4 (4-0-8)  
**Prerequisites:** Placement test  
 Greetings, introducing oneself or others; German alphabets and phonemes; personal information, numbers from 1 – 100 and price quotations; expressing wishes, telling the time and making appointments; the quality of items, measurements; verb forms, pronouns, sentence structure, gender of nouns, accusative case and plural forms, negation
- ICGL 102 Elementary German II** 4 (4-0-8)  
**Prerequisites:** Placement test *or* ICGL 101 Elementary German I  
 Ordering and paying for meals in a restaurant; preferences of food and drinks; giving and asking for directions; reading a map; preferences of work conditions; job advertisements; essay writing; yes/no questions, imperative forms, compound verbs, preposition with dative case, modal verbs I, German sentence bracket



- ICGL 103 Elementary German III** 4 (4-0-8)  
**Prerequisites:** Placement test *or* ICGL 102 Elementary German II  
Health advice and problems, healthy and unhealthy lifestyles, events, and accidents, travel reports, curriculum vitae (CV); possessive articles in nominative, accusative and dative case, perfect tense, connectors, modal verbs II
- ICGL 111 Elementary Japanese I** 4 (4-0-8)  
**Prerequisites:** Placement test  
The Hiragana and Katakana characters; fundamentals of the basic Japanese grammar (noun-ending sentences, particles, demonstratives, verb-ending sentences, non-past and past tenses); scaffolding of basic vocabulary; basic communication about personal topics (self and others); the description of Japan; the design of written products in the target language; expressing existence, preferences, and agreement; comparing cultures
- ICGL 112 Elementary Japanese II** 4 (4-0-8)  
**Prerequisites:** Placement test *or* ICGL 111 Elementary Japanese I  
The Kanji characters (approximately 50); fundamentals of the basic Japanese grammar concepts (particles, verbs of giving and receiving, na-adjective-ending sentences, i-adjectives-ending sentences, non-past and past tenses, and classifiers); scaffolding of basic vocabulary; basic communication about daily life topics; the design of written products in the target language; expressing simple points of view, describing people and daily life activities; comparing cultures
- ICGL 113 Elementary Japanese III** 4 (4-0-8)  
**Prerequisites:** Placement test *or* ICGL 112 Elementary Japanese II  
The Kanji characters (approximately 50); fundamentals of the basic Japanese grammar concepts (verb conjugation (masu-form, te-form, nai-form, and dictionary form), and related sentence patterns; the polite style of speech, and the plain style of speech, particles); scaffolding of basic vocabulary; basic communication about various topics; the design of written products in the target language; expressing points of view, describing people and various activities; comparing cultures
- ICGL 121 Elementary French I** 4 (4-0-8)  
**Prerequisites:** Placement test  
Fundamentals of the basic French grammar (pronouns, present tense conjugation, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; basic communication about personal topics (self and others); an identification and a description of French speaking countries; the design of written products in the target language; expressing existence, preferences and agreement; comparing cultures
- ICGL 122 Elementary French II** 4 (4-0-8)  
**Prerequisites:** Placement test *or* ICGL 121 Elementary French I  
Fundamentals of the simple French grammar (present and future tense, adjective gender, place and agreement, more complex prepositions, more complex questions); scaffolding of simple vocabulary; simple communication about daily life topics (in France and in their country); the design of written products in the target language; expressing simply point of view, describing people and daily life activities; comparing cultures
- ICGL 123 Elementary French III** 4 (4-0-8)  
**Prerequisites:** Placement test *or* ICGL 122 Elementary French II  
Fundamentals of the more complex French grammar (present and future tense, adjective gender, place and agreement, more complex prepositions, questions and past tense notions); scaffolding of more complex vocabulary; longer communication about daily life topics (in France and in their country); the design of written products in the target language; expressing point of view, describing people and daily life activities; comparing cultures

- ICGL 131 Elementary Chinese I** **4 (4-0-8)**  
**Prerequisites:** Placement test  
 The Chinese phonetic system (Pinyin), the Chinese basic writing system (Stroke order), the Chinese characters (approximately 100) and fundamentals of the basic Chinese grammar (interrogative pronouns, particle 的“de”, Yes/No questions with 吗“ma”, demonstrative pronouns, classifiers, adverb “ye”也, “dou” 都); scaffolding of basic vocabulary; basic communication about personal topics (self and others); the description of China; the design of written product in the target language; expressing existence, preferences and agreement; comparing cultures
- ICGL 132 Elementary Chinese II** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICGL 131 Elementary Chinese I  
 The Chinese phonetic system (Pinyin), the Chinese writing system, the Chinese characters (approximately 100); fundamental Chinese grammar concepts (interrogative pronouns, classifiers, “de” particles, “de” phrase, adverbials, the continuation of an act sentence structures and the reduplication of verbs); scaffolding of basic vocabulary; basic communication about daily life topics; the design of written products in the target language; expressing simple points of view, describing people and daily life activities; comparing cultures
- ICGL 133 Elementary Chinese III** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICGL 132 Elementary Chinese II  
 The Chinese phonetics (Pinyin); The Chinese characters (approximately 150); Fundamentals of the basic Chinese grammar concepts (interrogative pronouns, modal verbs, complex sentence, modal particle “le” (了), complement of state, complement of result, complement of duration); scaffolding of basic vocabulary; basic communication about various topics; the design of written products in the target language; expressing points of view, telling direction, describing oneself and other people’s abilities; comparing cultures
- ICGL 141 Elementary Spanish I** **4 (4-0-8)**  
**Prerequisites:** Placement test  
 Fundamentals of the basic Spanish grammar (pronouns, present tense conjugation, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; basic communication about personal topics (self and others); an identification and a description of Spanish speaking countries; the design of written products in the target language; expressing existence, preferences and agreement; comparing cultures
- ICGL 142 Elementary Spanish II** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICGL 141 Elementary Spanish I  
 Fundamentals of the basic Spanish grammar (pronouns, present tense conjugation, reflexive verbs, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; basic communication about personal topics (self and others); an identification and a description of Spanish speaking countries; the design of written products in the TL; expressing existence, preferences and agreement; talking about daily habits
- ICGL 143 Elementary Spanish III** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICGL 142 Elementary Spanish II  
 Towns, quarters and cities; directions; past experience; present perfect tense, past tense indefinido; verbs ser, estar and hay; vocabulary of places; time markers for past tense; verbs empezar a+ infinitive; verbs ir / irse
- ICGL 160 Introduction to Thai Language and Culture** **4 (4-0-8)**  
**Prerequisites:** -  
 A communication in basic situations such as introducing oneself, asking for and giving directions, ordering food and drinks, asking for prices and bargaining at the same time, understanding selected topics of Thai culture in daily life
- ICGL 161 Elementary Thai I** **4 (4-0-8)**  
**Prerequisites:** Placement test  
 Listening and speaking skills on the following topics: introducing oneself, one’s friend and family, basic food and drink ordering, places, directions, transportation, buying tickets, clothing items, colours, and sizes; bargaining, counting and using classifiers; reading and writing Thai consonants; vowels placed after, before, above, and below the consonants; Thai numbers; live and dead syllables

- ICGL 162 Elementary Thai II** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICGL 161 Elementary Thai I  
 Listening and speaking skills on the following topics: one's schedule, making appointments, favourite leisure activities, ordering food, drinks, and desserts with special requests; presentation of one's plan for activities during the school break; a continuation of Elementary Thai I in reading and writing skills; the consonant clusters, tone marks, words with special spelling rules, reading short paragraphs
- ICGL 163 Elementary Thai III** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICGL 162 Elementary Thai II  
 Communication of the four skills on the following topics: booking or renting accommodation, symptoms of illness and visiting a doctor; selected holidays and festivals; a presentation of a selected province in Thailand; a continuation of Elementary Thai II in reading and writing skills, writing short paragraphs and reading long passages on selected topics
- ICGH 101 Biotechnology: from Science to Business** **4 (4-0-8)**  
**Prerequisites:** -  
 Biotechnology, bioethics, and the law, biotechnology and the regulatory framework, genetic testing, patenting life, biobanks and modern genomics research; genetically modified organisms; human and animal testing, bioterrorism; biological weapons laws, bio-prospecting, pharmaceutical pricing; the future of the human beings and post-humanism
- ICGH 102 Famous Arguments and Thought Experiments in Philosophy** **4 (4-0-8)**  
**Prerequisites:** -  
 An examination of the most striking argumentative moves in philosophy from Plato's Allegory of the Cave to Searle's Chinese Room and beyond; a transfer and an application of paradigmatic philosophical thinking to current open questions in politics and science
- ICGH 103 Logic, Analysis and Critical Thinking: Good and Bad Arguments** **4 (4-0-8)**  
**Prerequisites:** -  
 Basic formal tools from sentential and predicate logic; logical structures of arguments used in the everyday contexts of life; an analysis of their strengths and weaknesses; common fallacies in reasoning, including reasoning involving determining probabilities; a construction of good arguments using the principles of informal reasoning
- ICGH 104 Moral Reasoning: How can we know what is good?** **4 (4-0-8)**  
**Prerequisites:** -  
 A survey of philosophical, psychological, and scientific contributions to the understanding of moral values; a hands-on construction and an analysis of ethical argument regarding burning issues in applied ethics
- ICGH 105 Technology, Philosophy and Human Kind: Where Are We Now?!** **4 (4-0-8)**  
**Prerequisites:** -  
 An examination of major technological and scientific innovations across the globe and their effects on human life and thought; a focus on agriculture, steel, the printing press, the mechanical clock, magnifying lenses, antibiotics, electricity, steam and combustion engines, and the transistor
- ICGH 106 The Greeks: Crucible of Civilization** **4 (4-0-8)**  
**Prerequisites:** -  
 An introduction to and an overview of the philosophy and thought of Ancient Greece and its influence on contemporary civilization; theories about knowledge, propaganda, truth, art, psychology, happiness, justice, and democracy
- ICGH 107 Contemporary Art and Visual Culture** **4 (4-0-8)**  
**Prerequisites:** -  
 Current issues in society; the new media in art today; an analysis of images; social and historical contexts of contemporary art; creative thinking; the effects of globalization on the visual world; an investigation of broader social and cultural matters; subject matters related to ideology, gender, race, and ethnicity

- ICGH 108 Creative Drawing Expression** 4 (2-4-6)  
**Prerequisites:** -  
 Drawing in a variety of medium; drawing as creativity; re-presenting, expressing, texturizing, sublimating, juxtaposing, appropriateness, redefining, constructing, illustrating, and describing; drawing from life: human form; developing cognitive learning skills; utilizing visual communication, the design and art principles (experimentation, exploration, application, techniques for mark making, proportion, gesture, contour, action, weight, line, value, texture, composition); researching, interpreting, evaluating, and analysing contemporary artists; personal evaluation; personal expression
- ICGH 109 Creative Thinking Through Art and Design** 4 (2-4-6)  
**Prerequisites:** -  
 Combining a hands-on studio experience with demonstrations, lectures and discussions; developing creativity and gaining confidence in communicating one's own unique vision; exploring a variety of art and design mediums; understanding the elements of the visual language; implementing the creative process and creative thinking; developing individual solutions to open-ended problems
- ICGH 110 Drawing as Visual Analysis** 4 (2-4-6)  
**Prerequisites:** -  
 Developing creativity and cognitive learning skills; utilizing visual communication, the/a design and art principles; mark making; observing, analyzing, recording, representing plant and still life forms; practicing and applying, and using techniques for conventional pencil drawing tools (shape, form, perspective, lines, shading, value, negative space, texture, composition); scientific illustration; a realistic representational observation
- ICGH 111 Media Literacy: Skills for 21st Century Learning** 4 (4-0-8)  
**Prerequisites:** -  
 An integration of the media literacy, the media production, and the media ethics; accessing, analyzing, evaluating, questioning, and producing media texts; social, cultural, and political implications of the media; representations in the media; the media as political economy; the media aesthetics; the media and influence; audiences negotiating meaning
- ICGH 112 Photography** 4 (2-4-6)  
**Prerequisites:** -  
 An integration of visual literacy, photography techniques, and ethics; analyzing, evaluating, and authoring photographs; visual aesthetics; visual storytelling and narrative building techniques; the decisive moment; influencing audiences; maximizing the audience engagement; the ethical publications and the dissemination of photographs
- ICGH 113 Moving Pictures: A History of Film** 4 (4-0-8)  
**Prerequisites:** -  
 An investigation of European, American, and Asian films as art, philosophy, social commentary, and propaganda; a focus not only on techniques, styles, and technological advances but on the interpretation, comparison, and criticism
- ICGH 114 The Sound of Music: Form, Emotion, and Meaning** 4 (4-0-8)  
**Prerequisites:** -  
 A survey of a musical expressions and an analysis of its communicative force in light of current research; examples from a wide range of musical styles with a focus on classical music
- ICGN 101 Decision Mathematics** 4 (4-0-8)  
**Prerequisites:** -  
 Graphs and networks; linear programming; transportation problems; game theory
- ICGN 102 Essential Mathematics** 4 (4-0-8)  
**Prerequisites:** Placement test  
 Real numbers, algebraic expressions, percentages, ratio, proportion; linear functions; the systems of linear equations

- ICGN 103 Essential Statistics** 4 (4-0-8)  
**Prerequisites:** ICGN 102 Essential Mathematics  
Statistical ideas and concepts; probability and conditional probability; distribution functions; expected value; estimators; hypothesis testing; a linear regression analysis
- ICGN 104 Mathematics and Its Contemporary Applications** 4 (4-0-8)  
**Prerequisites:** Placement test or ICMA 100 Foundation Mathematics  
A review of algebra, logarithmic and exponential functions, matrix algebra, differential calculus, integral calculus
- ICGN 105 Ecology, Ecosystems and Socio-Economics in Southeast Asia** 4 (3-2-7)  
**Prerequisites:** -  
Human impacts on Southeast Asian ecology; human impacts on Southeast Asian's biodiversity and natural resources; fundamental ecological and resource management principles; current sustainable development issues; sustainable development practices for Southeast Asia
- ICGN 106 Climate Change and Human Society** 4 (4-0-8)  
**Prerequisites:** -  
Human activities and the global climate; consequences for human society; consequences for the essential life support systems; perspectives on human health and diseases; adapting to global climate change; mitigating global climate change; an optional field visit included
- ICGN 107 The Chemistry of Everyday Life** 4 (4-0-8)  
**Prerequisites:** -  
The air we breathe; ozone hole; water quality; acid-base and everyday chemicals; energy and fuels; battery; portable electronics; pharmaceuticals from nature; polymer and plastics; nutrition and modern life; genetic engineering; forensics and the DNA technology
- ICGN 108 Essentials of Culinary Science for Food Business** 4 (3-2-7)  
**Prerequisites:** -  
Changes during the preparation, heating, and storage of raw materials and finished products, food service and commercial packaged food industries; chemical, sensory, and nutritional natures of food, food safety concepts, changing trends and interests, legal requirements of the food establishment
- ICGN 109 Food for Health** 4 (4-0-8)  
**Prerequisites:** -  
Human nutritional requirements; health benefits of various foods; quality and safety of foods; food additives; food production and preservation; health and nutritional value
- ICGN 110 Maker Workshop** 4 (3-2-7)  
**Prerequisites:** -  
A mechanical design consideration, 3D drawing, safety in design; motion in 1 and 2 dimension; the sound and the oscillation motion, mechanical properties of materials; basic electronics, a circuit analysis, soldering; microcontroller, basic programming
- ICGN 111 Physics for CEO** 4 (4-0-8)  
**Prerequisites:** -  
Basic concepts of physics impacting individuals and society on a daily basis: physical quantities, the Newtonian mechanics and dynamics, energy and heat, electricity and magnetism, light and sound, and the electromagnetic spectrum
- ICGN 112 Stargazer** 4 (3-2-7)  
**Prerequisites:** -  
Basic ideas of astronomy, astrophysics, and cosmology; the progress of human understanding of the universe; the impact of the scientific methods on the astronomical observation; the earth and the moon; the solar system; the lifecycle of stars; Black Holes; galaxies; and the current understandings about the origins and the future of the universe

- ICGN 113 Plants, People and Poisons** 4 (4-0-8)  
**Prerequisites:** -  
The plant world; the way plants grow and reproduce; modern technologies used for improving agricultural methods; the basics of plant biology; the distinctions among major groups of plants; the social implications of plant use and abuse
- ICGN 114 The Scientific Approach and Society** 4 (4-0-8)  
**Prerequisites:** -  
Scientific literacy; the process of science discovery; verification, its limitation, and the influence on various disciplines; human research and animal research ethics; the critical analysis of current scientific articles; life cycle of scientific knowledge; modeling in science
- ICGN 115 Human Evolution, Diversity and Health** 4 (4-0-8)  
**Prerequisites:** -  
The Hominid evolution; primate societies; the origins of human species; the Order Primates; human distinctiveness and diversity; the scientific advancements and the human body; the scientific advancements and the modern society
- ICGN 116 Understanding and Visualizing Data** 4 (3-2-7)  
**Prerequisites:** -  
An introduction to data analytics; roles and examples of the data-driven decision making; technology landscape; data kinds and types; data sources and collection techniques; data storage and standard formats; data processing workflow; summary from data; different types of visualization; data visualization tools
- ICGN 117 Technology behind E-Business and Digital Strategies** 4 (3-2-7)  
**Prerequisites:** -  
Landscape of technologies in the digital enterprise and e-business; internet-based staples such as web hosting, domain-name acquisition, the social media, the payment systems; electronic business models and digital strategies; emerging trends in technology; legal and ethical issues
- ICGN 118 Everyday Connectivity** 4 (4-0-8)  
**Prerequisites:** -  
The Internet, computer networks, and the World Wide Web (W3) in daily life; troubleshooting small network problems; identifying threats and avoiding dangers online; finding credible information on the Web; online communication tools, such as the social media and email, for professional branding; the basic e-business concepts and tools; the e-payment systems
- ICGN 119 Computer Essentials** 4 (4-0-8)  
**Prerequisites:** -  
Digital literacy relating to computer literacy and information literacy; the computer hardware and its general functions; the operating systems; software packages and their daily use; computer security; the ethical use of the intellectual property
- ICGS 101 Accounting for Young Entrepreneurs** 4 (4-0-8)  
**Prerequisites:** -  
Fundamental accounting concepts; the basic accounting process used in small enterprises; the preparation of financial statements; the break-even analysis; business taxation
- ICGS 102 Business Sustainability and the Global Climate Change** 4 (4-0-8)  
**Prerequisites:** -  
A study of the role of business in the society; the basic concept of sustainability; global governance; sustainable development; social inequalities and social inclusion; environment sustainability; climate change; climate change mitigation; climate change adaptation; green marketing; business sustainability

- ICGS 103 Economics in Modern Business** 4 (4-0-8)  
**Prerequisites:** -  
Forces of demand and supply, elasticity, opportunity cost, market structures, pricing strategy, business enterprise, consumers' behavior; the Thai economy, the world economy, globalization and technological, profit maximizing, firm and organization, government policies, a business analysis and managerial decision-making, competitive advantage; the social media economy, innovation-based economy, digital sharing economy, aging society and dynamic business environment
- ICGS 104 Essentials of Entrepreneurship** 4 (4-0-8)  
**Prerequisites:** -  
Creating new businesses, capturing new markets, enhancing organizational effectiveness; entrepreneurship theories and frameworks, practices of promoting and managing start-ups; the life-cycle of an entrepreneurial venture; concept implementation, entrepreneurial pathway; the customer analysis, integrated marketing, funding, securing and managing capital, the human capital management under the disruptive environment
- ICGS 105 Personal Financial Management** 4 (4-0-8)  
**Prerequisites:** -  
Personal finance and investment; financial goals and planning process; financial statements and budgets; tax preparation; cash and savings management; investment planning; investing in stocks and mutual funds; making automobile and housing decisions; life insurance; protecting the property; retirement planning
- ICGS 106 Fashion and Society** 4 (4-0-8)  
**Prerequisites:** -  
The design elements of fashion, fashion terminology, fashion reflecting its temporal and spatial context, fashion and the development of art; fashion as a cultural expression, fashion as creativity; fashion requiring customers' approval and endorsements, fashion and consumer behaviour, fashion and consumerism, and ethical issues of fashion
- ICGS 107 MICE 101** 4 (4-0-8)  
**Prerequisites:** -  
An introduction to MICE industry; meetings; incentive travels; convention; exhibitions; decision-making criteria; special events; MICE event management; the venue management; logistics for MICE industry; service providers in MICE industry; standards in MICE industry; ethics for MICE
- ICGS 108 Money Matters** 4 (4-0-8)  
**Prerequisites:** -  
Financial issues related to money, rational choices, income and success; managing personal finances; markets and their functions; challenges in hard economic times; financial responsibility and basic money management skills
- ICGS 109 American History, Film and Modern Life** 4 (4-0-8)  
**Prerequisites:** -  
The history of modern America from the post reconstruction to the present; a survey history of the American political economy, society and international relations available in the modern media such as arts, film; influential thinking and writing; television channels and the social media; the state's power projection through hard and soft power; the American Innovative Industrialists; the Progressive Reformers; World War I; the Roaring Twenties; the Great Depression; Isolationism in the interwar years; Women's Suffrage; World War II; the Cold War; the Vietnam War; Racial Tensions; the Bush, Obama, Trump administrations and the future U.S. foreign policy
- ICGS 110 Development and Conflicts** 4 (4-0-8)  
**Prerequisites:** -  
Concepts of political and economic development; policies; production, and investment priorities; the consequences of economic transformation in poor countries; developmental failure since the 1980s; four development traps, including the conflict trap; the natural resource trap; the bad governance trap; and being landlocked with bad neighbours; solutions of how countries can achieve positive changes; the environmental and social development; the appropriateness and sustainability of the existing conventional development and growth trajectory

- ICGS 111 Exploring Religions** 4 (4-0-8)  
**Prerequisites:** -  
Major religions in the world, Hinduism, Buddhism, Sikhism, Chinese religions, Shinto, Judaism, Christianity, and Islam; the origins of the three religious groups, religions arising in India, China, and Japan, and of the family of Abraham; contemporary new religious developments; religious diversities present in the world
- ICGS 112 Geography of Human Activities** 4 (4-0-8)  
**Prerequisites:** -  
The interrelationship between humans and the spaces they create; human activities as interdisciplinary by nature; the physical and socially instructed environment people live in; human interactions shaping the human understanding of the environment; the utility of resources; the phenomena on the earth's surface related to human actions; concepts and geographical methodologies used to examine social organizations and environmental consequences
- ICGS 113 Perspectives on the Thai Past** 4 (4-0-8)  
**Prerequisites:** -  
The origins of the Thai people in pre-historic times to the late twentieth century; an alternative view incorporating the different regions and various ethnic groups making up present-day Thailand; key issues in Thai history; an analysis of the classics of Thai historiography; an evaluation and an interpretation of a range of primary sources dealing with the Thai past; understanding of how history is written
- ICGS 114 Power, Money and Behavior of Powerful States** 4 (4-0-8)  
**Prerequisites:** -  
Understanding the motives behind the inter-state relations; the increase of power, wealth and international prestige; tools states use to achieve objectives and the challenges of decision-making; foreign policies of the great power states having permanent seats and veto power on the UN Security Council; middle-power states including economically and politically advanced countries; critical issues such as nuclear weapons in North Korea; the war in Afghanistan; democratization or terrorism in failing states; and world trade; patterns and trends of foreign policy making of powerful states during the last century individually and in comparison with other states; case studies illustrating the policy decision-making to meet the contemporary international challenges
- ICGS 115 Sociology in the Modern World** 4 (4-0-8)  
**Prerequisites:** -  
Sociology as a field of study explaining social, political, and economic phenomena; social interactions and social organizations; sociological perspectives; methodologies and sociological insights; topics relevant to the modern world including culture, social groups, socialization process, deviance, family, religion, social inequality, gender, economic, politics, the media, and social change
- ICGS 116 Power and Politics** 4 (4-0-8)  
**Prerequisites:** -  
The understanding of the politics and the political systems of the current world; interactions and connections of different ideas; systems of thought and conflict in contemporary society; an analysis of political phenomenon
- ICGS 117 Overcoming Stereotypes, Prejudice and Discrimination** 4 (4-0-8)  
**Prerequisites:** -  
An analysis of psychological theories; psychological approaches to stereotypes, discrimination and prejudice; the emotional, behavioral and cognitive implications; the impact on our behavior and society; debiasing and metacognition
- ICGS 118 Skills in Dealing with People Across Cultures** 4 (4-0-8)  
**Prerequisites:** -  
The development of skills in dealing with people across cultures, covering topics such as: communication across cultures; parenting in different cultures; understanding consumers from different cultural backgrounds; emotions and motivation across cultures as well as approaches to deal with cultural diversity at work



<p><b>ICGS 119 World Politics</b></p> <p><b>Prerequisites:</b> -</p> <p>Different disciplinary perspectives on world politics; historical, geographical, anthropological, economic, and political approaches; specific regions in the world politics</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICGS 120 Global Awareness</b></p> <p><b>Prerequisites:</b> -</p> <p>The state of the world: key facts and trends of geography, economy, society, politics and the environment; global relationships: key economic, political, and environmental relations and trends; Thailand in the world: how Thailand impacts the world, and vice versa</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICGS 121 Abnormal Colleagues: how do I make this work?</b></p> <p><b>Prerequisites:</b> -</p> <p>The stigma of psychological issues; the fear of the workplace gossips and job security; an avoidance of getting treatment and counseling; a recognition of various disorders and devising strategies to effectively communicate and work with people; improving the workplace productivity and relationships</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICGS 122 Propaganda, Nudge Theory and Marketing: How to resist?</b></p> <p><b>Prerequisites:</b> -</p> <p>An examination of the science behind the 'mind control' and its implementation in the current society; an investigation of real and possible counter-strategies; a detailed psychological and socio-economic analysis of subtle oppressions of human autonomy in institutional, social, political, and economic practices</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICGP 101 American Flag Football</b></p> <p><b>Prerequisites:</b> -</p> <p>A ball based sport course emphasizing techniques; non-contact game play, including dodging, throwing, and catching and the development of teamwork management, communication, and terminology</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 102 Badminton</b></p> <p><b>Prerequisites:</b> -</p> <p>A racket based sport course stressing technique, strategies, grip, serving, positioning and movement; game play in both singles and doubles</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 103 Basketball</b></p> <p><b>Prerequisites:</b> -</p> <p>A ball based sport course emphasizing attentiveness, dribbling, passing, shooting, rebounding, ball control, game play, and the development of game strategies</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 104 Body Fitness</b></p> <p><b>Prerequisites:</b> -</p> <p>A comprehensive course in one or more exercise techniques: strength/resistance, cardio, plyometric, stretching, high-intensity interval training, and calisthenics; to maintain health and wellness</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 105 Cycling</b></p> <p><b>Prerequisites:</b> -</p> <p>A course designed on cycling instruction for safety, fitness, riding techniques, posture, communication, knowledge of the equipment and hazards, for recreational and commuter cycling</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 106 Discover Dance</b></p> <p><b>Prerequisites:</b> -</p> <p>A dance based course of current forms and techniques in one or more categories: African/Jazz, Worldwide Dances/Latin Dances, Professional Performance Dance, Modern Dance, Hip-hop/Funk</p>	<p><b>1 (0-2-1)</b></p>

<p><b>ICGP 107 Golf</b></p> <p><b>Prerequisites:</b> -</p> <p>A club based game course designed on developing correct grip, stance, posture, swing, and the knowledge of equipment, rules, regulations, and etiquette</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 108 Mind and Body</b></p> <p><b>Prerequisites:</b> -</p> <p>A course stressing meditation postures, techniques, movement, and breathing to achieve the positive mental state</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 109 Selected Topics in Sports</b></p> <p><b>Prerequisites:</b> -</p> <p>Learning concepts, rules and strategies through planned and structured movements by way of sport or activity to enhance a healthy lifestyle</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 110 Self Defense (Striking)</b></p> <p><b>Prerequisites:</b> -</p> <p>An external martial arts (striking) course emphasizing hard physical impact and exertion, muscular strength and tension, maximizing speed and power, through the body coordination</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 111 Self Defense (Grappling)</b></p> <p><b>Prerequisites:</b> -</p> <p>An internal martial arts (grappling) course stressing timing, awareness, precision, and techniques, using the body leverage for throwing, take downs, pins, and submissions</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 112 Soccer</b></p> <p><b>Prerequisites:</b> -</p> <p>A ball based sport course stressing alertness, ball control, including dribbling, passing, trapping, shooting, ball movement, game play, and development of strategies through drills and competitive play</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 113 Social Dance</b></p> <p><b>Prerequisites:</b> -</p> <p>A dance based social sport or activity course of choreographed movements, styles and regulations from the International Ballroom (Standard) and the International Latin dances</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 114 Swimming</b></p> <p><b>Prerequisites:</b> -</p> <p>A water based sport course stressing swimming techniques, breathing, and knowledge of buoyancy, propulsion, and water safety</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 115 Tennis</b></p> <p><b>Prerequisites:</b> -</p> <p>A racket based sport course of techniques, strategy, grip, serve, game play, ball tracking, timing, shot control, through drills, live ball hitting sessions, and competition</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICGP 116 Volleyball</b></p> <p><b>Prerequisites:</b> -</p> <p>A ball sport course emphasizing passing, setting, serving, developing strategies, positions, game play, teamwork management, and communication</p>	<p><b>1 (0-2-1)</b></p>

- ICHI 201 Principles of Management** **4 (4-0-8)**  
**Prerequisites:** 24 credits of General Education  
 An overview of management and organizational behavior; evolution of Management theories and thoughts; changing environment of organizations; foundation of individual behaviors; motivation; stress and work-life balance; decision making and problem solving; teamwork; communication; leadership; organization structure; ethics and social responsibility; service economies; organizational culture and change
- ICHE 101 Health Education** **2 (2-0-4)**  
**Prerequisites:** -  
 Practical approach to health behavior and obtain an understanding of risk factors as they relate to disease; develop a practical approach to health behavior and obtain an understanding of risk factors as they relate to disease.
- ICHI 202 Introduction to Hospitality and Tourism Industry** **4 (3-2-7)**  
**Prerequisites:** 24 credits of General Education  
 An introduction and overview of the tourism and hospitality industry, partnership in tourism and hospitality: global issues in tourism and hospitality, dynamics of the lodging industry, hotel management and operations: the foodservice concepts, dynamics of the event industry, leisure activities in tourism and hospitality: passenger transportation
- ICHI 203 Business Communication** **4 (4-0-8)**  
**Prerequisites:** ICGC 103 Public Speaking  
 Communication model; principles of business writing; business presentation; memos, emails and letters; cross-cultural communication; press release; country briefings; resume and cover letter; interview preparation; a mock interview
- ICHI 204 Digital Technology for Hospitality Industry** **4 (4-0-8)**  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
 An introduction to tourism and information technology and digital technology, strategic thinking and digital technology, digital landscape and the ecosystem, travel intermediaries and digital technology; the Internet and digital tourist, social media, mobile technology, digital technology for hospitality business; sustainable tourism and digital technology, and future of digital technology for tourism and hospitality industry
- ICHI 205 Consumer Behavior for International Hospitality Management** **4 (4-0-8)**  
**Prerequisite(s):** ICHI 202 Introduction to Hospitality and Tourism Industry  
 Understanding a wide range of factors motivating consumers in tourism products; an emphasis on culture and multicultural communication and relation; various factors that contribute to successful marketing in tourism; the purchase-decision process; typologies of tourist behavior from different practitioners; patterns of tourism demand and markets, divided by global region
- ICHI 206 Laws and Ethics for Hospitality and Tourism** **4 (4-0-8)**  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
 Legal principles and rules as infrastructure of legal knowledge towards business and tourism and hospitality industry; encouraging legal awareness in various legal exposures and managing legal issues including developing solutions and preventive measures thereof; the Global Codes of Ethics and Hospitality and Tourism Business
- ICHI 211 Hospitality and Tourism Managerial Economics** **4 (4-0-8)**  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
 Principles of economics, particularly microeconomics, and applied economic concepts; assessing the socio-economic behavior of economic agents comprising consumers, businesses, government and its agencies, particularly their business choices and decision making; covering key economic areas of demand, supply, elasticity, costing, pricing and investment

**ICHI 212 Accounting for International Hospitality Management 4 (4-0-8)**
**Prerequisites: ICGN 102 Essential Mathematics**

Business transactions and financial statements, the evolution of accounting, recording and classifying financial transactions, preparation of financial statements, features of various types of accounts, accounting principles, the usefulness and limitations of accounting information

**ICHI 213 Principles of Marketing 4 (4-0-8)**
**Prerequisites: ICHI 202 Introduction to Hospitality and Tourism Industry**

An introduction to fundamental marketing principles and practical; the marketing basics; definition, marketing's macro-environment, marketing planning techniques and understanding consumer behavior, marketing segmentation and target marketing; the developing promotional strategies; the communication mix, effective advertising, print materials discussions; customer relationship management (CRM) and marketing trends

**ICHI 221 Culinary Arts 4 (3-2-7)**
**Prerequisite(s): -**

Planning and operating food and beverage production in quantity food settings; various methods of food preparation; ingredients and culinary terminology; reading and evaluating menus; developing recipe conversion and costing skills; examining different production schemes and product flow; the use and care of equipment; service techniques; procurement management, and cost control

**ICHI 222 Baking and Pastry Business 4 (3-2-7)**
**Prerequisites: -**

Basic theory and skill sets used throughout the field of baking and pastry; using hand tools and equipment found in a bakeshop; exploring the baking and pastry ingredients and their functions; describing of the major methods such as beating, blending, creaming, cut in and folding; understanding the course materials by tasting and evaluating products created in class; identifying and selecting quality grains, fruits, vegetables, thickening agents, nuts and seeds, dairy products, baking spices, eggs and egg products, flours, chocolates, fats, and oils used in the baking field; business of baking and pastry

**ICHI 301 People and Talent Management 4 (4-0-8)**
**Prerequisites: ICHI 201 Principles of Management**

An overview and survey of human resources management and development; differences of personnel and human resources administrative system, recruitment and selection, job design, training and development together with talent management, performance and compensation management, ethics management and labor relation

**ICHI 302 Service Management 4 (4-0-8)**
**Prerequisites: ICHI 202 Introduction to Hospitality and Tourism Industry**

Important roles of services in our economy; the nature of services and service encounters; characteristics of services; the customer focus on service management; the consumer decision model; service psychology; service strategy and competitiveness; the design and development of services and service delivery systems; service failure and recovery; managing demand and supply in services; service quality and continuous improvement; tools and technique for total quality improvement; managing customer experience; ethical challenges in service management

**ICHI 311 Sustainable Development in Hospitality and Tourism 4 (4-0-8)**
**Prerequisites: ICHI 202 Introduction to Hospitality and Tourism Industry**

Concepts of sustainability affecting tourism and hospitality industry; socio-cultural, environmental, economic impacts of tourism; visitor management and interpretation for sustainable development; creative tourism for promoting culture-based creativity and sustainability of tourism; sustainability accreditation for tourism and hospitality; concepts of community-based tourism practices for sustainable development within a different geo-cultural context – urban and rural settings

**ICHI 312 Crisis and Risk Management for Hospitality Industry 4 (4-0-8)**
**Prerequisites: ICHI 202 Introduction to Hospitality and Tourism Industry**

The relationships and differences among risk, crisis, risk management, and crisis management in the context of international hospitality industry; importance of risk and crisis management in the contemporary world; relevant frameworks in risk management; relevant frameworks in crisis management; equipment and procedures to create safety and security in international hospitality industry, hospitality and event venues; roles of customers in the development of personal safety and security; strategies in managing and restoring businesses through selected case studies from local and international tourism, hospitality and event organizations

- ICHI 313 Hospitality Branding and Marketing Communications** 4 (4-0-8)  
**Prerequisites:** ICHI 213 Principles of Marketing  
Hospitality marketing and branding (Past and Future); brand model management; branding of services; brand identity; brand positioning; brand equity; the process of marketing communications; the models of marketing communications; media for marketing communications and IMC; factors influencing the use of media for marketing communications
- ICHI 314 Finance for International Hospitality Management** 4 (4-0-8)  
**Prerequisites:** ICHI 212 Accounting for International Hospitality Management  
An introduction to the financial management for hospitality industry, methods and importance of tourism and hospitality finance, cash management and its importance, the investment decisions regarding tourism and hospitality projects and capital expenditures, cash control during the various stages of operations, statement of cash flow, an introduction to feasibility studies, financial ratios analysis and working capital
- ICHI 321 Lodging Property Management** 4 (4-0-8)  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
An overview of the lodging industry, organizational structures of hotels and resorts, hotel/resort development, front office management, hotel safety and security, housekeeping management, food and beverage management, marketing and sales management, human resources management
- ICHI 322 Hospitality Facilities Design** 4 (3-2-7)  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
Understanding fundamental of hospitality facility design and layout emphasizing different types of lodging; basic understanding of architectural plan reading and specifications as well as how to communicate with professional designers; exploring flow patterns and relationships among functional areas and facilities (using the Bubble Diagram); understanding phases in planning and design process; and recognizing possible key factors, theme or concept, and trends influencing hospitality facilities design
- ICHI 323 Front Office Management** 4 (4-0-8)  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
Traditional hotel industry; modern hotel industry; structures of the hotel industry; front office responsibilities; front office operations; reservations; registrations; the assignment and rooming; front office accounting; checkout and settlement; managing guest services; handling corporate and group sales; overview of revenue management; technology relating to front office tasks
- ICHI 324 Housekeeping Management** 4 (4-0-8)  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
An introduction to housekeeping; role of the housekeeping department; housekeeping operations in the guest room and public space; housekeeping administrative tasks; managing human resources in the housekeeping department; managerial responsibilities of the executive housekeeper; safety for housekeeping tasks; facility care and cleaning; laundry; housekeeping technology
- ICHI 325 Food and Beverage Management** 4 (4-0-8)  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
Understanding fundamental of food composition and properties, food and beverage products and preparation, and food safety and sanitation; developing standardized recipes; creating menus including food and beverage costing and pricing and food and wine paring; discussing about purchasing, cost controls, storage and loss prevention; meeting legal safety and sanitation requirements; building business through effective marketing
- ICHI 326 Spa and Health Resort Management** 4 (4-0-8)  
**Pre-requisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
Understanding the essential fundamental in spa and health resort operation and management; types of spa and its operation, the operational management like menu design, product, pricing, staffing and service excellence; the concept, design and trends of spa facilities and services

**ICHI 331 Tour Guiding and Heritage Interpretation**
**4 (3-2-7)**
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry

Principles of tourist guides - etiquette, personalities, roles and responsibilities; understanding tourist behaviors; managing the unexpected; principles of interpretation for heritage attractions; model of creating visitor experiences; thematic interpretation; essential knowledge of cultural heritage in Thailand, especially from the Ayutthaya to modern Bangkok, including a field work held at outstanding tourist attractions in Bangkok

**ICHI 332 Tour Package Management**
**4 (3-2-7)**
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry

Package tourism management; the crucial relationships of various tour components such as transportation, lodging, dining, sightseeing, attractions and shopping, understanding different types of tour operators, basic types of organizational structures, tour distribution channels and appreciate the ways in destination research development and supply negotiations. Tour itinerary planning and understand how to strategically price the tour, specific communications strategies of tour operators, understanding the three major functions of tour operations; pre-tour operation, tour execution, and post-tour phase, an administration of tour operation and its environment

**ICHI 333 Wine Studies and Wine Tourism**
**4 (3-2-7)**
**Prerequisites:** Age above 20

Viticulture; viniculture; old world and new world wine; sparkling wine; fortified wine; food and wine pairing; ethical issues of wine drinking; global wine tourism; motivations of wine tourists; factors essential for giving wine tourists total touring experiences; marketing plan for wine tourism

**ICHI 334 Airline Management**
**4 (4-0-8)**
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry

An introduction to aviation industry; global development history of airlines; airline business organization; airline product development and customer relationship management; airline planning and distribution; principle of airline economics; airline promotion and marketing communication; airline business models and low cost airlines; international bodies (ICAO, IATA); airline in-flight and cargo services; airline growth and sustainable development

**ICHI 335 Social Media Management for Tourism Business**
**4 (4-0-8)**
**Prerequisites:** ICHI 204 Digital Technology for Hospitality Industry

An introduction to social media, social consumers and digital communities, social media landscape, tourism business ecosystem, social media strategic planning, social media publishing and branding, social entertainment, social commerce and social media analytical tools and measurement

**ICHI 336 Cultural Heritage Management**
**4 (4-0-8)**
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry

The definition of cultural heritage, cultural heritage in Thailand, its laws, major cultural sites in Thailand; heritage management worldwide; tangible and intangible heritage; heritage as tourist attractions; marketing heritage; sustainable heritage; heritage as tourist product; the future of heritage and tourism

**ICHI 337 Tourism in ASEAN Countries**
**4 (4-0-8)**
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry

Tourism in ASEAN; tourism; significance of tourism in the ASEAN economy; government planning and policies in the ASEAN; international and domestic tourism in the ASEAN; tourism impacts in the ASEAN; tourism and sustainability in the ASEAN; tourism and terrorism in the ASEAN; voluntourism in the ASEAN; medical tourism in the ASEAN; dark tourism in the ASEAN; sex tourism in the ASEAN

**ICHI 341 Event Management Fundamentals**
**4 (4-0-8)**
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry

Event characteristics, typology; social, economic, political and development implications of events; event stakeholders management; event design; event planning; event organization, event finance, event operations; event evaluation; event trends and technology

- ICHI 342 Event Project Management** **4 (3-2-7)**  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
 Project management for events; supply and suppliers; event project definition; stakeholder management; event scope; resources analysis; task analysis; scheduling; work in progress report; project completion and review
- ICHI 343 Sport Event Management** **4 (3-2-7)**  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
 An introduction and overview of sport event; understanding the sports event industry  
 Event Organization and Conceptualization; event staffing, financial planning, and event revenue maximization; event Sponsorship; media promotion and relations; event services and logistics; event day management; post event details and evaluation
- ICHI 344 Special Topics** **4 (4-0-8)**  
**Prerequisites:** ICHI 202 Introduction to Hospitality and Tourism Industry  
 Selected topics in the international hospitality industry. An analysis of contemporary issues that arise and impact on the hospitality industry
- ICHI 345 Event and Experience Design** **4 (3-2-7)**  
**Prerequisites:** -  
 Understanding an overview of event design; the formation and construction of experience; key design of experience; the relationships between event interaction and experience; the relationships between communication and event design; conceptualization and planning; process of event design operations; entertainment design; designing sustainable event; involving technology in event to enhance experience; evaluating event design; event design in consideration of event legacy; Identifying and finding current and examine future trends in event design
- ICHI 391 Internship I (Hotel Operation)** **12 (0-36-12)**  
**Prerequisites:** 80 earned credits  
 Providing hands-on experience and practical opportunity in the hotel operation of four departments: front office, housekeeping, food and beverage and kitchen; provision of hotel and service related basic knowledge and skill in the four departments; achieving formality, professionalism, attitude and team work aspects; building competitive advantage as a quality hotelier
- ICHI 392 Internship I** **12 (0-36-12)**  
**Prerequisites:** 80 earned credits  
 Providing hands-on experience and practical opportunity on travel service operations; providing hotel or travel related service skills and knowledge on the necessary functions; grooming the interns on formality, professionalism, service excellence, attitude and team work aspects including understanding customer's demand & expectation so as to build a competitive advantage and a highly competent human capital.
- ICHI 411 Revenue Management for Hospitality Industry** **4 (4-0-8)**  
**Prerequisites:** ICHI 313 Hospitality Branding and Marketing Communications  
 The concepts of revenue management; ingredients of effective revenue management; roles of revenue manager and related department; Key Performance Index used in the revenue management; market segmentation and channel distribution the in revenue management; market and competitive intelligence; benchmarking and competitive set; price and value; economics in revenue management; demand Forecasting; revenue management techniques in hospitality business; market dynamics.
- ICHI 412 Entrepreneurship and Strategic Management for International Hospitality Management** **4 (4-0-8)**  
**Prerequisites:** ICHI 201 Principles of Management  
 Entrepreneurial and strategic issues in management; formulation and analysis of strategies; relationship between strategies and organizational structures; strategic thinking and managing change and the similarities and differences in strategies between sectors in relation to tourism and hospitality industry
- ICHI 413 Research Methods for International Hospitality Management** **4 (4-0-8)**  
**Prerequisites:** ICGN 103 Essential Statistics and 150 credits  
 The design of experiments, collection of data, presentation of data, an analysis of current trends in research industry, how to write a literature review, and analyze the research results
- ICHI 491 Internship II** **12 (0-36-12)**  
**Prerequisites:** Final trimester only  
 Work experience at a hospitality / tourism / event-related organization; gaining an insight in its management and operations; making an effective contribution to the employing organization; gaining first-hand experience of a real working environment and, in particular, the problems encountered in human, financial and other resource terms, in trying to meet organizational objectives, and understand



how such problems are tackled; demonstrating an ability to understand their roles in the work of the organization by implementing instructions, directing, understanding, assuring appropriate actions, and carrying out tasks assigned to the students successfully; developing interpersonal and technical skills, as well as competencies necessary for the successful completion of students work; considering and discussing with work colleagues and supervisors the relationship between the theoretical concepts and the practical situations encountered; applying careful thoughts to ways in which this experience may help students to plan their future

#### **ICHL 101 Japanese I for Hospitality and Tourism Industry**

**4 (4-0-8)**

##### **Prerequisites: Placement test**

The Hiragana and Katakana characters; fundamentals of basic Japanese grammar (noun-ending sentences, particles, demonstratives, verb-ending sentences, non-past and past tenses); scaffolding of basic vocabulary; the basic communication about personal topics (self and others); description of Japan; the design of written products in the target language; expressing existence, preferences, and agreement; comparing cultures

#### **ICHL 102 Japanese II for Hospitality and Tourism Industry**

**4 (4-0-8)**

##### **Prerequisites: Placement test or ICHL 101 Japanese I for Hospitality and Tourism Industry**

The Kanji characters (approximately 50); fundamentals of basic Japanese grammar concepts (particles, verbs of giving and receiving, na-adjective-ending sentences, i-adjectives-ending sentences, non-past and past tenses, and classifiers); scaffolding of basic vocabulary; the basic communication about daily life topics; the design of written products in the target language; expressing simply points of view, describing people and daily life activities; comparing cultures

#### **ICHL 103 Japanese III for Hospitality and Tourism Industry**

**4 (4-0-8)**

##### **Prerequisites: Placement test or ICHL 102 Japanese II for Hospitality and Tourism**

The Kanji characters (approximately 50); fundamentals of basic Japanese grammar concepts (verb conjugation (masu-form, te-form, nai-form, and dictionary form), and related sentence patterns; polite style of speech, and plain style of speech, particles); scaffolding of basic vocabulary; the basic communication about various topics; the design of written products in the target language; expressing points of view, describing people and various activities; comparing cultures

#### **ICHL 104 Japanese IV for Hospitality and Tourism Industry**

**4 (4-0-8)**

##### **Prerequisites: Placement test or ICHL 103 Japanese III for Hospitality and Tourism Industry**

50 Kanji characters; expressing opinions, impressions, and expectations; reporting or quoting other's statements; describing and explaining people and things in details; giving directions; describing kind actions of other people using appropriate verbs; stating decisions, judgments, etc. based on the suppositions; asking for explanations, and explaining one's situations or reasons; asking for advices and instructions; expressing what one can or cannot do using potential verbs

#### **ICHL 105 Japanese V for Hospitality and Tourism Industry**

**4 (4-0-8)**

##### **Prerequisites: Placement test or ICHL 104 Japanese IV for Hospitality and Tourism**

50 Kanji characters; explaining state of things; describing necessary things to do in advance as preparations for the future; expressing own intentions, plans, and schedule; expressing own guess and inference; asking someone to take a message or conveying a message; stating standards or norms, when one explains the manner of doing a certain action or work; explaining a condition in which a certain action is performed; stating everyday habitual actions

#### **ICHL 106 Japanese VI for Hospitality and Tourism Industry**

**4 (4-0-8)**

##### **Prerequisites: Placement test or ICHL 105 Japanese V for Hospitality and Tourism Industry**

50 Kanji characters; expressing judgments under certain conditions; stating a purpose or an aim; describing changes in human ability and conditions; describing an action performed by a third person, or an action when one feels annoyed or troubled, using passive verbs; expressing something with the most important information emphasized; describing natural phenomena, happenings, and events, together with their causes; clearly telling what speakers consider as questions, by using a question with an interrogative as a component of a sentence; using appropriate expressions for giving and receiving of things and actions, depending on the relationship between the giver and the receiver, in terms of social status; telling usage, evaluation, necessary time, expense, etc.



- ICHL 107 Japanese VII for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 106 Japanese VI for Hospitality and Tourism Industry  
 50 Kanji characters; telling a supposition based on the appearance of a thing, person and scene; expressing that the degree of an action or a state is excessive; describing the easiness or difficulty in handling or doing something; expressing feelings of surprise, disappointment or dissatisfaction when an expected consequence did not follow; describing how to cope with a situation or its consequence under a hypothetical situation; telling an action, stressing a certain point in time during the course of the action; expressing that one is convinced and certain of what he/she states; giving compulsion and permission; seeking permission politely; understanding Japanese view on relationship based on seniority, social status and insider/outsider relationships; understanding the entire system of all respectful expressions and humble expressions
- ICHL 108 Japanese VIII for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 107 Japanese VII for Hospitality and Tourism Industry  
 The 50 Kanji characters; explaining cultural aspects; discussing about natural disaster; comparing education systems; understanding and presenting graphs and charts; talking about health
- ICHL 109 Japanese IX for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 108 Japanese VIII for Hospitality and Tourism Industry  
 The 50 Kanji characters; report about invention; discussion on issues related to natural environment; understanding cultural differences; discussion on social issues
- ICHL 110 Japanese X for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 109 Japanese IX for Hospitality and Tourism Industry  
 An analysis of texts of various kinds chosen from the fields and topics of interest of the students and production of similar written documents, in order to prepare the students for the written skill part of a standard intermediate level proficiency test
- ICHL 111 Japanese XI for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 110 Japanese X for Hospitality and Tourism Industry  
 An analysis of various audio documents (such as TV and radio broadcast, plays and films) chosen according to the fields and topics of interest of the students and the production of similar documents, in order to prepare the students for the oral skill part of a standard intermediate level proficiency test
- ICHL 121 Chinese I for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test  
 The Chinese phonetic system (Pinyin), Chinese basic writing system (Stroke order), Chinese characters (approximately 100) and fundamentals of basic Chinese grammar (interrogative pronouns, particle 的“de”, Yes/No questions with 吗“ma”, demonstrative pronouns, classifiers, adverb “也”, “dou” 都); Scaffolding of basic vocabulary; the basic communication about personal topics (self and others); description of China; the design of written product in the target language; expressing existence, preferences and agreement; comparing cultures
- ICHL 122 Chinese II for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 121 Chinese I for Hospitality and Tourism Industry  
 The Chinese phonetic system (Pinyin), Chinese writing system, Chinese characters (approximately 100); fundamental Chinese grammar concepts(interrogative pronouns, classifiers, “de” particles, “de” phrase, adverbials, continue of an act sentence structures and reduplication of verbs); scaffolding of basic vocabulary; the basic communication about daily life topics; the design of written products in the target language; expressing simply points of view, describing people and daily life activities; comparing cultures
- ICHL 123 Chinese III for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 122 Chinese II for Hospitality and Tourism Industry  
 Chinese phonetics (Pinyin); Chinese characters (approximately 150); fundamentals of basic Chinese grammar concepts(interrogative pronouns, modal verbs, complex sentence, modal particle “le”(了), complement of state, complement of result, complement of duration); scaffolding of basic vocabulary; the basic communication about various topics; the design of written products in the target language; expressing points of view, telling direction, describing oneself and other people’s abilities; comparing cultures

**ICHL 124 Chinese IV for Hospitality and Tourism Industry 4 (4-0-8)**

**Prerequisites:** Placement test or ICHL 123 Chinese III for Hospitality and Tourism Industry

Reading and summarizing passages, writing letters, relate travel experience, describing one's appearance, the preposition "ba". (The preposition "ba" and its object which together function as an adverbial clause in sentences with verbs being the predicate.), expressing the continuation of an act, complement of direction, describing the degree level of state of things as they change over time, Chinese culture on weddings

**ICHL 125 Chinese V for Hospitality and Tourism Industry 4 (4-0-8)**

**Prerequisites:** Placement test or ICHL 124 Chinese IV for Hospitality and Tourism Industry

Expressing one's feelings. i.e. sadness, happiness, anger, pain, etc., relate someone's experience and evaluate behavior, the preposition "ba" (continued), express passive meaning by using the prepositions "bei", "jiao", "rang", complement of potentiality (I); reduplication of numeral-quantifier compounds; Chinese culture and custom on how to decorate a house.

**ICHL 126 Chinese VI for Hospitality and Tourism Industry 4 (4-0-8)**

**Prerequisite(s):** Placement test or ICHL 125 Chinese V for Hospitality and Tourism Industry

Making and declining invitations and requests; expressing agreements and disagreements; expressing one's wishes, and indicating the result of an act using complements of direction, the flexible use of interrogative pronouns, rhetorical questions to express affirmation or negation, complement of potentiality (II); Chinese idioms and proverbs

**ICHL 127 Chinese VII for Hospitality and Tourism Industry 4 (4-0-8)**

**Prerequisites:** Placement test or ICHL 126 Chinese VI for Hospitality and Tourism Industry

Elements of intermediate grammar and vocabulary related to specialized contexts allowing the students to participate in discussions on specific topics, expressing opinions and asking for clarification in such contexts, reading a wider variety of long texts, and writing extended letters or narratives; asking and giving advice, words of consolation, writing about travelling, expression of assumption, Chinese idioms expressing feeling of sorrow and grievance; rules and regulations for entering China, the belief of good and bad luck, Chinese traditional style house (Siheyuan), Peking Opera; existence emergence sentence, indirect refusal of a request, reduplication adjective used as an adverbial; conjunctions

**ICHL 128 Chinese VIII for Hospitality and Tourism Industry 4 (4-0-8)**

**Prerequisites:** Placement test or ICHL 127 Chinese VII for Hospitality and Tourism Industry

More advanced grammar and vocabulary related to a wider variety of specialized contexts allowing the students to begin, hold, and close extended conversations and discussions related to specialized topics and situation, and read and write simple argumentative texts related to such contexts; Chinese proverbs (1), idioms and expressions (1), poems (1), making a comparison; tourist attractions in China, Chinese dialects, Qingming festival; three Gorges of the Yangtze river 被 (bei) sentence; the complement of potentiality; prepositions; auxiliary verbs; continuity of an act; adverbs

**ICHL 129 Chinese IX for Hospitality and Tourism Industry 4 (4-0-8)**

**Prerequisites:** Placement test or ICHL 128 Chinese VIII for Hospitality and Tourism Industry

The consolidation of the acquisitions of ICHL 127 and 128 and further mastering of advanced grammar and specialized vocabulary in order to allow the students to fully reach a standard intermediate level of proficiency; giving warnings, note taking, memo writing, indication of unexpected situation with a tone exclamation, Chinese proverbs (2), idioms and expressions (2), poems (2), mid-autumn festival, summer activities for the young people in China; recent developments in Chinese families; adverbs, phrases, conjunctions, auxiliary verbs (2).

**ICHL 130 Chinese X for Hospitality and Tourism Industry 4 (4-0-8)**

**Prerequisites:** Placement test or ICHL 129 Chinese IX for Hospitality and Tourism Industry

An analysis of texts of various kinds (press, advertisements, literature, reports, etc.) chosen according to the fields and topics of interest of the students and production of similar written documents, in order to prepare the students for the written skill part of a standard intermediate level proficiency test

- ICHL 131 Chinese XI for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 130 Chinese X for Hospitality and Tourism Industry  
 An analysis of various audio documents (such as TV and radio broadcast, plays and films) chosen according to the fields and topics of interest of the students and the production of similar documents, in order to prepare the students for the oral skill part of a standard intermediate level proficiency test
- ICHL 141 French I for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test  
 Fundamentals of basic French grammar (pronouns, present tense conjugation, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; the basic communication about personal topics (self and others); identification and description of French speaking countries; the design of written products in the target language; expressing existence, preferences and agreement; comparing cultures
- ICHL 142 French II for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 141 French I for Hospitality and Tourism Industry  
 Fundamentals of simple French grammar (present and future tense, adjective gender, place and agreement, more complex prepositions, more complex questions) Scaffolding of simple vocabulary; simple communication about daily life topics (in France and in their country); the design of written products in the target language; expressing simply point of view, describing people and daily life activities; comparing cultures
- ICHL 143 French III for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 142 French II for Hospitality and Tourism Industry  
 Fundamentals of more complex French grammar (present and future tense, adjective gender, place and agreement, more complex prepositions, questions and past tense notions); scaffolding of more complex vocabulary; longer communication about daily life topics (in France and in their country); the design of written products in the target language; expressing point of view, describing people and daily life activities; comparing cultures
- ICHL 144 French IV for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 143 French III for Hospitality and Tourism Industry  
 Talking about friends; describing someone; looking for and applying for a job; giving advice; talking about professional activities and professional experiences; reporting speeches (1); relative pronouns: qui, que, à qui; Imparfait and passé composé tenses; subjunctive mood to express necessity
- ICHL 145 French V for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 144 French IV for Hospitality and Tourism Industry  
 Talking about a country; understanding tourist information and making a reservation. talking about one's living environment; justifying a choice; talking about a movie; relative pronouns: où, dont ; pronouns en and y; Gerundive form. Past tenses review: imparfait / passé composé / plus-que-parfait ; passive voice (1)
- ICHL 146 French VI for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 145 French V for Hospitality and Tourism Industry  
 Expressing wishes; to make a suggestion; talking about a project; talking about a book or an article; expressing aims, causes and consequences; to expressing agreements and disagreements; talking about changes in life; expressing a regret; subjunctive mood to express wishes; conditional mood to make a suggestion; reported speeches and time accordance; past conditional to express past hypothesis and regret
- ICHL 147 French VII for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 146 French VI for Hospitality and Tourism Industry  
 talking about one's own image and look, asking information and advice by email; describing people and their behaviours; speaking highly of someone; giving suggestion and reproach; expressing feelings (2); giving advice and order; talking about consumption; writing a claim by email; negotiating a price; complaining about a service; reporting a third person's speech and warning someone

- ICHL 148 French VIII for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 147 French VII for Hospitality and Tourism Industry  
 More advanced grammar and vocabulary related to a wider variety of specialized contexts allowing the students to begin, hold and close extended conversations and discussions related to specialized topics and situation; reading and writing simple argumentative texts related to such contexts; talking about one's own image and look, asking information and advice by email; describing people and their behaviours; speaking highly of someone; giving suggestions and reproaches; expressing feelings (2); giving advice and order; talking about consumption; writing a claim by email; negotiating a price; complaining about a service; reporting a third person's speech and warning someone
- ICHL 149 French IX for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 148 French VIII for Hospitality and Tourism Industry  
 Consolidation of the acquisitions of ICHL 147 and 148 and further mastering of advanced grammar and specialized vocabulary in order to allow the students to fully reach a standard intermediate level of proficiency; talking about studies and learning tools; talking about one's experience in a curriculum vitae; talking about the past; conceding and opposing in an argumentative speech (1); talking about the press: newspapers and magazines, talking about an event in an article; giving information by letter or mail; understanding and introducing newspaper's articles; expressing and defending an opinion; encouraging and promoting solidarity; to ask detailed information by email; expressing aims; expressing duration with time indicators
- ICHL 150 French X for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 149 French IX for Hospitality and Tourism Industry  
 An analysis of texts of various kinds (press, advertisements, literature, reports, etc.) chosen according to the fields and topics of interest of the students and production of similar written documents, in order to prepare them for the written skill part of the standard intermediate level proficiency test
- ICHL 151 French XI for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 150 French X for Hospitality and Tourism Industry  
 An analysis of various audio documents (such as TV and radio broadcast, plays and films) chosen according to the fields and topics of interest of the students and the production of similar documents, in order to prepare the students for the oral skill part of a standard intermediate level proficiency test
- ICHL 161 German I for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test  
 Greetings, introducing oneself or others, German alphabet and phonemes, personal information, numbers from 1 – 100 and price quotations, expressing wishes, telling the time and making appointments; quality of items, measurements; verb forms, pronouns, sentence structure, gender of nouns, accusative case and plural forms, negation
- ICHL 162 German II for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 161 German I for Hospitality and Tourism Industry  
 Ordering and paying for meals in a restaurant, preferences of food and drinks, giving and asking for directions, reading a map, preferences of work conditions, job advertisements; essay writing, yes/no questions, imperative forms, compound verbs, preposition with dative case, modal verbs I, German sentence bracket
- ICHL 163 German III for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisite(s):** Placement test or ICHL 162 German II for Hospitality and Tourism Industry  
 Health advice and problems, healthy and unhealthy life styles, events and accidents, travel reports, curriculum vitae (CV); possessive articles in nominative, accusative and dative case, perfect tense, connectors, modal verbs II
- ICHL 164 German IV for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 163 German III for Hospitality and Tourism Industry  
 Clothing and accessory, appearance, shopping for clothes and accessory family members, present and past families, statistics, festivities and culture, dates, presents; comparative forms of adjectives, modal verbs past tense, dependent clauses (cause and condition), personal pronouns, accusative and dative case

**ICHL 165 German V for Hospitality and Tourism Industry****4 (4-0-8)****Prerequisites: Placement test or ICHL 164 German IV for Hospitality and Tourism Industry**

Housing II, furniture and equipment II, school and education, the school system in Germany; future plans, appearance II, fashion and life style, the description of persons; dependent clauses II, future tense, declination of adjectives.

**ICHL 166 German VI for Hospitality and Tourism Industry****4 (4-0-8)****Prerequisites: Placement test or ICHL 165 German V for Hospitality and Tourism Industry**

Travel, weather and seasons, public transport; free time, learning to know people abroad, clubs, work and job search, job advertisement and application; impersonal verbs, modal verbs III, relative clauses, indefinite pronouns, phrasal verbs, dependent clauses (concessive).

**ICHL 167 German VII for Hospitality and Tourism Industry****4 (4-0-8)****Prerequisites: Placement test or ICHL 166 German VI for Hospitality and Tourism Industry**

The media, statistics, habits in using media, argumentation about media, texts about media (reading and writing); politics, opinion about politics, wishes about politics, good and bad manners in different cultures, invitations in different cultures, rules of politeness, intercultural comparisons; question words (summary), adjective suffixes and prefixes, adjective antonyms, past tense (regular and irregular); verbs with fixed prepositions, prepositions with dative, temporal dependent clauses

**ICHL 168 German VIII for Hospitality and Tourism Industry****4 (4-0-8)****Prerequisites: Placement test or ICHL 167 German VII for Hospitality and Tourism Industry**

Describing people, asking for information on the telephone, describing advantages and disadvantages, reserving a room, complaining, expressing praise, applying for a job on the phone, understanding a travel brochure, talking about eating habits, understanding tips for a healthy diet, ordering and paying in a restaurant, giving advice; prepositions with accusative (summary), indirect question phrases, indirect and direct questions, masculine nouns n-declinations, regular and irregular comparative forms, declination of articles, superlatives, and adjective endings; infinitive groups with zu, concessive dependent clauses, word formation: noun formation

**ICHL 169 German IX for Hospitality and Tourism Industry****4 (4-0-8)****Prerequisites: Placement test or ICHL 168 German VIII for Hospitality and Tourism Industry**

Understand texts about history, talking about occurrences in the past, talking about migration, expressing opinions on Europe, talking about relationships, expressing feelings, expressing opposites, resolving conflicts, defining problems and express wishes; reporting an emergency, talking to a doctor, talking about health care jobs; past: past tense and present perfect, past perfect, temporal dependent clauses, conjunctions, dependent clauses with während as opposite, temporal dependent clauses with bis and bevor; word formation: character descriptions with verbs and shortened forms; relative clauses in nominative, accusative, and dative, relative pronouns: declinations, word formation: nouns.

**ICHL 170 German X for Hospitality and Tourism Industry****4 (4-0-8)****Prerequisites: Placement test or ICHL 169 German IX for Hospitality and Tourism Industry**

An analysis of texts of various kinds (press, advertisements, literature, reports, etc.) chosen according to the fields and topics of interest of the students and production of similar written documents, in order to prepare the students for the written skill part of a standard intermediate level proficiency test

**ICHL 171 German XI for Hospitality and Tourism Industry****4 (4-0-8)****Prerequisites: Placement test or ICHL 170 German X for Hospitality and Tourism Industry**

An analysis of various audio documents (such as TV and radio broadcast, plays and films) chosen according to the fields and topics of interest of the students and the production of similar documents, in order to prepare the students for the oral skill part of a standard intermediate level proficiency test

- ICHL 181 Spanish I for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test  
 Fundamentals of basic Spanish grammar (pronouns, the present tense conjugation, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; the basic communication about personal topics (self and others); identification and description of Spanish speaking countries; the design of written products in the target language; expressing existence, preferences and agreement; comparing cultures
- ICHL 182 Spanish II for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 181 Spanish I for Hospitality and Tourism Industry  
 Fundamentals of basic Spanish grammar (pronouns, present tense conjugation, reflexive verbs, gender/number, adjectives, prepositions); scaffolding of basic vocabulary; the basic communication about personal topics (self and others); identification and description of Spanish speaking countries; the design of written products in the TL; expressing existence, preferences and agreement; talk about daily habits
- ICHL 183 Spanish III for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 182 Spanish II for Hospitality and Tourism Industry  
 Towns, quarters and cities; directions; past experience; present perfect tense, past tense indefinido; verbs ser, estar and hay; vocabulary of places; time markers for past tense; verbs empezar a+ infinitive; verbs ir / irse
- ICHL 184 Spanish IV for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 183 Spanish III for Hospitality and Tourism Industry  
 Habits; pronominal verbs; porque/para; house; furniture and parts of the house; appearance; family, irregular verbs in present tense; present progressive
- ICHL 185 Spanish V for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 184 Spanish IV for Hospitality and Tourism Industry  
 Leisure activities; intentions and projects; pain, discomfort and symptoms; parts of the body; vocabulary of food; ir a+ infinitive; present perfect; differences between ser and estar; personal pronouns for objects; verb gustar
- ICHL 186 Spanish VI for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICHL 185 Spanish V for Hospitality and Tourism Industry  
 Past habits, customs and circumstances, past and present action, advice, instructions (imperative), future; situations and actions, conditions, hypotheses, past experience; verb tense imperfect; verb tense indefinido; verb tense present perfect; contrast of past tenses.
- ICHL 187 Spanish VII for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisite(s):** Placement test or ICHL 186 Spanish VI for Hospitality and Tourism Industry  
 Expressing past and present habits; expressing obligation, prohibition and impersonality; talking by phone, expressing direct and indirect speech; pronouns direct and indirect object; vocabulary of professions, television programmes and cinema.
- ICHL 188 Spanish VIII for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisite(s):** Placement test or ICHL 187 Spanish VII for Hospitality and Tourism Industry  
 Expressing desire, complaint and necessity; telling anecdotes; expressing cause and effect; expressing interests and feelings; Present Subjective; talking about personal relationships; disagreeing in a formal and informal situation; easing a disagreement; describing specifications and how something works.
- ICHL 189 Spanish IX for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisite(s):** Placement test or ICHL 188 Spanish VIII for Hospitality and Tourism Industry  
 Making hypotheses and conjectures; relating mysterious incidents; writing a news article; referring to a news article and commenting about it; giving advice; evoking imaginary situations; expressing an opinion about actions and behaviours; expressing opinions and desires; narrating events in the past; Future Tense; uses of Present Subjective; Past Tenses; Passive Voice; vocabulary mass media.



- ICHL 190 Spanish X for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisite(s):** Placement test or ICHL 189 Spanish IX for Hospitality and Tourism Industry  
 An analysis of texts of various kinds (press, advertisements, literature, reports, etc.) chosen according to the fields and topics of interest of the students and production of similar written documents, in order to prepare the students for the written skill part of a standard intermediate level proficiency test.
- ICHL 191 Spanish XI for Hospitality and Tourism Industry** **4 (4-0-8)**  
**Prerequisite(s):** Placement test or ICHL 190 Spanish X for Hospitality and Tourism Industry  
 An analysis of various audio documents (such as TV and radio broadcast, plays and films) chosen according to the fields and topics of interest of the students and the production of similar documents, in order to prepare the students for the oral skill part of a standard intermediate level proficiency test.
- ICHM 101 Introduction to Philosophy** **4 (4-0-8)**  
**Prerequisites:** -  
 Fundamental philosophical methods and leading philosophical ideas concerning the notions of reality ('metaphysics'), knowledge ('epistemology'), consciousness ('philosophy of mind') and freedom ('action theory' / 'ethics'); reading of paradigmatic texts, both traditional and contemporary, and analysis as well as comparison of philosophical arguments; discussion of modern scientific research results in relationship to topics traditionally considered philosophical.
- ICHM 103 Introduction to Logic** **4 (4-0-8)**  
**Prerequisites:** -  
 Introduction to methods of symbolic deductive logic (natural deduction, transformation tasks and logical analysis with regard to English) and to basic concepts characterizing modern logical theories; propositional logic; syllogistic reasoning and basic predicate logic.
- ICHM 105 Music Appreciation** **4 (4-0-8)**  
**Prerequisites:** -  
 Introduction to distinctive features of Western classical music with paradigmatic examples; an elementary outline of music history, musical styles and idioms; exploration of musical form and structure as an essential but dynamic constituent of aesthetic expression; analysis and interpretation of basic musical patterns for the development of musical awareness and listening skills.
- ICHM 106 Moral and Ethical Studies** **4 (4-0-8)**  
**Prerequisites:** -  
 Introduction to diverse ethical theories and paradigms (Virtue Ethics, Utilitarianism, Deontology, Naturalism, Intuitionism) in both historic and systematic terms. Outline of metaethics and formal ethics, multicultural approaches to ethics as well as psychological moral constraints (Situationism). Discussion of ethical reasoning with regard to contemporary ethical issues (human and animal rights, sexuality, environmental pollution, abortion, death penalty and euthanasia).
- ICHM 107 Introduction to Asian Philosophy** **4 (4-0-8)**  
**Prerequisites:** -  
 Main aspects of Asian philosophy, covering the key philosophical ideas in India, starting from the Indian philosophy during the Rgvedic period, Buddhist philosophy and other main Hindu philosophical ideas developed during and after the Buddha's lifetime.
- ICHM 140 Elementary Art Theory** **4 (4-0-8)**  
**Prerequisites:** -  
 Art theory in both analytical and historical terms including the relationship between art and technology; exploration of major concepts in Aesthetics and Semiotics and analysis of diverse art forms as well as individual art pieces.
- ICHM 143 Introduction to Photography** **4 (2-4-6)**  
**Prerequisites:** -  
 Basic skills and aesthetic principles of photography, how the camera works, types of cameras and film, techniques in taking pictures, specialized forms of photography, developing film, the aesthetics of picture taking.

- ICHM 202 Intermediate Logic** 4 (4-0-8)  
**Prerequisites:** -  
Monadic and polyadic first-order Predicate Logic in formal deduction and both natural language translation and argumentation; introduction to basic elements of logical semantics, metalogical concepts and aspects of non-classical Logic.
- ICHM 205 Politics and Ethics** 4 (4-0-8)  
**Prerequisites:** -  
Ideas of political philosophy based on some classical text and contemporary approaches. Focusing on general questions of ethics through the lens of justice. Discussion of ethical questions regarding how persons ought to be governed/or if they ought to be governed at all (the justification of the authority of the state), the relationship of freedom and autonomy, and exploring the nature of a fair state, a good ruler and a just international order. Concepts learned will be tested in light of current political, ecological and economic issues.
- ICHM 206 Ethics and Technology** 4 (4-0-8)  
**Prerequisites:** -  
Traditional and non-traditional ethical theories and their application to issues in modern technology topics.
- ICHM 212 The Enlightenment in European Literature** 4 (4-0-8)  
**Prerequisites:** -  
The 18th century formative period in Europe through literary texts; political justice, religious tolerance, freedom of expression, individual freedom, the role of women in society and the perception of non-Western cultures in order to understand the meaning of the Enlightenment and of Immanuel Kant's principal motto of enlightenment, 'Sapere aude!', 'Dare to know!'. The literature selected ranges from classical drama to satirical, adventurous and amorous novels.
- ICHM 213 Elements of Knowledge Representation** 4 (4-0-8)  
**Prerequisites:** -  
Knowledge representation from a logical, semiotic and philosophical perspective with focus on systematic conceptual accounts of the world (ontology) and non-monotonic (common sense) reasoning; presentation of selected tools and basic frameworks discussed in AI related research into rational agents without specifically targeting programming and efficient computing.
- ICHM 218 Film Studies** 4 (4-0-8)  
**Prerequisites:** -  
Picture track and sound track components of a movie and of the principles behind their organization in order to develop student analytic skills and capacity to watch films from a new and enriching point of view; examples chosen from films made in the United States, Europe and Asia.
- ICHM 223 Thai Arts** 4 (4-0-8)  
**Prerequisites:** -  
Thai art forms including painting, sculpture, and architecture found in Thailand from pre-historic to modern periods; influence of other cultures on Thai arts.
- ICHM 225 The Western Classical Ideal** 4 (4-0-8)  
**Prerequisites:** -  
The 5th century Athens in the famous classical age of ancient Greece which witnessed the rise of Western style democracy, arts, science, philosophy, and literature; history of the period as well as its important architectural and artistic remains; readings from Plato, Aeschylus, and Aristophanes; ancient Greek mythology sciences and philosophies that came to characterize what is known as "the Age of the Greek Enlightenment".



- ICHM 241 Introduction to Drawing** **4 (2-4-6)**  
**Prerequisites:** -  
 Different aspects of drawing, observation and analysis of structure, form, proportion and contours, gaining a deeper understanding of visual perceptions; the development and practice of basic skills of realistic pencil drawing.
- ICHM 242 Intermediate Drawing** **4 (2-4-6)**  
**Prerequisites:** -  
 Application and practice of drawing skills with models with more complex structure and shading, new techniques of drawing and new media/drawing tools, practicing to develop more sensitivity to the visual (with finer details), knowing one's own personal artistic preferences and developing some personal style in drawing.
- ICID 100 Freshman Seminar** **0 (1-0-0)**  
**Prerequisites:** -  
 Compulsory for all freshmen; time management skills, study plan, adjustment to college's life, and teachers' expectation
- ICIR 101 Approaches to International Relations and Global Affairs** **4 (4-0-8)**  
**Prerequisites:** -  
 The principles and practice of international relations, with particular reference to the modern world; the bases of international power and interstate competition; inequalities among states, including domination and colonialism; war and conflict resolution among great powers; the role of trade, defence policies, and control over scarce resources; the involvement of non-state players, including international organizations and special interest groups; international issues concerning the treatment of minority groups, human rights, the use of the environment, international crime, and terrorism. Students will learn to discuss, analyze, assess, international structures, methods, interactions of actors in international politics
- ICIR 102 Approaches to Comparative Politics and Systems** **4 (4-0-8)**  
**Prerequisites:** -  
 Various forms of political systems, both in theory, principle, and practice; political systems in stateless societies, traditional kingdoms and empires, absolutist states, democracies, and modern "authoritarian" and militaristic states; various forms of representation, the party-political systems, elections, and decision-making; the working of the executive, legislative, and judicial aspects of government and their interrelationships. Students will understand, examine, assess various forms of the political systems, both in theory, principle and practice
- ICIR 201 The Formation of the Modern World: From the Industrial Revolution to High Imperialism** **4 (4-0-8)**  
**Prerequisites:** -  
 Selected aspects of world history from c.1763 to 1914; the Industrial Revolutions and the growth of the world economy; the American and French Revolutions; Latin American independence and development; political developments in Europe and the United States: representative government, the abolition of slavery, nationalism, socialism, women's rights; imperialism and responses to it; the emergence of Japan; wars and warfare; social, scientific, medical and technological development; students will discuss, assess, examine a range of primary sources from the period and develop skills in the critical analysis of texts and images
- ICIR 202 Globalization and the International Order in the Twentieth Century:** **4 (4-0-8)**  
**From the First World War to 9/11**  
**Prerequisites:** ICIR 201 The Formation of the Modern World: From the Industrial Revolution to High Imperialism  
 A short introduction to selected aspects of world history since World War II; the USA and the USSR as superpowers; the Cold War; the UN system; decolonialization and the 'Third World'; major regional powers; the Soviet collapse and its repercussions; regional conflicts in the Middle East, South Asia, and the Balkans; economic, technological and scientific developments; the great consumer boom; OPEC and oil prices; the World Bank and IMF; the EU and other economic regionalisms; world poverty; new political movements: Civil Rights, feminism, radical Islam; Ethnic conflicts and nationalism; students discussing, examining, assessing, identifying, changes over time and interpreting primary sources, introduced in ICIR 201 The Formation of the Modern World

- ICIR 203 Foundations of Political Thought** **4 (4-0-8)**  
**Prerequisites:** -  
 A historical survey of the major paradigms in the social sciences (history, political science, economics, sociology, anthropology, geography, psychology) during the twentieth century; students will understand, analyze, assess concepts and paradigms of political thought
- ICIR 204 Perspectives on International Relations** **4 (4-0-8)**  
**Prerequisites:** -  
 Theories of international relations; sovereignty; globalization and change; security; realism; anarchism; liberalism; neoliberal institutionalism; Marxism; constructivism; post-structuralism; students will identify, compare, and evaluate critical approaches to international relations.
- ICIR 211 Globalization and Social Change** **4 (4-0-8)**  
**Prerequisites:** -  
 The global structures and transformations of the late twentieth century; the global economy, food supply, population, disease, environment, resources, and pollution; communications; geopolitics, national states, regional, and international organizations; minorities; the role of women; warfare and terrorism; migration and refugees, crime, culture; students will understand, analyze and assess global structures and transformations in the world
- ICIR 212 Social Institutions of the Modern World** **4 (4-0-8)**  
**Prerequisites:** -  
 Basic social institutions in comparative global perspective; socialization, marriage and the family education and knowledge; religion and culture; media and communication; government and administration; politics and power; multi-institutional politics approaches in sociology; students will describe, explain, and analyze significant social and political institutions
- ICIR 213 Conflict, War and Peace Studies** **4 (4-0-8)**  
**Prerequisites:** -  
 The impact of war upon society and the state; social and political consequences of war; the mobilization of society in times of war; the status of human rights and freedom in times and places of war, politics and war; patterns of military organization, the possible social and political role of the military; students will describe, explain, analyze, and assess major approaches to conflict, war and peace in comparative global perspectives
- ICIR 214 Perspectives on Thailand** **4 (4-0-8)**  
**Prerequisites:** -  
 Traditional Thai culture, social structure and hierarchy; interpersonal relations; krong jai; family; the role of Buddhism and animism; folk traditions (birth, life, marriage, death, etc.); the modern period; the impact of Chinese, Western and Japanese culture; business culture; the rural-urban division; students will describe, explain, analyze, and assess major approaches to perspectives on Thailand in international relations
- ICIR 215 Thai Foreign Policy** **4 (4-0-8)**  
**Prerequisites:** -  
 The influence of geopolitics on Thailand's foreign policy; pre-modern interstate relations and concepts in Southeast Asia and their continuing influence; Siam's relations with the Western imperial powers in the Colonial Period; the evolution of Thailand's foreign policy and relations during the First and Second World Wars; Thailand's foreign policy during the Cold War, especially its relations with the USA, the formulation and effects of current Thai policies regarding ASEAN, the UN, APEC, and other regional and international organisations; the evolution and impacts of current Thai bilateral relations with China, the Koreas, Japan, and India; students will discuss the formulation, evolution, and results of Thai foreign policy from the mid-nineteenth century to the present day; with a particular focus on analysing the decision-making process in a selected case study.

- ICIR 216 Religious Movements and Diversity in Asia** **4 (4-0-8)**  
**Prerequisites:** -  
 Religious diversity in Asia; types of religious movements and cults; genders and the changing religious traditions; students will understand, analyze, and assess the importance of religious movements and diversity in Asia with the help of selected case studies
- ICIR 221 International Political Economy** **4 (4-0-8)**  
**Prerequisites:** -  
 The historical development of a world political society and the structures of international diplomacy; war and peace-making between the Great Powers; The Concert of Europe; The League of Nations; the United Nations and the Cold War; International agreements, treaties, and organizations; the principles of international law and the international political economy; students will remember, understand, apply, and analyze the historical development towards a peaceful world order
- ICIR 222 International Organizations** **4 (4-0-8)**  
**Prerequisites:** -  
 The development of international organizations since the 19th century; their nature, function, and purpose; contemporary global and regional international organizations (the United Nations, ILO, WTO, and the IMF; the EU, ASEAN, NAFTA, APEC, etc.); their effectiveness and future. Students will remember; understand; analyze; assess organizations from a comparative perspective
- ICIR 223 Democracy as a Political System** **4 (4-0-8)**  
**Prerequisites:** -  
 Historical developments; the principles, practices, and processes of democracy; essential elements; criticisms, strengths, and weaknesses; alternative systems; social and cultural prerequisites for democracy; possible future developments; students will understand, analyze, and assess the historical development, principles and practices of democracy
- ICIR 224 Security and Conflict in a Global Perspective** **4 (4-0-8)**  
**Prerequisites:** -  
 Recent developments of warfare with particular reference to the contemporary world; the development of armed forces and innovations in weaponry, tactics and strategy; social and economic costs of warfare; combat and combatants; provisioning and planning; the use of reporting and propaganda in support of warfare; the industrialization of war and the rise of "New Wars"; types of warfare and security challenges in the contemporary world; students will understand, analyze, and examine why some methods of conflict resolution are more effective than others
- ICIR 225 Global Media, Social Change and International Relations** **4 (4-0-8)**  
**Prerequisites:** -  
 The development of the media as a global socializing force; the creation of a global market place; the information age; the power of the media in society and politics; the new global media culture; students will understand, analyze, and assess the importance of global opinions and discursive politics in shaping debates and policies
- ICIR 226 The History and Concept of Diplomacy** **4 (4-0-8)**  
**Prerequisites:** -  
 The uses of diplomacy and negotiation in resolving political and commercial disputes; the role and status of diplomats and negotiators; the question of political versus commercial issues; state-to-state relations; business-to-state relations; international business-state relations; conflict generation and diplomatic model solutions; students will remember, understand, analyze, and assess the conceptual foundations in understanding diplomacy
- ICIR 227 Approaches to Culture and Society** **4 (4-0-8)**  
**Prerequisites:** -  
 Culture in the modern world; the study of symbol; how culture is defined and created; modernity, post-modernity, and techno-culture; dominant and minority cultural forms; gender, sexuality and ethnicity; globalism and post colonialism; the culture of everyday life; students will describe, explain, and analyze approaches to culture and society

- ICIR 228 Europe and the 'West' in the Contemporary World** 4 (4-0-8)  
**Prerequisites:** -  
The current situation in Europe; economic developments and trend; the growth and strength of the EU; the relations between Eastern and Western Europe; ethnicity, separatism, and conflict in Western Europe and the Balkans; Cyprus and the relationship between Greece and Turkey; immigration; Brexit; students will understand, analyze, and assess the contemporary situation and issues in Europe
- ICIR 229 Environment and Natural Resources in Global Affairs** 4 (4-0-8)  
**Prerequisites:** -  
The availability, distribution and uses of the world's resources: food, water, land, soil, minerals, energy, fisheries, etc; resource depletion and optimal usage; public policies, international agreements and business needs as related to the production, distribution and exchange of resources; relevant technological and scientific developments; future prospects; students will understand, analyse, and assess the environment and its impact on international relations
- ICIR 231 Imperial Legacies in Asia** 4 (4-0-8)  
**Prerequisites:** -  
A concise history of the region from the beginning of the modern colonial period through to independence; liberalism, nationalism, communism, democratization and globalization; students will understand, assess, and analyse both primary and secondary sources related to imperialism in Asia
- ICIR 232 Tradition and Modernity Asia** 4 (4-0-8)  
**Prerequisites:** -  
The meanings of tradition, modernity, living space, identity, nation-building, modernization, in the Asian context; students will discuss, assess, understand, and analyze a range of topics such as the family, religion, identity politics and urbanism
- ICIR 233 Identity Politics and Social Movements in Asia** 4 (4-0-8)  
**Prerequisites:** -  
Political movements and the ideas that inspired them; paradigm shifts in the political systems, Enlightenment, Liberalism, Neo-liberalism, Conservatism, Neo-conservatism, Fascism, Democracy, Anarchism, Constructivism, Liberation theology, Labor movements, Civil Rights; Peace and anti-war movements; People power; Non-violent civil disobedience in Asia; students will analyze; assess; and examine variety of case studies from selected countries in Asia from a comparative perspective
- ICIR 234 Perspectives on South Asia** 4 (4-0-8)  
**Prerequisites:** -  
The rise and fall of the Mughal Empire; Hindus, Muslims, and Sikhs; the rise of European influence; the British raj; social and economic transformations; movements of religious reform and protest; the independence movement; economic and political developments since 1947; students will understand, analyze, and assess the importance of the Indian Sub-Continent in the world
- ICIR 235 Strategic Networks in Asia-Pacific** 4 (4-0-8)  
**Prerequisites:** -  
An overview of the contemporary East Asian scene based on comparative politics and international relations theory; issues of territorial conflicts; cross straits relations; North-Korea/Six Party talks and East Asian Security architecture; economic models and limits of the developmental state; social issues (demographics, youth, old people); environmental issues; and the state of democracy/democratization in East Asia and the Asia-Pacific; students will understand, assess, and analyze historical and contemporary issues of significance in the Asia-Pacific region

**ICIR 236 Europe Since 1945****4 (4-0-8)****Prerequisites: -**

A political and economic history of Europe since 1945; devastation of World War II; the Marshall Aid and the economic recovery; the impact of the Cold War; early development of the European Economic Community; foreign policies of Britain, France, and Germany; loss of empire; Internal political, social and economic developments in the major European countries; Immigration; the situation in Eastern Europe; the collapse of communism and its consequences; the European Union; the contemporary situation and future prospects; students will describe, analyze, assess, and explain themes in post- World War 2 Europe

**ICIR 301 Research Methods****4 (4-0-8)****Prerequisites: -**

An introduction to the scientific method and its use in social science research; an examination of research methods, data collection, survey techniques, and hypothesis formation and testing; students will assess, analyze the, evaluate world events; disciplinary research methods in international relations

**ICIR 302 ASEAN and Southeast Asian Regionalism****4 (4-0-8)****Prerequisites: -**

Southeast Asia in the context of global politics in the period since World War II; the impact of the Cold War and its ending; the international relations of the Southeast Asian states; ASEAN; students will assess, analyze the, evaluate ASEAN regionalism

**ICIR 303 Transnational Movements and Migration****4 (4-0-8)****Prerequisites: -**

The development of organized labour following the Industrial Revolution; social changes induced by industrialism; factory conditions and reform; early labour movement; consolidation of trade unionism in Britain; labour and union movements in Continental Europe; labour movements in the USA and the British Dominions up to World War I and II; labour movements worldwide from 1914 to the present day; issues of the trade union organization, power and influence in the modern world and migration; students will understand, analyze, examine, and evaluate the movement and migration of people globally; impacts and responses of international organizations and states

**ICIR 304 Transnational Crime****4 (4-0-8)****Prerequisites: -**

The scope of transnational crime; international agencies and institutions involved in interdiction efforts; interdiction procedures and jurisdictions; controlling smuggling and piracy; investigation of international financial crimes such as fraud, tax evasion and money laundering; human trafficking networks; the international drug trade; intellectual property rights regimes and violations; cyber-crime; terrorism; crimes against humanity; students will understand, examine, and evaluate the networks and effects of transnational criminal networks; responses by state and non-state actors

**ICIR 305 Conflict Resolution****4 (4-0-8)****Prerequisites: -**

Origins and methods of conflict resolution; typologies and historical trends of conflict and violence; conflict prevention and containment; negotiation and international agreements; cessation of hostilities and durable standards for the implementation of conflict settlements; terrorism, justice, and the rule of law; modern warfare dynamics and ways to counter internecine conflict cycles; students will analyze, examine, and critically assess why some methods of conflict resolution are more effective than others

**ICIR 311 Foreign Policy Analysis****4 (4-0-8)****Prerequisites: -**

The foreign policy of the United States; the Soviet Union; Russia and China other powers since 1945; objectives and realities; relations between these powers; the foreign policy role played by the Western European powers, Japan and India; students will analyze, assess, and evaluate comparative foreign policies

**ICIR 312 International Law and International Relations**
**4 (4-0-8)**
**Prerequisites: -**

The nature, development, and current status of international law; the legal personality of states and other entities under the international law; recognition; territory; jurisdiction and immunity; treaties; state responsibilities; the settlement of disputes and the use of force; laws of the sea, air and space; environmental law; human rights; international legal institutions; enforcement of international law; students will understand, analyze, and evaluate; the key concepts of international law in an international relations context

**ICIR 313 Human Rights and International Relations**
**4 (4-0-8)**
**Prerequisites: -**

The concept of human rights in philosophical, historical, and legal perspective; human rights in contemporary international law; international conventions and the United Nations; individual rights; war crimes; the protection of minorities; economic, and cultural rights; students will understand, analyze, and evaluate human rights from an interdisciplinary perspective

**ICIR 314 International Development Studies**
**4 (4-0-8)**
**Prerequisites: -**

Concepts of political and economic development; policies, structures and patterns of change; production and investment priorities; the consequences of economic transformation in poor countries; contrasting results in Asia, Africa, and Latin America; urbanization and urban-rural relations; social and economic stratification; problems and challenges relating to commerce, travel and the communication revolutions; students will be able to discuss, analyze, and evaluate international development and its impacts

**ICIR 315 Devolution, Privatization and State Failure**
**4 (4-0-8)**
**Prerequisites: -**

A critical examination of the factors leading to the devolution and decentralization in government; the popularity of local autonomy and regionalism in politics; the parallel trend of de-regulation and privatization in business and government; re-defining the role of national and central governments and their responsibilities to citizens; autonomy and regionalism; students will discuss, and evaluate the effects of neoliberalism; its relationship to state failure; changing trends in international relations

**ICIR 321 Political Risk, Business and International Relations**
**4 (4-0-8)**
**Prerequisites: -**

How political power, interests, values, local culture, systems, technology create risks for international business; political risk in developed countries; implications for non-western companies overseas; students will analyze, assess, and evaluate how to anticipate; manage; mitigate political risks

**ICIR 322 The Politics and Economics of Non-Governmental Organizations**
**4 (4-0-8)**
**Prerequisites: -**

The history and development of Non-Governmental Organizations at the national and international levels, the identification of social issues: slavery, women's and minority rights, civilians and the injured in wartime, refugees, civil rights, environmental issues, global political and economic movements;

the relation of NGOs with the state and international organizations; the politics, organization and finance of NGOs; NGOs in relationship with business; students will analyze, assess, and evaluate the role of NGOs in international affairs

**ICIR 323 The Practice of Diplomacy**
**4 (4-0-8)**
**Prerequisites - ICIR 226 History and Concept of Diplomacy**

The uses of diplomacy; negotiation; conflict resolution; political and commercial disputes; describing the role; function; methods of diplomats and negotiators in international relationships; students will develop, understand, assess, evaluate, and practice methods to identify problems and develop innovative solutions

- ICIR 324 Society and Technology in the Modern World** 4 (4-0-8)  
**Prerequisites:** -  
The social impact of science and technology up to c. 1900; the early 20th century: transportation, the technology of warfare, the 'New Physics' of Einstein and Bohr; developments since World War II; computers; satellite communications; the Internet; genetic engineering; and medical advances; students will analyze, assess, and evaluate impacts of new media in international affairs
- ICIR 325 Migration, Diasporas and the Politics of Space** 4 (4-0-8)  
**Prerequisites:** -  
Reasons; contexts of migration historically; preservation; transformations of traditional cultures and identities in alien land. Enclave communities and host societies; generational differences in culture amongst migrants. The image of homeland; students will examine, assess, and evaluate the cultural impact of the movement of peoples
- ICIR 326 Contemporary China: Global, Regional, and Local Perspectives** 4 (4-0-8)  
**Prerequisites:** -  
Contemporary politics, economy, society and culture in the People's Republic of China, Hong Kong and Taiwan; international relations in a Chinese perspective; students will assess, analyze, and evaluate China's impact on the region and world
- ICIR 327 Ethnicity and Representation in International Affairs** 4 (4-0-8)  
**Prerequisites:** -  
The concept of ethnicity; ethnic labeling and identity; the concept of race; minority groups, wider society, and the state; acceptance, prejudice and discrimination; economic, political, and socio-cultural aspects of ethnicity; ethnic conflicts; ethnic cleansing and genocide; students will explain, discuss, and evaluate the relationship of ethnicity; the state; in international affairs
- ICIR 331 Religion and Politics in the Contemporary World** 4 (4-0-8)  
**Prerequisites:** -  
Religion and society; types of religious organizations and movements and their social role and impact; secularization and counter-secularization; religion; politics; and the state; students will examine, analyze, and evaluate; case studies the contemporary role of religion in selected societies
- ICIR 332 Comparative Regionalism** 4 (4-0-8)  
**Prerequisites:** -  
To discuss, interpret, analyze, evaluate regionalism theoretical viewpoints; students will examine, understand, analyze, and evaluate major regional organizations, foundations, purposes, functions, institutional designs, methods of interaction in a global perspective
- ICIR 333 Politics of Memory in Asia** 4 (4-0-8)  
**Prerequisites:** -  
Ethnicity in relationship with language, religion, 'race', and culture; ethnic groups in Southeast Asia; minorities and majorities in the various Southeast Asian states; political and cultural issues; the development of national identity; students will assess, analyze, and examine, memory; ethnic groups; minorities in Asia
- ICIR 334 Terrorism, Counterterrorism and Political Violence** 4 (4-0-8)  
**Prerequisites:** -  
A brief historical survey of terrorism; theories of terrorism; a critical examination of political theory regarding the rights and wrongs of revolt and terrorism; the relationship of the modern state with terrorism and societies; students will be able to understand, analyze, and evaluate terrorism in the contemporary world

- ICIR 341 Current Issues in International Relations and Global Affairs** 4 (4-0-8)  
**Prerequisites:** -  
 Selected topics of contemporary relevance for International Relations and Global Affairs; students will examine, analyze, and evaluate; synthesize case studies to appraise; interpret; recent developments in World politics
- ICIR 342 Current Issues in Asia** 4 (4-0-8)  
**Prerequisites:** -  
 Selected topics of contemporary relevance for International Relations and Global Affairs; students will examine, analyze, evaluate, and synthesize case studies to appraise; interpret; recent developments in World and Asian politics
- ICIR 343 The Creative Job Search** 4 (4-0-8)  
**Prerequisites:** -  
 How to find a job, create a CV, personal branding; prepare, perform effectively for interviews; explains how to evaluate the application experience; students will assess, arrange, and appraise methods and means to find jobs in a competitive marketplace.
- ICIR 401 Internship** 12 (0-36-12)  
**Prerequisites: Have completed all International Relations and Global Affairs program courses lower than 400 level**  
 An internship to increase practical experiences relevant to students' concentration in working at various organizations such as non-governmental organizations, international organizations, research organizations, educational organizations, or private organizations.
- ICIR 402 Senior Thesis** 12 (0-0-68)  
**Prerequisites: Have completed all International Relations and Global Affairs program courses lower than 400 level**  
 The opportunity; of carrying out empirical research projects under the close supervision.; to demonstrate initiative, creativity, systematic problem-solving, persistence, attention to detail; students will prepare a thesis proposal in consultation with their prospective supervisor; students will evaluate, analyze, and create a unique contribution to an academic discipline of their choosing under the lecturer's supervision
- ICLC 211 Pre-intermediate Chinese I** 4 (4-0-8)  
**Prerequisites: ICML 133**  
 Read and summarize passages, write letters, relate travel experience, describe one's appearance, the preposition "ba". (The preposition "ba" and its object which together function as an adverbial clause in sentences with verbs being the predicate.), express the continuation of an act, complement of direction, describe the degree level of state of things as they change over time, Chinese culture on weddings.
- ICLC 212 Pre-intermediate Chinese II** 4 (4-0-8)  
**Prerequisites: ICLC 211**  
 Express one's feelings. i.e. sadness, happiness, anger, pain, etc., relate someone's experience and evaluate behavior, the preposition "ba" (continued), express passive meaning by using the prepositions "bei", "jiao", "rang", complement of potentiality (I), reduplication of numeral-quantifier compounds, Chinese culture and custom on how to decorate a house.
- ICLC 213 Pre-intermediate Chinese III** 4 (4-0-8)  
**Prerequisites: ICLC 212**  
 Make and decline invitations and requests, to express agreements and disagreements, express one's wishes, and indicate the result of an act using complements of direction, the flexible use of interrogative pronouns, rhetorical questions to express affirmation or negation, complement of potentiality (II), Chinese idioms and proverbs.



- ICLC 311 Intermediate Chinese I** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICLC 213  
 Elements of intermediate grammar and vocabulary related to specialized contexts allowing the students to participate in discussions on specific topics, express opinions and ask for clarification in such contexts, read a wider variety of long texts, and write extended letters or narratives. Asking and giving advice, words of consolation, writing about travelling, expression of assumption, Chinese idioms, express feeling of sorrow and grievance, rules and regulations for entering China, the belief of good and bad luck, Chinese traditional style house (Siheyuan), Peking Opera; existence emergence sentence, indirect refusal of a request, reduplication adjective used as an adverbial; conjunctions
- ICLC 312 Intermediate Chinese II** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICLC 311  
 More advanced grammar and vocabulary related to a wider variety of specialized contexts allowing the students to begin, hold and close extended conversations and discussions related to specialized topics and situation, and read and write simple argumentative texts related to such contexts.  
 Chinese proverbs (1), idioms and expressions (1), poems (1), making a comparison, tourist attractions in China, Chinese dialects, Qingming festival, three Gorges of the Yangtze river 被 (bei) sentence, the complement of potentiality, prepositions, auxiliary verbs, continuity of an act, adverbs
- ICLC 313 Intermediate Chinese III** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICLC 312  
 Consolidation of the acquisitions of ICLC 311 and 312 and further mastering of advanced grammar and specialized vocabulary in order to allow the students to fully reach a standard intermediate level of proficiency. Give warnings, note taking, memo writing, indication of unexpected situation with a tone exclamation, Chinese proverbs (2), idioms and expressions (2), poems (2), midautumn festival, summer activities for the young people in China, recent developments in Chinese families; adverbs, phrases, conjunctions, auxiliary verbs.
- ICLC 340 Chinese for Business** **4 (4-0-8)**  
**Prerequisites:** ICLC 313  
 The Chinese for Business course emphasizes discourse in business settings/situations such as conversations with people in a business context, dialogues at a reception, presenting companies/products/services, talking about organizational structure, and communicating with superiors and coworkers.
- ICLF 211 Pre-intermediate French I** **4 (4-0-8)**  
**Prerequisites:** ICML 123  
 To talk about friends; to describe someone; to look for a job; to apply for a job; to give advice; to talk about professional activities and professional experiences; to report speeches (1); relative pronouns : qui, que, à qui; Imparfait and passé composé tenses; subjunctive mood to express necessity.
- ICLF 212 Pre-intermediate French II** **4 (4-0-8)**  
**Prerequisites:** ICLF 211  
 To talk about a country; to understand tourist information and to make a reservation. To talk about one's living environment; to justify a choice; to talk about a movie; relative pronouns: où, dont ; Pronouns en & y; Gerundive form. Past tenses review: imparfait / passé composé / plus-queparfait; passive voice (1).
- ICLF 213 Pre-intermediate French III** **4 (4-0-8)**  
**Prerequisites:** ICLF 212  
 To express wishes; to make a suggestion; to talk about a project; to talk about a book or an article; to express aims, causes and consequences; to express agreements and disagreements; to talk about changes in life; to express a regret; subjunctive mood to express wishes; conditional mood to make a suggestion; reported speeches and time accordance; past conditional to express past hypothesis and regret.

**ICLF 311 Intermediate French I****4 (4-0-8)****Prerequisites: Placement test or ICLF 213**

To talk about one's own image and look, to ask information & advice by e-mail; to describe people and their behaviors; to speak highly of someone; to do suggestion and reproach; to express feelings (2); to give advice and order; to talk about consumption; to write a claim by e-mail; to negotiate a price; to complain about a service; to report a third person's speech and, to warn someone.

**ICLF 312 Intermediate French II****4 (4-0-8)****Prerequisites: Placement test or ICLF 311**

More advanced grammar and vocabulary related to a wider variety of specialized contexts allowing the students to begin, hold and close extended conversations and discussions related to specialized topics and situation, and read and write simple argumentative texts related to such contexts. To talk about one's own image and look, to ask information & advice by e-mail; to describe people and their behaviors; to speak highly of someone; to do suggestion and reproach; to express feelings (2); to give advice and order; to talk about consumption; to write a claim by e-mail; to negotiate a price; to complain about a service; to report a third person's speech and, to warn someone.

**ICLF 313 Intermediate French III****4 (4-0-8)****Prerequisites: Placement test or ICLF 312**

Consolidation of the acquisitions of ICLF 311 and 312 and further mastering of advanced grammar and specialized vocabulary in order to allow the students to fully reach a standard intermediate level of proficiency. To talk about studies and learning tools; to talk about one's experience in a curriculum vitae; to talk about the past; to concede and to oppose in an argumentative speech (1); to talk about the press: newspapers and magazines, to talk about an event in an article; to give information by letter or mail; to understand and introduce newspaper's articles; to express and to defend an opinion; to encourage and to promote solidarity; to ask detailed information by e-mail; to express aims and, to express duration with time indicators.

**ICLF 340 French for Business****4 (4-0-8)****Prerequisites: ICLF 313**

The French for Business course emphasizes discourse in business settings/situations such as conversations with people in a business context, dialogues at a reception, presenting companies/products/services, talking about organizational structure, and communicating with superiors and coworkers.

**ICLG 211 Pre-intermediate German I****4 (4-0-8)****Prerequisites: ICML 103**

Clothing and accessory, appearance, shopping for clothes and accessory family members, families in present and past, statistics, festivities and culture, dates, presents; comparative forms of adjectives, modal verbs past tense, dependent clauses (cause and condition), personal pronouns, accusative and dative case.

**ICLG 212 Pre-intermediate German II****4 (4-0-8)****Prerequisites: ICLG 211**

Housing II, furniture and equipment II, school and education, school system in Germany, future plans, appearance II, fashion and life style, description of persons; dependent clauses II, future tense, declination of adjectives.

**ICLG 213 Pre-intermediate German III****4 (4-0-8)****Prerequisites: ICLG 212**

Travel, weather and seasons, public transport; free time, learn to know people abroad, clubs, work and job search, job advertisement and application; impersonal verbs, modal verbs III, relative clauses, indefinite pronouns, phrasal verbs, dependent clauses (concessive).

**ICLG 311 Intermediate German I****4 (4-0-8)****Prerequisites:** Placement test or ICLG 213 Pre-intermediate German III

Media, statistics, habits in using media, argumentation about media, texts about media (reading and writing), politics, opinion about politics, wishes about politics, good and bad manners in different cultures, invitations in different cultures, rules of politeness, intercultural comparisons; Question words (summary), adjective suffixes and prefixes, adjective antonyms, past tense (regular and irregular), verbs with fixed prepositions, prepositions with dative, temporal dependent clauses.

**ICLG 312 Intermediate German II****4 (4-0-8)****Prerequisites:** ICLG 311 Intermediate German I

Describe people, ask for information on the telephone, describe advantages and disadvantages, reserve a room, complain, express praise, apply for a job on the phone, understand a travel brochure, talk about eating habits, understand tips for a healthy diet, order and pay in a restaurant, giving advice; prepositions with accusative (summary), indirect question phrases, indirect and direct questions, masculine nouns n-declinations, regular and irregular comparative forms, declination of articles, superlatives, and adjective endings, infinitive groups with zu, concessive dependent clauses, word formation: noun formation

**ICLG 313 Intermediate German III****4 (4-0-8)****Prerequisites:** ICLG 312 Intermediate German II

Understand texts about history, talk about occurrences in the past, talk about migration, express opinions on Europe, talk about relationships, express feelings, express opposites, resolve conflicts, define problems and express wishes, reporting an emergency, talk to a doctor, talk about health care jobs; past: past tense and present perfect, past perfect, temporal dependent clauses, conjunctions, dependent clauses with während as opposite, temporal dependent clauses with bis and bevor, word formation: character descriptions with verbs and shortened forms, relative clauses in nominative, accusative, and dative, relative pronouns: declinations, word formation: nouns.

**ICLG 340 German for Business****4 (4-0-8)****Prerequisites:**

The German for Business course emphasizes discourse in business settings/situations such as conversations with people in a business context, dialogues at a reception, presenting companies/products/services, talking about organizational structure, and communicating with superiors and coworkers.

**ICLJ 211 Pre-intermediate Japanese I****4 (4-0-8)****Prerequisites:** ICML 113

50 Kanji characters; expressing opinions, impressions, and expectations; reporting or quoting others' statements; describing and explaining people and things in details; giving directions; describing kind actions of other people using appropriate verbs; stating decisions, judgments, etc. based on the suppositions; asking for explanations, and explaining one's situations or reasons; asking for advices and instructions; expressing what one can or cannot do using potential verbs.

**ICLJ 212 Pre-intermediate Japanese II****4 (4-0-8)****Prerequisites:** ICLJ 211

50 Kanji characters; explaining state of things; describing necessary things to do in advance as preparations for the future; expressing own intentions, plans, and schedule; expressing own guess and inference; asking someone to take a message or conveying a message; stating standards or norms, when one explains the manner of doing a certain action or work; explaining a condition in which a certain action is performed; stating everyday habitual actions.

**ICLJ 213 Pre-intermediate Japanese III****4 (4-0-8)****Prerequisites:** Placement test or ICLJ 212

50 Kanji characters; expressing judgments under certain conditions; stating a purpose or an aim; describing changes in human ability and conditions; describing an action performed by a third person, or an action when one feels annoyed or troubled, using passive verbs; expressing something with the most important information emphasized; describing natural phenomena, happenings, and events, together with their causes; clearly telling what speakers consider as questions, by using a question with an interrogative as a component of a sentence; using appropriate expressions for giving and receiving of things and actions, depending on the relationship between the giver and the receiver, in terms of social status; telling usage, evaluation, necessary time, expense, etc.

- ICLJ 311 Intermediate Japanese I** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICLG 213  
 50 Kanji characters; Telling a supposition based on the appearance of a thing, person and scene; Expressing that the degree of an action or a state is excessive; Describing the easiness or difficulty in handling or doing something; Expressing feelings of surprise, disappointment or dissatisfaction when an expected consequence did not follow; Describing how to cope with a situation or its consequence under a hypothetical situation; Telling an action, stressing a certain point in time during the course of the action; Expressing that one is convinced and certain of what he/she states; Giving compulsion and permission; Seeking permission politely; Understanding Japanese view on relationship based on seniority, social status and insider/outsider relationships; Understanding the entire system of all respectful expressions and humble expressions.
- ICLJ 312 Intermediate Japanese II** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICLJ 311  
 50 Kanji characters; Explaining cultural aspects; Discussing about natural disaster; Comparing education systems; Understanding and presenting graphs and charts; Talking about health
- ICLJ 313 Intermediate Japanese III** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICLJ 312  
 50 Kanji characters; Report about invention, Discussion on issues related to natural environment, Understanding cultural differences, Discussion on social issues.
- ICLJ 340 Japanese for Business** **4 (4-0-8)**  
**Prerequisites:** ICLJ 313  
 The Japanese for Business course emphasizes discourse in business settings/situations communicating with superiors and co-workers such as asking permission, submitting proposal and making appointment and introduces the characteristics and unique aspects of Japanese business scene.
- ICLS 211 Pre-intermediate Spanish I** **4 (4-0-8)**  
**Prerequisites:** ICML 143  
 Habits; pronominal verbs; porque/para; house; furniture and parts of the house; appearance; family, irregular verbs in present tense; present progressive.
- ICLS 212 Pre-intermediate Spanish II** **4 (4-0-8)**  
**Prerequisites:** ICLS 211  
 Leisure activities; intentions and projects; pain, discomfort and symptoms; parts of the body; vocabulary of food; ir a+ infinitive; present perfect; differences between ser and estar; personal pronouns for objects; verb gustar.
- ICLS 213 Pre-intermediate Spanish III** **4 (4-0-8)**  
**Prerequisites:** ICLS 212  
 Past habits, customs and circumstances, past and present action, advice, instructions (imperative), future; situations and actions, conditions, hypotheses, past experience; verb tense imperfect; verb tense indefinido; verb tense present perfect; contrast of past tenses.
- ICLS 311 Intermediate Spanish I** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICLS 213  
 Express habits in present and past; express obligation, prohibition and impersonality; talk by phone, express direct and indirect speech; pronouns direct and indirect object; vocabulary of professions, TV programmes and cinema.
- ICLS 312 Intermediate Spanish II** **4 (4-0-8)**  
**Prerequisites:** Placement test or ICLS 311  
 Express desire, complaint and necessity; tell anecdotes; express cause and effect; express interests and feelings; Present Subjective; talk about personal relationships; disagree in a formal and informal situation; ease a disagreement; describe specifications and how something works.

<b>ICLS 313 Intermediate Spanish III</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> Placement test or ICLS 312	
Make hypotheses and conjectures; relate mysterious incidents; write a news article; refer to a news article and comment it; give advice; evoke imaginary situations; express an opinion about actions and behaviors; express opinions and desire; narrate events in the past; Future Tense; uses Present of Subjective; Past Tenses; Passive Voice; Vocabulary mass media.	
<b>ICLS 340 Spanish for Business</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICLS 313 Intermediate Spanish III	
The Spanish for Business course emphasizes discourse in a variety business context such as communicating with companies.	
<b>ICMA 100 Foundation Mathematics</b>	<b>0 (4-0-0)</b>
<b>Prerequisites:</b> Placement test	
Expressions and equations; linear functions; polynomials and nonlinear functions; radical and rational functions; the data analysis	
<b>ICMA 106 Calculus I</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> Placement test or ICME 100 Foundation Mathematics	
Brief review of trigonometry; limits and continuity; differentiation and its techniques; derivatives of algebraic and trigonometric functions; graph sketching; applications of the derivatives; antiderivative and integration; area under a curve and between curves.	
<b>ICMA 200 Principles and Mathematical Concepts</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Symbolic logic, proof techniques, sets, relations, functions, real number system, introduction to number theory.	
<b>ICMA 213 Calculus II</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 106 Calculus I	
Derivatives of logarithmic and exponential functions; techniques of integration; improper integrals and indeterminate forms; applications of the derivative and integration; infinite series; functions of several variables; limits and continuity; partial derivatives.	
<b>ICMA 214 Ordinary Differential Equations</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 106 Calculus I	
Introduction to ordinary differential equations, linear first order equations, nonlinear first order equations, applications of first order equations, second order linear equations, applications of second order linear equation, higher order linear equations	
<b>ICMA 216 Calculus IIIA</b>	<b>2 (2-0-4)</b>
<b>Prerequisite:</b> ICMA 213 Calculus II	
Vector, dot product, cross product, parametric equations, plane, surface in 3D, arclength, partial derivative, tangent plane	
<b>ICMA 217 Calculus IIIB</b>	<b>2 (2-0-4)</b>
<b>Prerequisite:</b> ICMA 213 Calculus II	
Lagrange multipliers, double integrals, triple integrals, line integrals, Green's theorem, surface integrals	
<b>ICMA 222 Introduction to Mathematical Software</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Introduction to the use of several software packages which are useful to mathematics students. Software for symbolic computing, software for numerical computing, software for mathematical documents, introduction to spreadsheets	
<b>ICMA 223 Linear Algebra A</b>	<b>2 (2-0-4)</b>
<b>Prerequisite:</b> -	
Linear equations, system of linear equations, matrices, Euclidean spaces, traces, determinants	

<b>ICMA 224 Linear Algebra B</b>	<b>2 (2-0-4)</b>
<b>Prerequisite:</b> -	
General vector spaces, linear transformations, eigenvalues and eigenvectors, Inner product spaces	
<b>ICMA 242 Discrete Mathematics</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Basic logic, set theory, relations, functions, integers, counting technique, algorithms, method of proof, Boolean algebra, topics from graph theory, tree, modeling computation	
<b>ICMA 151 Statistics for Science I</b>	<b>4 (4-0-8)</b>
<b>Prerequisite:</b> Placement test or ICMA 100 Foundation Mathematics	
Statistical ideas and concepts; probability, conditional probability; distribution functions; expected value; estimators, good estimators; hypothesis testing'	
<b>ICMA 252 Biological Statistics Laboratory</b>	<b>2 (0-4-2)</b>
<b>Prerequisite:</b> ICMA 151 Statistics for Science I	
Statistical softwares; probability; hypothesis testing; linear regression; non-parametric statistics	
<b>ICMA 253 Statistics for Science II</b>	<b>4 (4-0-8)</b>
<b>Prerequisite:</b> ICMA 151 Statistics for Science I	
Non-parametric statistics, categorical data analysis, simple linear regression, correlation, ANOVA	
<b>ICMA 322 Advanced Calculus</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Real and complex number systems; functions; continuity; convergence; differentiation; integration	
<b>ICMA 323 Partial Differential Equations</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Heat equation, method of separation of variables, Fourier series, wave equation, Laplace's equation	
<b>ICMA 335 Complex Variables</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Complex numbers, analytic functions; Cauchy-Riemann equations; conformality; Cauchy's Theorems, maximum modulus principle, Liouville's Theorem, Residue Theorem and evaluation of real integrals, principle of arguments, Rouche's Thorem	
<b>ICMA 338 Numerical Methods</b>	<b>4 (4-0-8)</b>
<b>Prerequisite:</b> ICCS 101 Introduction to Computer Programming, ICMA 106 Calculus I and ICMA 213 Calculus II	
Introduction to the use of computers to solve scientific problems, numerical solution of nonlinear equations, linear algebra systems, the interpolation and approximation of functions, differentiation and integration, and differential equations	
<b>ICMA 344 Time Series Analysis</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 151 Statistics for Science I	
Basic principles of representing time series in both the time and frequency domains; Box and Jenkins technique of fitting data to autoregressive moving average models in the time domain; model construction; evaluation and forecasting; analysis of time domain and digital filtering; methods of estimating and interpreting the spectrum	
<b>ICMA 346 Optimization</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 338 Numerical Methods or ICCS 205 Numerical Computation	
Introduction to the theory and algorithms of linear and nonlinear programming, linear programming, simplex method, duality theory and sensitivity analysis, large-scale linear programming, unconstrained nonlinear optimization, constrained optimization problems	

<b>ICMA 350 Probability</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 216 Calculus IIIA and ICMA 217 Calculus IIIB	
Sample spaces; basic axioms of probability; conditional probability and independence. Random variables, expectation and moment-generating functions, discrete and continuous distributions, multidimensional distributions and transformations, central limit theorem, sampling distribution theory	
<b>ICMA 353 Actuarial Mathematics I</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Stochastic approach to life insurance models using the life table and mathematics of finance; calculation of net premiums and reserves for life insurance; types of annuity products	
<b>ICMA 354 Actuarial Mathematics II</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 353 Actuarial Mathematics I	
Survival probability; joint life probabilities; last survivor and compound status functions; premiums; life insurance for other status; annuities; annuities paid after death	
<b>ICMA 393 Special Topics in Applied Mathematics I</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Topics of current interest	
<b>ICMA 395 Special Topics in Applied Mathematics II</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Topics of current interest	
<b>ICMA 424 Abstract Algebra</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Partitions and equivalence relations, binary operations, groups, subgroups, permutations, cyclic groups, isomorphism, direct products, cosets, normal subgroups, factor groups, homomorphism, rings, fields, integral domains	
<b>ICMA 432 Multivariate Analysis</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 151 Statistics for Science I	
Multivariate normal distribution; multiple and partial correlation; Wishart distribution; Hotelling's T distribution; multivariate analysis of variance; discriminant analysis; factor analysis	
<b>ICMA 435 Regression Analysis</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 151 Statistics for Science I	
Simple and multiple regression, diagnostics, model selection, models with categorical variables	
<b>ICMA 445 Seminar in Applied Mathematics</b>	<b>2 (2-0-4)</b>
<b>Prerequisites:</b> -	
Student presentations and discussions of research; review of topics of interest	
<b>ICMA 446 Research Project in Applied Mathematics</b>	<b>6 (0-12-6)</b>
<b>Prerequisites:</b> -	
Small research project in mathematics or related fields under the supervision of an advisor.	
<b>ICMA 484 Special Topics in Applied Mathematics III</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Topics of current interest	

<p><b>ICMA 485 Special Topics in Applied Mathematics IV</b></p> <p><b>Prerequisites:</b> -</p> <p>Topics of current interest</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMA 486 Special Topics in Applied Mathematics V</b></p> <p><b>Prerequisite:</b> -</p> <p>Topics of current interest</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMA 487 Special Topics in Applied Mathematics VI</b></p> <p><b>Prerequisite:</b> -</p> <p>Topics of current interest</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMB 201 Business Statistics</b></p> <p><b>Pre-requisite:</b> ICGN 104</p> <p>Basic statistics, probability distribution of random variable, estimation of hypothesis testing, a variance analysis, a probability distribution, chi-square test, correlation analysis and regression equation; programming application for statistics, and the use statistics to make business decisions</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMB 203 Microeconomics</b></p> <p><b>Prerequisite:</b> -</p> <p>Introduction to microeconomics principles, pricing theory, economic scarcity, consumer behavior, production costs, market structure, utility analysis, and distribution of income.</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMB 204 Macroeconomics</b></p> <p><b>Prerequisites:</b> -</p> <p>Introduction to macroeconomics principle, theories of output, consumption, inflation, unemployment, fiscal and monetary policy, international monetary system.</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMB 205 Microeconomics</b></p> <p><b>Prerequisite:</b> ICGN 104 Mathematics and Its Contemporary Applications</p> <p>Introduction to microeconomics principles; economic scarcity; opportunity cost; demand and supply; elasticity; consumer behavior; producer behavior; production costs; pricing theory; market structure; utility analysis</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMB 206 Macroeconomics</b></p> <p><b>Prerequisite:</b> ICGN 104 Mathematics and Its Contemporary Applications</p> <p>Data of macroeconomics, problems and issue related to economic environment, Gross Domestic Product (GDP), Consumer Price Index (CPI), multiplier, unemployment, inflation, money market, interest rate, fiscal and monetary policies, IS-LM model, AS-AD model, international trade, exchange rate, Mundell-Flemming model</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMB 207 Management of Business Information</b></p> <p><b>Prerequisite:</b> ICGN 104 Mathematics and Its Contemporary Applications</p> <p>Management business data and model, connecting data, shaping data, combining data, characterizing data, building data models, scenario management, goal seek, data tables and DAX, pivot tables, columns and measures calculations, visualization of data, reports, visualizers, dashboards</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICMB 213 Financial Accounting</b></p> <p><b>Prerequisite:</b> ICGN 104 Mathematics and Its Contemporary Applications</p> <p>A preparation of financial statements, recording and classifying financial transactions, characteristics of various types of accounts, accounting principles, and usefulness and limitation of accounting information</p>	<p><b>4 (4-0-8)</b></p>



- ICMB 214 Managerial Accounting** 4 (4-0-8)  
**Prerequisite:** ICMB 213 Financial Accounting  
 Basic cost concepts; the cost accounting systems; uses of management accounting for planning, control, performance evaluation and decision making purposes
- ICMB 215 Business Finance for Entrepreneurs** 4 (4-0-8)  
**Prerequisite:** ICMB 213 Financial Accounting  
 An introduction to the principles of financial management, the role of finance with the firm and its objectives; topics including time value of money; the valuation of financial assets; capital budgeting techniques; risk and return calculations; methodologies for determining the cost of capital; as estimation and forecasting of cash flows; and the project evaluation
- ICMB 216 Business Communication** 4 (4-0-8)  
**Prerequisite:** ICGN 104 Mathematics and Its Contemporary Applications  
 Accuracy and logic in writing, presentation of business development project, interpersonal communication, intercultural communication, conflict management, negotiation, written communication, oral communication
- ICMB 222 Principle of Marketing** 4 (4-0-8)  
**Prerequisite:** ICGN 104 Mathematics and Its Contemporary Applications  
 Marketing concepts, the role of marketing in organization, creating–communicating–delivering–exchanging product and services that having value to customers and the society; customer needs and wants, consumer decision making process, marketing information and research, market segmentation–targeting–positioning, product development and life cycle management; pricing, channel management, marketing communication, customer relationship management
- ICMB 235 Management and Organizational Behavior** 4 (4-0-8)  
**Prerequisite:** ICGN 104 Mathematics and Its Contemporary Applications  
 The role of managers in an organization; behavioral and administrative theories and concepts needed to succeed in the modern organization; organization structures; organizational changes; motivations; leadership; managing work and team; teamwork
- ICMB 236 Human Resource Management** 4 (4-0-8)  
**Prerequisite:** ICGN 104 Mathematics and Its Contemporary Applications  
 The HR trends and challenges in the modern workplace; investment perspective of HRM; social responsibility perspective of HRM; roles of a strategic human resource manager; comparative industrial relations; organizational analysis and work design; HR planning, recruiting, selection, evaluation, training and development, compensation and benefits; workforce diversity
- ICMB 237 International Business Management** 4 (4-0-8)  
**Prerequisite:** ICMB 235 Management and Organizational Behavior  
 International business operations; organization structure; finance and accounting systems; taxation systems; marketing strategy; cultural differences; global trade; capital markets and economic growth; the impact of regional trading blocs; corporate global competitiveness; global strategies
- ICMB 310 Business Law** 4 (4-0-8)  
**Prerequisite:** ICGN 104 Mathematics and Its Contemporary Applications  
 Introduction to laws, contract law, tort law, personal income tax, corporate income tax, other taxes and duties, company and partnership laws, property law, sales, service, lease laws, loan, mortgage, pledge, guarantee laws, agency laws and employment laws, intellectual property laws
- ICMB 311 Business Ethics and Sustainability** 4 (4-0-8)  
**Prerequisite:** ICMB 214, ICMB 237, ICMB 310  
 Analysis of ethical and sustainability concepts, implications of ethics and sustainability in business decisions, social and business-related environments, application of ethical principles, ethical issues in the organization and external environments

- ICMB 312 Management Science** **4 (4-0-8)**  
**Prerequisite:** ICMB 201, ICMB 207  
 Application of quantitative analysis techniques, linear programming, network models, decision analysis, business simulation
- ICMB 314 Operation and Project Management** **4 (4-0-8)**  
**Prerequisite:** ICMB 201, ICMB 312  
 Modern concepts, models and tools for planning, organizing, staffing, leading and controlling the production, distribution of goods and services
- ICMB 401 Business Innovation and Entrepreneurship** **4 (4-0-8)**  
**Prerequisite:** ICMB 222, ICMB 214, ICMB 236, ICMB 311, 4th year status  
 A study of entrepreneurial business strategy and innovation; the development of business plan; the new business ideas generation; the new business model; vision and mission, organizational plan, marketing plan, human resource plan, financial plan, risk management plan, action plan
- ICMB 402 Business Strategy** **4 (4-0-8)**  
**Prerequisite:** ICMB 222, ICMB 214, ICMB 236, ICMB 311, 4th year status  
 A study of strategic management; fundamental element of the organizational management strategy; process and frameworks of strategic management; an examination of both internal and external environment; competitive advantage; an identification of organization's mission, objective, policies and business strategy; foundation of a strategic analysis including the industry and company analysis; strategy formulation and implementation
- ICMB 490 Career Preparation** **1 (1-0-2)**  
**Prerequisite:** Juniors  
 The use of design thinking approach to develop self-awareness skills and prototype future career; self-assessment of knowledge, skills, people, and conditions; self-inventory of lifestyle and value; conducting effective career experiment; career vision, and life mapping exercise, and action plan to pursue the target career
- ICMB 496 Practical Business Training – On Campus** **8 (2-32-10)**  
**Prerequisite:** Seniors, ICMB 490  
 An on-campus internship program at the Brew & Bev Bistro providing a practical business experience for MUIC students; applications of business knowledge and skills learned in class; a summative evaluation of students' teamwork, analytical thinking skills, innovativeness, ethics and sustainability, and management knowledge and skills
- ICMB 497 Practical Business Training – Off Campus** **8 (0-40-8)**  
**Prerequisite:** Seniors, ICMB 490  
 An internship program in off-campus organizations providing practical business experience for MUIC students; applications of business knowledge and skills learned in class; a summative evaluation of students' teamwork, analytical thinking skills, innovativeness, ethics and sustainability, and the management knowledge and skills
- ICMB 498 New Business Development Program** **8 (2-32-10)**  
**Prerequisite:** For 4th year student, ICMB 490 Career Preparation  
 An internship program in off-campus organizations providing practical business experience for MUIC students; applications of business knowledge and skills learned in class; a summative evaluation of students' teamwork, analytical thinking skills, innovativeness, ethics and sustainability, and the management knowledge and skills
- ICMC 101 Introduction to Media and Communication** **4 (4-0-8)**  
**Prerequisites:** -  
 Introduction to communication, its meaning, theories, content and processes (studies on face-to-face human interaction, mass media, and contemporary digitized format). Analysis of evolving concepts in entertainment, private recreation, leisure activity, and the entertainment industry through case studies from around the world.
- ICMC 102 Man and the Arts for Media and Communication** **4 (4-0-8)**  
**Prerequisites:** -  
 Study of the dynamic relationship of man, arts and society with focus on the function of communication. Theories on aesthetics will be used to analyze various kinds of media, such as visual arts, performing arts and music, to interpret content, subject matter and value of work of arts.

- ICMC 103 Visual Communication** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to visual communication theory and processes. Examination of basic visual components, its relation and impact on viewers' perception, perspectives and understanding through examples of visuals drawn from advertising, political campaigns, TV news, documentaries, films and interactive media to create greater understanding of the influence of visuals influence on society.
- ICMC 104 Audio Communication** 4 (4-0-8)  
**Prerequisites:** -  
Use sound to complement images in the process of communication; explore meanings and feelings experienced by audiences in reaction to various kinds of sounds including music; and apply audio equipment to specific purposes and conditions.
- ICMC 105 Media, Communication, Art and Socio-Cultural Perspectives in Southeast Asia** 4 (4-0-8)  
**Prerequisites:** -  
Interdisciplinary study to explore interrelationship between media, society, art and culture with focus on Southeast Asian region to prepare students for the new ASEAN economic community. Study covers traditional, new media, local-communal performance, national and ASEAN heritage, and the influence of media and communication on art, society and culture in Southeast Asia, and vice versa.
- ICMC 106 Creative Writing for Communication** 4 (4-0-8)  
**Prerequisites:** -  
Study of theory and practice in writing skill for communication purposes, covering various writing styles and genres from personal to professional contexts, dramatic contents to complex factual documentaries, press releases and public service announcements to advertisement and political propaganda. Emphasis is on clear communicative writing, appropriate format, and focused writing style.
- ICMC 107 Global Media Culture and Industry** 4 (4-0-8)  
**Prerequisites:** -  
Overview concept of global media culture and industry in the context of globalization, with examination of theories, research and practices in creative and culture industry of various forms (film, digital media, and TV broadcasting). Focus on the transformation of media industries by political economy, culture and technological changes, and the impact of such transformation on content across media platforms; includes international media policies.
- ICMC 201 Media and Communication Regulations and Ethics** 4 (4-0-8)  
**Prerequisites:** -  
Study of free speech as a fundamental platform; covers both on local and international philosophy, ethics, professionalism, laws, and governmental regulations; includes case studies of morals and responsibilities associated with mass communication and media practitioners.
- ICMC 202 Media and Cultural Theory** 4 (4-0-8)  
**Prerequisites:** -  
Analysis of the nature of human communication in terms of its physical, psychological, linguistic and sociological bases such as personal communication, interpersonal communication, small group communication, organization communication, and mass communication. Core theoretical framework of subject: interaction between communication and society, culture, social groupings, and mental processing.
- ICMC 203 Popular Entertainment** 4 (4-0-8)  
**Prerequisites:** -  
An investigation of overall concept of popular entertainment (live shows e.g theatres, circuses, carnivals; and recorded media e.g TV and films as art forms that contain symbolic contextual references to culture, history, society and ideology). The course uses a rotating series of topics to explore concepts by applying the interdisciplinary approach comprising the fields of history, anthropology, sociology, humanity and political science. Topics: Bakhtin's Carnavalesque, Theatre of The Absurd, Images of Madness, Consensus and Rebellions, etc.

- ICMC 204 Research Methods and Basic Statistics in Communication and Cultural Studies** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to media and communication research; uses interdisciplinary approach e.g. social science and humanity to solve research problems empirically. Topics include asking the 'right' questions, procedures in conducting research, basic principles of research, random sampling, questionnaire design, experimental research design, and content and research data analysis.
- ICMC 205 Media Psychology and Audience Analysis** 4 (4-0-8)  
**Prerequisites:** -  
Multidisciplinary course drawing from sensory, narrative and cognitive psychology, motivation and learning theories, neuroscience, and advertising and marketing; analyzes psychological impact of media content and presentation (traditional sources of sight and sound, new interactive, digital media); includes understanding human behaviour through working with media application, impact of media on individuals and society, and its use for social and political purposes; concludes with receptive audience analysis, validation of target market, and demographic, attitudinal and environmental analysis.
- ICMC 206 Basic Acting** 4 (0-8-4)  
**Prerequisites:** -  
Practice-based learning on becoming a complete human being, accepting the truth of self and truthfulness to the soul. Understanding acting as a presentation of 'truth' through development of body relaxation and control, vocal training, trust and sensory awareness, improvisation and imagination. Practice of script interpretation, character development and acting approaches for performers. Realistic acting scripts will be used for final acting presentation.
- ICMC 207 Entertainment Management, Marketing and Finance** 4 (4-0-8)  
**Prerequisites:** -  
Theoretical framework: principles and strategies of management, marketing and finance. Core concern: entertainment industry (live performances, recorded media and digital technology-industries). Focus on application of marketing concepts relevant to various kinds of entertainment industries, budgeting considerations and propositions; identification and analysis of target markets and audiences, and presentation and sale of entertainment products etc.
- ICMC 211 Introduction to Mass Communication and Journalism** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to the study of communication, integrated mass media and journalism; includes their revolution, definitions, boundaries, principles; emphasizes on procedures, structures and formats found in print, video and online media.
- ICMC 212 Writing and Presenting in Mass Communication and Journalism** 4 (4-0-8)  
**Prerequisites:** -  
Instruction and practice in creating integrated creative and insightful writing; covers principles, formats, and steps in various forms of mass communication and journalistic writing (feature stories, journalist documentaries, news reporting, writing in newspaper and scripting broadcast media). Topics include information seeking, data gathering, factual verification, writing opinions and presenting information with an emphasis on clarity, and creativity, and developing a voice through writing with reasoned points of view that are supported by ideas and facts.
- ICMC 213 Mass Media and Public Policy** 4 (4-0-8)  
**Prerequisites:** -  
Examination of the crucial role that mass media plays in the formation of public policy especially on information distribution and media's incentives that affect different types of groups in society; and the transformation of the modern platform of mass media through various socio-political policies. Analysis of various case studies on interrelationship between mass media and public policies in the local, ASEAN and global spheres.

- ICMC 214 Comparative Media Issues: ASEAN vs the world** 4 (4-0-8)  
**Prerequisites:** -  
Focus on comparative media issues that gain significant recognition in Southeast Asian region and the world (diplomatic relationship, regional politics, labour immigration, political economy, energy resources, entertainment industry etc). An exploration of issues that gain a global following, and those that garner regional or localized interest, news driven by issues, countries and their global positions, and impact of news on people's lives. A scrutiny of identities, unity, conflicts and crisis, problems and co-operation of ASEAN countries and the world through both examination of media issues and comparison between ASEAN and the global.
- ICMC 215 Integrated Broadcasting Production: Creating Television and New Media Content** 4 (0-8-4)  
**Prerequisites:** -  
Practice on creating and distributing broadcast content and production (popular format of television and new digital media) for multiple platforms and adapting to fast-paced changes in media consumption patterns and devices; includes study of linear and non-linear television, applications of media devices and the broadcast digital media platform.
- ICMC 216 Convergence Journalism: Writing and Producing for Media** 4 (4-0-8)  
**Prerequisites:** -  
Study of cross-media cooperation involving writing, broadcasting, producing, creating still and moving images, and internet sites for the purpose of journalism to create larger journalistic projects and outlets; examination of the overall concept and procedure of multimedia presentation when all forms of media journalism converge (from printed media to video clips in web sites).
- ICMC 221 Art of Storyboarding** 4 (4-0-8)  
**Prerequisites:** -  
Focus on creation and development of a storyboard, combination of cinematic storytelling skills with drawing, application of film language and narratives, study of script interpretation for film, television, and broadcast media, and telling stories through visualization.
- ICMC 222 Textual Analysis** 4 (4-0-8)  
**Prerequisites:** -  
Study of analysis and interpretation of various forms of texts to describe content, structure, and functions of the message; covers major approaches to textual analysis (rhetorical criticism, content analysis, interaction analysis, and performance studies).
- ICMC 223 Southeast Asian Creative Content Analysis: from Ethno-Historiography Perspectives** 4 (4-0-8)  
**Prerequisites:** -  
Introduction to creative content analysis of Southeast Asian regional communities from ethno-historiography, anthropological and humanity perspectives to understand 'originality' and 'authenticity' of ASEAN content; include study of various forms of creative contents (prose and poems, performance and music, paintings and artifacts, and media forms).
- ICMC 224 Literature as a Source of Media Content** 4 (4-0-8)  
**Prerequisites:** -  
Study of world renowned Western and Oriental literatures as sources of media content of today's world to understand the process of creating deep and dimensional media content through appreciating the classics and masterpieces of dramatic contents. Focus on the transformation of dramatic content and media forms from written literary texts into live performance (theatres, operas, ballets), and recorded media of entertainment industry (films and TV).
- ICMC 225 Visual Storytelling** 4 (4-0-8)  
**Prerequisites:** -  
Analysis of narratives in visual media (film and television). Examination of the processes of expressing ideas and emotions through various visual elements, and enhancement of story-telling through visual components.

- ICMC 226 Movement and Human Body** **4 (0-8-4)**  
**Prerequisites:** -  
 Practice-based class on the exploration of relationship between movement, self, culture and environment. Designed to enhance students' personal presence, self-discovery, expressiveness, power and flexibility. Students to learn how to free and relax the body, improvise and design movements that characterize other beings (characters, animated figures and animals).
- ICMC 311 Dramatic Writing** **4 (4-0-8)**  
**Prerequisites:** ICMC 106 Creative Writing for Communication  
 Basic principles of dramatic construction writing (story and plot development, building and developing characters, creating theme and conflicts, weaving story line etc.); covers examination of case studies on writing in various media formats (play scripts, TV drama series and feature film scripts).
- ICMC 312 TV Script Writing** **4 (4-0-8)**  
**Prerequisites:** ICMC 106 Creative Writing for Communication  
 Introduction to TV scriptwriting: from conception to final script; study of script structure and writing practice in various short program formats such as demonstration, news, features, documentaries, TV drama series and variety shows.
- ICMC 313 Film Screenwriting** **4 (4-0-8)**  
**Prerequisites:** ICMC 106 Creative Writing for Communication  
 Focus on standard elements of a film: theme, plot, character, and dialogue; covers writing a short film script and Act I of an original feature film script (professional format) and outline of Act II and Act III.
- ICMC 314 Style and Presentation in Writing** **4 (4-0-8)**  
**Prerequisites:** ICMC 106 Creative Writing for Communication  
 The theory and practice of using different writing styles and formats in written presentation, including the principle of targeting readers and communicating ideas and information to them effectively by selecting suitable writing styles and presentation. Analysis of different formats of writing (editorial news columns, film scripts, TV documentaries, public policy announcements etc.).
- ICMC 321 Acting I: the Fundamentals** **4 (0-8-4)**  
**Prerequisites:** ICMC 206 Basic Acting  
 The instruction and practice relating to realistic and naturalistic acting. Hands-on practice covers realistic acting approach, character interpretation, objective, conflict, actor's emotional memory, improvisation, emphasizing Stanislavsky's acting system and Strasberg's Method.
- ICMC 322 Acting II: Advanced Acting** **4 (0-8-4)**  
**Prerequisites:** ICMC 321 Acting I: the Fundamentals  
 Study of various non-realistic styles of acting (absurd, comedy, Greek and Shakespeare, and musical); includes advanced acting training and master class in acting techniques (mask performance training, commedia dell'arte and clowning).
- ICMC 323 Acting for TV and Film** **4 (0-8-4)**  
**Prerequisites:** ICMC 206 Basic Acting  
 Practice-based class on acting for the camera; training on acting with subtlety and composure among the film crew, at real shooting locations and under time constraints. Training on working with different camera angles and re-shooting the same lines. Principle scripts to use for acting include various masterpiece film scripts.
- ICMC 324 Choreography** **4 (0-8-4)**  
**Prerequisites:** ICMC 226 Movement and Human Body  
 The art and techniques of designing sequences of movement that contain both form and motion while narrating story and carrying meanings of ideas and emotions.

- ICMC 331 Directing I: Directing the Actors** 4 (0-8-4)  
**Prerequisites:** ICMC 206 Basic Acting  
Study on director work methodology with actors to activate and create 'truthful' characters for theatre, film and TV drama. Emphasis on the collaboration process in the director-actor working relationship (communication, coaching, script interpretation, analysis of actor's weaknesses and strengths in acting, and solving acting problems with actors).
- ICMC 332 Directing II: Directing for Recorded Media** 4 (0-8-4)  
**Prerequisites:** ICMC 206 Basic Acting  
Understanding the underlying principles behind shooting and working with cameras, and applying them in different circumstances. Content includes knowledge in operating sound and lighting kit, and its creative possibilities; emphasis on a powerful system of single-camera blocking and the language of camera work and its narration of the story.
- ICMC 341 Genre Studies** 4 (4-0-8)  
**Prerequisites:** -  
Study of genre in film and television, theoretical and historical contexts, specific case studies, ranging from melodrama and horror to westerns and science fiction.
- ICMC 342 Film Criticism** 4 (4-0-8)  
**Prerequisites:** -  
Theory and practice of film criticism; covers the study of development of criticism theories, their significance and impact to the film industry and audiences' development. Practice in writing criticism for film through study of international masterpieces of written film criticism.
- ICMC 343 Approaches to Media-Film and TV-Theory and Critical Studies** 4 (4-0-8)  
**Prerequisites:** -  
Survey of important approaches to media-film and TV; employs interdisciplinary methodology, with an introduction to formalism, realism, the concept of authorship in film and television, and ideology in media; includes study of structuralism, post-structuralism, specific strains of critical studies, media, new media theories, and important theorist figures in the field.
- ICMC 344 Film History** 4 (4-0-8)  
**Prerequisites:** -  
Survey of film history; includes overview of notable films and filmmakers from the beginnings of cinema to the present; covers important issues in technological and social developments that had an impact on the motion picture industry worldwide. The focus centers on American/Hollywood cinema, and also addresses the history of European cinema as well as developments in Asian and Latin American cinema.
- ICMC 351 Multi-Camera Shooting** 4 (0-8-4)  
**Prerequisites:** -  
Study of artistic and technical knowledge in a multi-camera shoot, as well as the aesthetic and production aspects; covers exploration of the roles of various crew members and communication between director, cast and crew. Case studies include various multi-camera shooting programs in studio (evening news, sitcoms, talk shows etc.).
- ICMC 352 TV Pre-Production** 4 (4-0-8)  
**Prerequisites:** -  
Stages in pre-production: research, development of a viable concept for production proposal, planning, management, and assignments for various forms of TV broadcast programs.
- ICMC 353 TV Post-Production** 4 (0-8-4)  
**Prerequisites:** -  
Study of artistic and technical principles of video and audio editing: manipulation of images using non-linear editing; the addition of sound to complement images; and special effects.

- ICMC 361 Cinematography** 4 (0-8-4)  
**Prerequisites:** -  
Technical standards of cinematography in feature films: principles and methods of visualization; use of camera movement; lens selection; lighting techniques; basic film manipulation.
- ICMC 362 Film Pre-Production** 4 (4-0-8)  
**Prerequisites:** -  
Study of preparation process before shooting; includes preparing script for shooting, storyboarding, planning with regard to shooting locations, props, cast members, costumes, special effects and visual effects. Production of detailed schedule and shooting arrangements.
- ICMC 363 Film Post-Production** 4 (0-8-4)  
**Prerequisites:** -  
Practice-based class on techniques of film and video editing, color correction and addition of music and sound to film narration and visualization.
- ICMC 371 Theories of Marketing for Media and Communication** 4 (4-0-8)  
**Prerequisites:** -  
Instruction on fundamental principles of marketing in the mass media and entertainment industry; understanding consumer behavior and marketing segmentation, target setting and positioning, environment, branding and product development, promotion, pricing, distribution, limitations of marketing management; and possible solutions to problems.
- ICMC 372 TV Marketing and Sales** 4 (4-0-8)  
**Prerequisites:** -  
Instruction on TV program marketing and sales: applying marketing concept to a TV program; budgeting consideration and planning; sponsorship management; identifying and understanding target markets; sales and presentation tools and techniques.
- ICMC 373 Film Producing** 4 (4-0-8)  
**Prerequisites:** -  
Role and responsibilities of the film producer: script selection, director and crew recruitment, actor negotiations, pitching investors, director-producer collaboration, publicity, and distribution; covers understanding of local and international markets and analysis on international film festivals and marketing opportunities.
- ICMC 374 Integrated Marketing Communication** 4 (4-0-8)  
**Prerequisites:** -  
Understanding the principle of diverse aspects in integration of business and marketing in IMC for entertainment industry; includes organizational culture, 4 P's, advertising, direct marketing, online marketing and PR etc. Case studies on various media products.
- ICMC 381 Field Study in Media and Communication** 4 (4-0-8)  
**Prerequisites:** -  
Local or international field study focusing on expanding knowledge in the field of entertainment media and communication.
- ICMC 382 Independent Study in Media and Communication** 4 (4-0-8)  
**Prerequisites:** -  
Independent study tailored to fit individual interests in a specific area of entertainment media and communication.
- ICMC 383 Seminar in Media and Communication** 4 (4-0-8)  
**Prerequisites:** -  
Understanding issues relating to media and communication through discussion, debates and intellectual interrogation. Lectures and presentations by guest speakers on some specific issues related to the theme set for each class.



<b>ICMC 384 TV Post-Production II</b>	<b>4 (0-8-4)</b>
<b>Prerequisites:</b> -	
Advanced study of artistic and technical principles in video and audio editing; the manipulation of images using non-linear editing; the addition of sound to complement the images; and special effects.	
<b>ICMC 385 Film Post-Production II</b>	<b>4 (0-8-4)</b>
<b>Prerequisites:</b> -	
Advanced practice-based class on techniques of film and video editing, color correction and the addition of music and sound in the film narration and visualization.	
<b>ICMC 386 Event Management for Entertainment Media and Communication</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> -	
Instruction and practice on key elements in setting up and managing an event (fundraising and sponsorship, finance and budget management, public relations and advertisement, ticketing, documentation, producing contents, manpower management etc.).	
<b>ICMC 387 Theatre Production and Management I</b>	<b>4 (0-8-4)</b>
<b>Prerequisites:</b> -	
Instruction and practice on key elements in a theatre production (stage management, lighting design and control, setting design and construction etc.).	
<b>ICMC 388 Theatre Production and Management II</b>	<b>4 (0-8-4)</b>
<b>Prerequisites:</b> -	
Advanced instruction and practice on key elements in theatre production (stage management, lighting design and control, setting design and construction etc.).	
<b>ICMC 389 Special Effects Make-up for Television and Film</b>	<b>4 (0-8-4)</b>
<b>Prerequisites:</b> -	
Introduction to special effects make-up: developing and creating imaginative characters with unique features; creating realistic injuries and marks.	
<b>ICMC 391 Professional Internship in Media and Communication</b>	<b>12 (0-36-12)</b>
<b>Prerequisites:</b> -	
Internship in professional companies and agencies, concluding with a seminar and presentation to summarize the internship experience in professional context of entertainment media and communication.	
<b>ICMC 401 Media and Communication Degree Project Research and Preparation</b>	<b>4 (0-8-4)</b>
<b>Prerequisites:</b> -	
Integration of knowledge, skills, and techniques acquired throughout the course of study in developing and researching an entertainment media and communication project proposal and planning for approval e.g. film or theatre productions, TV drama series, variety programs or documentaries, journalistic projects, media campaigns, and academic research projects.	
<b>ICMC 402 Media and Communication Degree Project I</b>	<b>4 (0-12-4)</b>
<b>Prerequisites:</b> -	
Approval process of degree project, rehearsal and production sessions.	
<b>ICMC 403 Media and Communication Degree Project II</b>	<b>4 (0-12-4)</b>
<b>Prerequisites:</b> -	
Screening, staging, presenting project to public audiences and completion of Degree Project Book.	

**ICMB 315 Remedial English**
**0 4- -0)**
**Prerequisites: Placement test**

A remedial course preparing students for reading and writing academic English at a level suitable for entering the Intermediate English Communication I

**ICMF 316 Financial Management**
**4 (4-0-8)**
**Prerequisite: ICMB 214, ICMB 215**

Goal of financial management, financial markets and yields, the concept of corporate governance in financial management, corporate valuation model, financial statement analyses, working capital management, long-term financial planning and forecasting, risk and return for stand-alone assets and the portfolio, the capital market theory, capital structure theories and practice, distributions to shareholders

**ICMF 317 International Financial Markets**
**4 (4-0-8)**
**Prerequisite: ICMB 215**

International financial markets from a macro-finance perspective; theme on role of money, interest rates and fixed income assets; main focus on monetary policy, monetary system from a macro-finance perspective; revising to be up to date, looking at disruptive technologies, innovations and their impacts on monetary finance

**ICMF 318 Investments Analysis and Portfolio Management**
**4 (4-0-8)**
**Prerequisite: ICMF 316**

Types of investors; types of investment vehicles in the investible universe; the investment policy statement; different investment strategies for different types of investors; quantitative and qualitative aspects of risk and return associated with investment decisions; the portfolio optimization techniques; portfolio performance evaluation against pre-defined benchmarks and investment objectives

**ICMF 319 Multinational Corporate Finance**
**4 (4-0-8)**
**Prerequisite: ICMB 215, ICMB 237**

An examination of international finance from a standpoint of a company; the international monetary system and currency regimes; foreign exchange markets including spot and derivative markets; international parity conditions and applications; foreign exchange rate risk and exposure; operational and financial hedging; raising capital from international capital markets; the formulation of investment and financial strategies for foreign operations

**ICMF 320 Business Taxation**
**4 (4-0-8)**
**Prerequisite: ICMB 214, ICMB 310**

Corporate taxation, partnership taxation, withholding tax, value added tax (VAT), tax computation, tax return, tax planning and ethics, tax accounting, and tax effects on the financial analysis

**ICMF 321 Intermediate Accounting**
**4 (4-0-8)**
**Prerequisite: ICMB 214, ICMB 215**

A study of accounting principles and procedures essential to the preparation of financial statements with particular emphasis on in-depth asset, liability and shareholder's equity, for example, revenue recognition, asset valuation, contingent liability, lease, earnings per share, deferred taxes, and all related disclosures

**ICMF 322 Risk Management and Derivatives**
**4 (4-0-8)**
**Prerequisite: ICMF 316**

An introduction to the risk management concept for corporation; an overview of the fundamental knowledge of derivative instruments—forward, future, and option; quantitative and qualitative analyzing the risk for the corporate; controlling the risk with appropriate hedging techniques

**ICMF 323 Banking and Financial Institutions Management**
**4 (4-0-8)**
**Prerequisite: ICMF 317**

Modern financial institutions from a bank management perspective; topics include risk of financial institutions, commercial banks, and methods through which these risks are managed; innovations in the banking industry and the decentralization of banking

- ICMF 324 Big Data and Financial Analytics** 4 (4-0-8)  
**Prerequisite:** ICMB 207, ICMB 215  
 Understanding the data analysis process with big data analysis; financial/economic problem formulation based on sound business landscape analyses; internal and external data identification and preparation; applying appropriate data analytics tools and algorithms for descriptive, predictive and prescriptive analytics; generating informed business insights, strategies and plans for solving key financial/economic problems
- ICMF 420 Financial Analysis and Modeling** 4 (4-0-8)  
**Prerequisite:** ICMF 316, ICMB 214  
 The capstone course for students majoring or minoring in finance; a formulation of financial models for financial and investment decision making; a financial statement analysis, corporate valuation, risk modeling, a sensitivity analysis and a financial simulation using the spreadsheet-based financial models; Visual Basic (VBA) applications in Finance, financial modeling project for real-world corporations
- ICMF 425 Corporate and Alternative Asset Valuations** 4 (4-0-8)  
**Prerequisite:** ICMF 318  
 Valuation on public firms and any cash flow producing assets such as real estates, private companies, and divisions; relative valuation approach, such as P/E, P/B, P/CF, EV/EBITDA on different types of industries or companies; factors involved in valuation such as CAPM, WACC, and the un-levering and re-levering of Beta; the valuation of non-producing cash flows such as cryptocurrencies and blockchain technology
- ICMF 426 Special Topics in Finance** 4 (4-0-8)  
**Prerequisite:** Juniors  
 A study of contemporary issues, industry trends, theories, and best practices in finance in response to the changing business environment
- ICMF 427 Financial Theory and Innovation in a Disruptive World** 4 (4-0-8)  
**Prerequisite:** 4th year student  
 Understanding financial and disruptive innovation theories, the application of financial theory under disruptive environment to business decision; decisions under certainty and uncertainty with the expected utility framework; classical financial theories such as capital structure, capital budgeting, dividend policy, and modern portfolio theory with the disruptive innovation concept
- ICMI 331 Global Logistics and Supply Chain Management** 4 (4-0-8)  
**Prerequisite:** ICMB 237  
 International logistics management; upstream and downstream business activities; procurement; demand forecasting; operations and production; warehouse and distribution center; logistics network design; supply chain technologies; transportation mode; inventory management
- ICMI 332 Diversity, Cross Culture and Expatriate Management** 4 (4-0-8)  
**Prerequisite:** ICMB 236, ICMB 237  
 Theories and concepts of diversity and inclusion; surface-level diversity; generation; gender diversity; deep-level diversity; personality and values; meanings and dimensions of culture and cultural differences across the globe; an analysis of similarities and differences in cultures and value systems and the impact on management practices; organizational cultures and diversity; cross-cultural communication and negotiation; management decision and control across cultures; motivation and leadership across cultures; an expatriate assignment; contemporary issues in expatriate management
- ICMI 333 Global Trade, Policies, and Regulations** 4 (4-0-8)  
**Prerequisite:** ICMB 206, ICMB 237  
 Global trade, policies, and regulations; regional economic integration and the utilization of preferential trade agreements; trade barriers and the impacts on international trade; the regulations on export procedures; customs formalities; harmonization system; INCOTERMS; obligations under sale, insurance, carriage, and letter of credit contracts

- ICMI 431 Risk Management in International Business** 4 (4-0-8)  
**Prerequisite:** ICMB 207, ICMB 215, ICMB 237  
Risks in international business; political, economic and financial risks; Identification of strategies to identify, assess, manage and mitigate risk associate with global business operation
- ICMI 432 Internationalization Strategy** 4 (4-0-8)  
**Prerequisite:** ICMI 333, ICMI 431, 4th Year students  
Internationalization strategies for SME and family businesses; management of functional areas of business for internationalization; motivation and model for international expansion; the international expansion mode and strategy; managing cost and risk of internationalization; barriers for internationalization; the role of decision maker for international expansion; creating a meaningful internationalization strategy for SMEs
- ICMI 334 Regional Business Study** 4 (4-0-8)  
**Prerequisite:** ICMB 237  
Comparative analysis of market structures, a unique set of issues and characteristics of each specific regional market; opportunities and challenges; business model and entry strategy selection in each specific regional market; roles of innovation and technology for market penetration in regional markets
- ICMI 335 Legal Issues in International Business** 4 (4-0-8)  
**Prerequisite:** ICMB 237, ICMB 310  
Legal principles of international business; written contracts; documents of foreign investment; tax planning; protection of intellectual property rights and licensing; the legal issues in relational to international business operation
- ICMI 336 Leadership and Change Management in Global Business** 4 (4-0-8)  
**Prerequisite:** ICMB 235, ICMB 237  
Models and approaches for managerial behavior; developing managerial and leadership skills; dimensions, and challenges of change in global organizations; the need, vision, strategies, and initiation for change; politics of change; change resistance and transition management
- ICMI 337 Management and Governance in Multinational Enterprises** 4 (4-0-8)  
**Prerequisite:** ICMB 237  
Theories and concept of corporate governance of multinational company; roles of director; corporate culture; control, monitoring, and evaluation, the legal environment; stakeholder management; corporate governance implementation; current issues of governance from the global and local perspectives
- ICMI 436 Special Topics in International Business** 4 (4-0-8)  
**Prerequisite:** Juniors  
Contemporary issues; industry trends; theories and best practices in international business in response to the changing business environment
- ICMI 457 International Business Negotiations** 4 (4-0-8)  
**Prerequisite:** ICMB 351  
An exploration of negotiation concepts developed in a number of academic fields, including psychology, law, finance, and communication; exposition to experience in real negotiations; development of individual abilities to negotiate through a series of individual and class exercises and negotiation simulations; realization of one's own negotiating preferences and the consequences of the choices made; ability to accept and offer feedback on negotiation behavior demonstrated and observed.

- ICMK 351 Consumer Insights - A Qualitative Approach** 4 (4-0-8)  
**Prerequisite:** ICMB 222  
The importance of consumer insights, psychological aspects of consumer behavior, the role of qualitative approach in discovering insights; qualitative research procedures; qualitative data collection methods, focus group, in-depth interview, observation, projective techniques; data collection and fieldwork; data coding, qualitative data analysis methods; interpreting insights, turning insights into marketing ideas
- ICMK 352 Market Intelligence - A Quantitative Approach** 4 (4-0-8)  
**Prerequisite:** ICMB 201, ICMB 222  
Marketing research tools, techniques, and process to arrive at conclusion; identifying and collecting information, analyzing and interpreting the data, using data to make decision
- ICMK 353 Consumer Behaviour and Decision Making** 4 (4-0-8)  
**Prerequisite:** ICMB 222  
A study of consumer behavior, the decision making process, psychological responses, and sociological influences on the consumer decision; consumer decision and its impact on marketing decision; formulation of marketing strategy in response to the consumer decision behavior
- ICMK 361 Digital Marketing** 4 (4-0-8)  
**Prerequisite:** ICMB 222  
An overview of digital marketing, online marketplace analysis—macro and micro environment; online customer personas and decision journey; the digital marketing process; objective and budgeting for digital marketing program; digital marketing tools; developing a digital marketing program; evaluation of digital marketing project
- ICMK 461 Marketing Strategy for Sustainability** 4 (4-0-8)  
**Prerequisite:** ICMB 222, 4th year students  
A macro-environment analysis, an opportunity and challenge analysis, vision and mission; branding strategy, product strategy, pricing strategy, distribution strategy, communication strategy, innovation strategy, growth strategy, defensive strategy; sustainability concept, sustainability impact assessment
- ICMK 354 New Product Management** 4 (4-0-8)  
**Prerequisite:** ICMB 222  
An examination of managing the new product development process of bringing new products and services to the market within a strategic content; sources for identifying opportunities; techniques for idea generation; methods for concept development and evaluation; creation of perceptual maps; approaches for product and marketing development; conducting business analysis for a new product; strategies to position new products; types of market testing; formulation of new product launch strategies; assessing product line impacts
- ICMK 355 Integrated Marketing Communications** 4 (4-0-8)  
**Prerequisite:** ICMB 222  
An exploration of the nature and purpose of advertising and sales promotion in accordance with an integrated marketing communications perspective; showing how these activities will fit into the general process of marketing management; addressing marketing objectives and budget, target audience selection, the communication objective, the creative strategy, the integrated communication strategy and the media strategy
- ICMK 362 Strategic Brand Management** 4 (4-0-8)  
**Prerequisite:** ICMB 222  
A strategic planning perspective to explore theories, concepts and tools applicable to the management of a brand; perspectives of consumer-based brand equity; types of brand strategy; coordination of brand marketing programs; mapping of brand associations; the development of a brand audit; measurement and interpretation of brand performance; management and growth of brand equity; approaches for brand expansion; alternative brand architectures; strategies for brand reinforcement and revitalization

- ICMK 451 Distribution and Retail Channels** **4 (4-0-8)**  
**Prerequisite:** ICMB 222  
 The accessibility of product and service through the distribution channel; setting up distribution strategy, designing distribution structure, and managing distribution channel from manufacturer's and retailer's perspectives by answering channel members' and consumers' needs; the impact of marketing channel decisions on marketing strategy
- ICMK 452 Business Marketing and Selling Strategy** **4 (4-0-8)**  
**Prerequisite:** ICMB 222  
 Understanding the nature of organization buyers and its buying behavior; business buyer segmentation, customer relationship management, pricing, and product development; basic components of selling function; tools for selling process
- ICMK 453 Global Marketing Strategy** **4 (4-0-8)**  
**Prerequisite:** ICMB 222, ICMB 237  
 Differences between single country marketing and international marketing; global economic and trade environment, global social and cultural environment, global political and legal environment; emerging markets' characteristics, developed markets' characteristics; segmentation, targeting, and positioning in the global market; market selection process; mode of entry; the marketing strategy in foreign markets
- ICMK 456 Special Topics in Marketing** **4 (4-0-8)**  
**Prerequisite:** Juniors  
 A study of contemporary issues, industry trends, theories, and best practices in marketing in response to the changing business environment
- ICML 101 Elementary German I** **4 (4-0-8)**  
**Prerequisites:** -  
 Greetings, introduce oneself or others, German alphabet and phonemes, personal information, numbers from 1 – 100 and price quotations, express wishes, tell the time and make appointments, quality of items, shop in a supermarket, measurements; verb forms, pronouns, sentence structure, gender of nouns, accusative case and plural forms, negation.
- ICML 102 Elementary German II** **4 (4-0-8)**  
**Prerequisites:** ICML 101  
 Order and pay for meals in a restaurant, preferences of food and drinks, giving and asking for directions, reading a map, preferences of work conditions, job advertisements; essay writing, yes/no questions, imperative forms, compound verbs, preposition with dative case, modal verbs I, German sentence bracket.
- ICML 103 Elementary German III** **4 (4-0-8)**  
**Prerequisites:** ICML 102  
 Health advice and problems, healthy and unhealthy life styles, housing I, advertisement for apartments, furniture and equipment I, events and accidents, travel reports, curriculum vitae (CV); possessive articles in nominative, accusative and dative case, perfect tense, connectors, modal verbs II.
- ICML 111 Elementary Japanese I** **4 (4-0-8)**  
**Prerequisites:** -  
 Hiragana and Katakana characters; greeting and introducing oneself; pointing at things and asking about them; asking places of various things; asking about products and their prices; telling time and days of the week; describing simple daily activities; expressing actions using vehicles; inviting a person to do things together; Number 0 1,000,000.

- ICML 112 Elementary Japanese II** **4 (4-0-8)**  
**Prerequisites:** ICML 111  
 40 Kanji characters; asking what things are called in Japanese; describing the action of giving and receiving things between people; describing situations and feelings using adjectives; expressing what one likes/ dislikes and is good/poor at; describing reasons and causes; describing the existence of things, people and animals; expressing the quantity of various things; expressing feelings and impressions about the past events and experiences; expressing what one wants and wants to do.
- ICML 113 Elementary Japanese III** **4 (4-0-8)**  
**Prerequisites:** ICML 112  
 40 Kanji characters, giving instructions and offerings; describing what one is doing; asking permissions and understanding prohibited actions; describing family and work; giving simple description and explanation about people, things and places; making confirmation on what one has to and does not have to do; describing hobbies; describing the changes of things and situations; making conversation with friends using plain style of speech.
- ICML 121 Elementary French I** **4 (4-0-8)**  
**Prerequisites:** -  
 Numbers from 0 to 69; how to introduce yourself; greet other people; gender of nouns; plural of nouns; articles (definite, indefinite); qualifying adjective; present tense forms of verbs: tell and understand phone numbers; tell dates.
- ICML 122 Elementary French II** **4 (4-0-8)**  
**Prerequisites:** ICML 121  
 Talk about a trip schedule; tell and ask for the date and the time; check in in a hotel; enquire about hotel facilities; purchase a train ticket; understand and give directions; count from 100 to 1000; interrogative forms (3) (Questions with est-ce que, qu' est-ce que, que, quoi, combien de...); present tense forms of the -er, -ir, -re -oir, negative form.
- ICML 123 Elementary French III** **4 (4-0-8)**  
**Prerequisites:** ICML 122  
 Book a table and order a meal at a restaurant; tell what you like and what you don't like; order traveller's cheques and ask for exchange rates, open a bank account; buy gifts; ask for and understand directions; imperative mood; future tense; buy clothes; telling quantities; partitive article, passé composé built with avoir; 'Going to' future tense: aller + infinitive; present tense conjugations patterns (recapitulation); complex negative patterns.
- ICML 131 Elementary Chinese I** **4 (4-0-8)**  
**Prerequisites:** -  
 Chinese phonetics (PINYIN), Chinese strokes and stroke order rules, greet people and inquire about someone's personal information (name, nationality place of study, address, telephone numbers), construct question sentences using basic questions words, place orders at restaurant, inquire about prices of things, numbers from 0-10,000, measure words, write 200 Chinese characters.
- ICML 132 Elementary Chinese II** **4 (4-0-8)**  
**Prerequisites:** ICML 131  
 Introduce oneself and one's family, inquire about someone's daily activities and hobbies, enquire about an amount of something using 几 or 多少, tell time and date, tell directions, interrogative form: 还是, 呢, reduplication of verbs, write 200 Chinese characters.
- ICML 133 Elementary Chinese III** **4 (4-0-8)**  
**Prerequisites:** ICML 132  
 Modal verbs, complement of state, modal particle “了”, complement of result and complement of duration, complex sentences and comparative sentences, write 200 Chinese characters.

- ICML 141 Elementary Spanish I** **4 (4-0-8)**  
**Prerequisites:** -  
 Basic personal information; conjugate verbs (present tense); verbs ser, tener and llamarse; gender; alphabet; count from 0 to 100; places and countries; express existence; verbs talk about location; verbs hay and estar; prepositions a, con de, por and para.
- ICML 142 Elementary Spanish II** **4 (4-0-8)**  
**Prerequisites:** ICML 141  
 Objects, colors, and clothes, preference, interests and appearance, habits and express frequency, tell the time, in a restaurant; information about food; conjugation in present of some irregular verbs; verb gustar; articles el, la, los, las; count from 100; pronominal verbs.
- ICML 143 Elementary Spanish III** **4 (4-0-8)**  
**Prerequisites:** ICML 142  
 Towns, quarters and cities; directions; past experience; present perfect tense, past tense indefinido; verbs ser, estar and hay; vocabulary of places; time markers for past tense; verbs empezar a+ infinitive; verbs ir / irse.
- ICML 160 Introduction to Thai Language and Culture** **4 (4-0-8)**  
**Prerequisites:** -  
 Vocabulary and structures for various communicative situations in everyday use and introduce basic aspects of Thai culture.
- ICML 161 Elementary Thai I** **4 (4-0-8)**  
**Prerequisites:** -  
 Greeting and introducing oneself, talking about one's family, counting from 0 – 9,999, place names and locations, various types of transport, talking about price, sizes and colors, asking for bargain, telling the time (day time) and days of the weeks, Thai consonants, long vowels placed before, after, above, and below initial consonants and corresponding short vowels, reading short sentences.
- ICML 162 Elementary Thai II** **4 (4-0-8)**  
**Prerequisites:** ICML 161  
 Telling the time (night time) and duration of time, making appointments, ordering food and drinks, making special requests when ordering food and drinks, telling the date, buying different types of tickets, departure and arrival time, the first six months of the year, different regions of Thailand, vowels placed around initial consonants, special vowels ิ-ร, ิ-ย, etc., consonant clusters, “ห” followed by unpaired low consonants, tone marks, unwritten vowels, 20 words written with ไ-, special spelling rules and exceptions อัยำ อัย อัยำ อัยาก, writing short sentences and reading short paragraphs.
- ICML 163 Elementary Thai III** **4 (4-0-8)**  
**Prerequisites:** ICML 162  
 Last six months of the year, making hotel reservations and checking in, symptoms of illness, different sections in a hospital, seasons and weather, Thai ways of life by the river, new year celebration in different cultures, reading text on life in a Thai house by the canal, visiting a temple, Thai new year, Chinese new year, and Christmas celebration in Thailand, writing short paragraphs.
- ICML 171 Elementary Indonesian I** **4 (4-0-8)**  
**Prerequisites:** -  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level.
- ICML 172 Elementary Indonesian II** **4 (4-0-8)**  
**Prerequisites:** ICML 171  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 1 – ICML 171.



- ICML 173 Elementary Indonesian III** 4 (4-0-8)  
**Prerequisites:** ICML 172  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 2 – ICML 172.
- ICML 181 Elementary Burmese I** 4 (4-0-8)  
**Prerequisites:** -  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level.
- ICML 182 Elementary Burmese II** 4 (4-0-8)  
**Prerequisites:** ICML 181  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 1 – ICML 181.
- ICML 183 Elementary Burmese III** 4 (4-0-8)  
**Prerequisites:** ICML 182  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 2 – ICML 182.
- ICML 191 Elementary Cambodian I** 4 (4-0-8)  
**Prerequisites:** -  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level.
- ICML 192 Elementary Cambodian II** 4 (4-0-8)  
**Prerequisites:** ICML 191  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 1 – ICML 191.
- ICML 193 Elementary Cambodian III** 4 (4-0-8)  
**Prerequisites:** ICML 192  
 Elements of fundamental grammar and basic vocabulary allowing students to express, request, and understand basic information, read simple short texts, and write at a simple - sentence level. Continuation of level 2 – ICML 192.
- ICNS 015 Refresher Mathematics** 0 (4-0-0)  
**Prerequisites:** Placement test  
 Real Numbers, Exponents and Radicals, Operations with real numbers and algebraic expressions, Factoring, Fractions, Linear and Quadratic equations, Linear Inequalities, Applications of Equations and Inequalities, Absolute Value, Functions and their graphs.
- ICNS 100 Intensive Mathematics** 0 (4-0-0)  
**Prerequisites:** Placement test or ICNS 015  
 Lines, linear functions, quadratic functions, systems of linear equations, nonlinear systems, exponential and logarithmic functions, exponential and logarithmic equations, matrices, matrix addition and scalar multiplication, matrix multiplication, matrix reduction, inverses of matrices, determinants, Cramer's rule.
- ICNS 101 Introduction to Mathematics** 4 (4-0-8)  
**Prerequisites:** Placement test or ICNS 100  
 Limit and continuity, introduction to differential and integral calculus with applications.

- ICNS 105 Basic Mathematics** 4 (4-0-8)  
**Prerequisites:** -  
Whole numbers, introduction to algebra, integers, rational numbers, decimals, operations with real numbers, solving equations, applying, inequalities, solving inequalities, powers and polynomials, factoring polynomials, rational expressions, ratio and proportion, percent, rectangular coordinate system, basic geometry, statistics and graphs, probability.
- ICNS 111 Fundamental Biology** 4 (4-0-8)  
**Prerequisites:** -  
Principles and methods of biology with a focus on aspects directly relevant to human life, society and the economy; chemical and cellular basis of life, including development and metabolism, the origin, evolution, diversity and interdependence of life, and areas of topical importance including genetic technology, medicine and environmental awareness.
- ICNS 112 Integrated Biology** 4 (4-0-8)  
**Prerequisites:** -  
Diversity and development of life; origin of life; cell; energy transformation; genetics; natural selection and evolution; ecology awareness.
- ICNS 114 The Science of the Human Body** 4 (4-0-8)  
**Prerequisites:** -  
Basic structure of a cell, the immune system, and several bodily systems; basic look into how several of the primary functions operate, such as tissue structure, endocrine system, respiration, digestion, reproduction, the nervous system, and the sense organs.
- ICNS 115 Hominid Evolution and Primate Society** 4 (4-0-8)  
**Prerequisites:** -  
The origins and evolution of the hominids, to natural selection, and to the study of non-human primate societies within the evolutionary framework; origins of human species, examining the origins of some of the more important physical and behavioral traits that distinguish humans from other non-human mammalian relatives; the biological and behavioral characteristics of human and nonhuman primates both extinct and extant.
- ICNS 116 Mushrooms, Molds and Mankind** 4 (4-0-8)  
**Prerequisites:** -  
How fungi, people and societies interact; industrial applications of fungi using relevant scientific information and techniques; identification of various fungi, mostly mushrooms, will also be included.
- ICNS 117 Plants, People, and Society** 4 (4-0-8)  
**Prerequisites:** -  
How people and societies interact with the plant and fungal worlds; differences among cultures and the indigenous uses of medicinal, textile and food plants; the benefits, problems and social implications of their use.
- ICNS 121 Fundamental Chemistry** 4 (4-0-8)  
**Prerequisites:** -  
Enables students to understand basic reactions at the atomic and molecular level and their use in common processes such as in industry and manufacturing. Students will attain better understanding of how science in general and chemistry in particular helps us understand and develop our world and solve problems.
- ICNS 122 Principles of Chemistry** 4 (4-0-8)  
**Prerequisites:** -  
Atomic structure, chemical bonding, gases, solids and liquid solutions, stoichiometry, chemical equilibria, ionic equilibria, periodic properties of representative and transition elements.

- ICNS 131 Fundamental Physics** 4 (4-0-8)  
**Prerequisites:** -  
Basic concepts of physics that impact individuals and society on a daily basis: physical quantities, Newtonian mechanics and dynamics, energy and heat, electricity and magnetism, light and sound, and the electromagnetic spectrum.
- ICNS 132 Principles of Physics** 4 (4-0-8)  
**Prerequisites:** -  
Measurement, units and dimensions; vectors; description of motion; Newton's Laws of Motion; work: kinetic energy, potential energy, conservation of energy; linear momentum and it's Law of the Conservation; equilibrium and elasticity; periodic motion; one dimensional wave motion; sound and hearing; hydrostatics; heat and thermal properties of mater; electricity and magnetism; geometrical optics; nuclear physics.
- ICNS 133 Introduction to Astronomy** 4 (3-2-7)  
**Prerequisites:** -  
Basic ideas of astronomy, astrophysics and cosmology; the progress of human understanding of the universe; the impact of scientific method on astronomical observation; the Earth & the Moon; the Solar System; the lifecycle of stars; Black Holes; galaxies; and the current understandings about the origins and future of the universe.
- ICNS 141 Computer Essentials** 4 (3-2-7)  
**Prerequisites:** -  
Skills and knowledge to interact and learn in a digital environment more effectively on a personal level; hands-on experience with commonly used software packages and operating systems, computer security.
- ICNS 142 Introduction to Internet Technology** 4 (3-2-7)  
**Prerequisites:** -  
Characteristics and types of communication technologies commonly used on the Internet; Internet standards and technology; the uses of online services; basic HTML; basic scripting in JavaScript.
- ICNS 143 Fundamental of Computer Science** 4 (4-0-8)  
**Prerequisites:** -  
History of computer science; algorithms in theory and practice; binary numbers, Boolean logic, and gates; an introduction to computer organization and system software, such as operating systems; basic networking concepts and information security; high-level language programming. Real world examples of computer science applications will be examined, such as using data structures to enable spellcheckers; artificial intelligence in search engines and navigation systems; and creating computer graphics for entertainment media.
- ICNS 152 Southeast Asian Ecology** 4 (3-2-7)  
**Prerequisites:** -  
Overview of the ecological systems of Southeast Asia, and discusses the current impacts and potential threats to the ecosystems; the protected area system and its role in protecting intact ecosystems, in the conservation of biological diversity, in providing ecological services, and as a key component of ecotourism; relationship between ecosystem protection and sustainable development, and the international conventions that relate to ecosystem protection; ecofriendly guidelines for developers and planners.
- ICNS 153 Ecosystems and Natural Resources** 4 (3-2-7)  
**Prerequisites:** -  
Human impacts on ecosystems and natural resources; structure, function and diversity of global ecosystems, ecosystem valuation and management, and threats to ecosystem function including climate change, pollution and extinction; scientific approaches to investigation of the causes and potential solutions of threats to ecosystems are discussed. A day trip for direct observation and study of ecosystem function and management is required.

- ICNS 154 Science, Technology and Environment** 4 (4-0-8)  
**Prerequisites:** -  
Progress of science and technology and its impact on humans and the environment; technology's ability to improve the quality of life; modification of natural systems to achieve human benefits; propagation of plants; ramification of food production; new energy sources; their effects on the environment, such as CFC in aerosol and ozone depletion, nuclear power plants, disposal and treatment of waste materials from industry, and environmental conservation.
- ICNS 161 General Geology** 4 (3-2-7)  
**Prerequisites:** -  
Introducing fundamental concepts and applications of general geology at a beginning level. Basic concepts of physical geology, emphasizing surficial and deep earth processes, including rock formation, plate tectonics, weathering and erosion, formation of landscapes, and crustal deformation
- ICNS 171 The Scientific Approach and Society** 4 (3-2-7)  
**Prerequisites:** -  
An examination of the scientific method through the work and ideas of outstanding scientific thinkers, the process of scientific reasoning and theory building, the impact of science on society.
- ICNS 211 The Science of Food** 4 (4-0-8)  
**Prerequisites:** -  
Most significant types of foods, their chemical, biochemical, physical properties and microbiological nature; overview of food production and distribution chain from raw material utilization, processing, preservation to finished products, storage and distribution.
- ICNS 212 Essentials of the Food Industry** 4 (4-0-8)  
**Prerequisites:** -  
The basic concepts of basic and applied science that are fundamental to the food industry. Scientific perspectives on food production, from ingredient sourcing, product development and processing, through to waste management. Food marketing, food policy and environmental sustainability are also explored through case studies.
- ICNS 255 Essentials of Marine Life** 4 (3-2-7)  
**Prerequisites:** -  
The natural history of marine organisms, exclusive of protozoa and insects. Types of environment in the ocean, with special reference to shallow tropical seas. The relation of biological distributions to the physical and chemical environment. The effects of environmental change. The application of ecological techniques to local problems. Field surveys with laboratory exercises are included.
- ICNS 256 Sustainable Development** 4 (4-0-8)  
**Prerequisites:** -  
Sustainable development; guiding principles and approaches; 1972 Stockholm Earth Summit; 1992 Rio Earth Summit; Agenda 21; 2002 Johannesburg World Summit; outcomes of the summits; the role of UN agencies, NGOs, governments, businesses and individuals; industry and farming and the environment; population; poverty and inequality; food and agriculture; corporate social responsibility and the International Organization for Standardization.
- ICNS 257 Environmental Issues: past, present and future** 4 (4-0-8)  
**Prerequisites:** -  
An in-depth study of environmental issues e.g. Exxon Valdez and other oil spills; Bhopal and other chemical leaks; Chernobyl and other radiation leaks; ozone depletion; global warming; loss of biodiversity; deforestation; genetic engineering and GMOs; water issues; urban issues; includes contemporary and likely future environmental issues.
- ICPE 101 Physical Education: Badminton** 1 (0-2-1)  
**Prerequisites:** -  
History, value, rules and regulations of badminton; practicing individual and team playing skills.

<p><b>ICPE 102 Physical Education: Basketball</b></p> <p><b>Prerequisites:</b> -</p> <p>History, value, rules and regulations of basketball; practicing individual and team playing skills.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 103 Physical Education: Golf</b></p> <p><b>Prerequisites:</b> -</p> <p>History, value, rules and regulations of golf; practicing the basics playing skills.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 105 Physical Education: Swimming</b></p> <p><b>Prerequisites:</b> -</p> <p>Value, rules and regulations of swimming, with an emphasis on water safety; practicing various swimming strokes.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 106 Physical Education: Tennis</b></p> <p><b>Prerequisites:</b> -</p> <p>History, value, rules and regulations of tennis; practice the basics of serving and hitting movements and other playing skills.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 107 Physical Education: Volleyball</b></p> <p><b>Prerequisites:</b> -</p> <p>History, value, rules and regulations of volleyball; practicing individual and team playing skills.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 109 Physical Education: Social Dance</b></p> <p><b>Prerequisites:</b> -</p> <p>History Values of social dance; practicing basic movements as well as figures and skills of ballroom dancing.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 113 Physical Education: Modern Dance</b></p> <p><b>Prerequisites:</b> -</p> <p>Demonstration, discussion, and practice of international forms of modern dance; comparison of modern dance with classical ballet.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 115 Self Defense</b></p> <p><b>Prerequisites:</b> -</p> <p>Non-violent self-defense course, providing students with self-confidence and skills in assault situations; practical exercises focus on skills needed in different conditions.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 117 Physical Education: Mind and Body</b></p> <p><b>Prerequisites:</b> -</p> <p>History, value, rules and regulations of Yoga; practicing individual skills.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 118 Physical Education: American Flag Football</b></p> <p><b>Prerequisites:</b> -</p> <p>A non-contact version of American football; basic fundamentals of running and jumping through an aerobic exercise; honing of hand-eye co-ordination, and building of locomotive skills, as well as developing a variety of strategies of attacking or defending against an opponent.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 121 Physical Education: Soccer</b></p> <p><b>Prerequisites:</b> -</p> <p>Theory and practice of the game including individual and team participation.</p>	<p><b>1 (0-2-1)</b></p>
<p><b>ICPE 123 Physical Education: Cycling</b></p> <p><b>Prerequisites:</b> -</p> <p>History, value, and regulations of cycling; practicing safe and efficient riding skills.</p>	<p><b>1 (0-2-1)</b></p>

<b>ICPE 124 Selected Topics in Sports</b>	<b>1 (0-2-1)</b>
<b>Prerequisites:</b> - History, value, rules and regulations of selected recreational and spectator sports.	
<b>ICPY 101 Physics I</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> - Measurement, units and dimensions; vectors; linear motion; Newton's laws of motion; rotational motion; energy, momentum, static equilibrium, fluid mechanics	
<b>ICPY 102 Physics II</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICPY 101 Physics I Oscillations and wave; light and sound; Thermodynamics; electricity and magnetism; Modern Physics	
<b>ICPY 105 Integrated Laboratory in Physics I</b>	<b>2 (0-4-2)</b>
<b>Prerequisites:</b> ICPY 101 Physics I Lab practice on measurement and uncertainty, propagation of errors, and data analysis for Newton's laws of motion; refraction and diffraction; heat transfer	
<b>ICPY 200 Modern Physics</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICPY 101 Physics I Modern physics; special theory of relativity, quantum theory, the uncertainty principle, wave and particle duality; Schrodinger's equation, atomic and nuclear theories, nuclear instability and decay, Bohr's picture of atom	
<b>ICPY 221 Computer Programming for Physics</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> ICMA 106 Calculus I Fundamental principles of computer programs; basic three programming constructs, namely sequence, conditions, and iterations; logic of programs in the problem-solving process; object-oriented programming fundamentals	
<b>ICPY 231 Mathematical Methods for Physics IA</b>	<b>2 (2-0-4)</b>
<b>Prerequisites:</b> - ICMA 213 Calculus II Vector, dot product, cross product, parametric equations, plane, surface in 3D, arc length, partial derivative, tangent plane	
<b>ICPY 232 Mathematical Methods for Physics IB</b>	<b>2 (2-0-4)</b>
<b>Prerequisites:</b> - Linear equations, system of linear equations, matrices, Euclidean spaces, traces, determinants	
<b>ICPY 233 Mathematical Methods for Physics IIA</b>	<b>2 (2-0-4)</b>
<b>Prerequisites:</b> ICMA 213 Calculus II Lagrange multipliers, double integrals, triple integrals, line integrals, Green's Theorem, surface integrals	
<b>ICPY 234 Mathematical Methods for Physics IIB</b>	<b>2 (2-0-4)</b>
<b>Prerequisites:</b> - General vector spaces, linear transformations, eigenvalues and eigenvectors, Inner product spaces	
<b>ICPY 309 Scientific Research and Presentation</b>	<b>4 (4-0-8)</b>
<b>Prerequisites:</b> - Scientific discovery methods in chemistry, computer science, mathematics and physics; hypothesis and proofs; literature search; written presentations, papers and journals; public presentations and format	

<p><b>ICPY 321 Intermediate Mechanics</b></p> <p><b>Prerequisites:</b> ICPY 101 Physics I</p> <p>Newton's laws, linear and rotational dynamics, Euler angles and rigid body dynamics, small oscillation</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICPY 322 Electricity and Magnetism</b></p> <p><b>Prerequisites:</b> ICPY 102 Physics II</p> <p>The Coulomb force, electric fields and potential, Gauss' law, dielectrics, the Biot-Savary law, Ampere's law, magnetic field and magnetic induction, vector and scalar potential, Faraday's law</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICPY 323 Electrodynamics</b></p> <p><b>Prerequisites:</b> ICPY 322 Electricity and Magnetism</p> <p>Maxwell's equation, Wave equations, Field, Guided wave, Resonance cavity, , radiation from dipoles and moving charges</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICPY 324 Wave and Optics</b></p> <p><b>Prerequisites:</b> ICPY 102 Physics II</p> <p>Wave and vibration, mechanical wave, reflection and refraction, geometric optics, Maxwell's equations, EM waves, guided</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICPY 333 Mathematical Methods in Physics III</b></p> <p><b>Prerequisites-</b></p> <p>Heat equation, method of separation of variables, Fourier series, wave equation, Laplace's equation</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICPY 334 Numerical Methods in Physics</b></p> <p><b>Prerequisites:</b> ICPY 221 Computer Programming for Physics, ICMA 213 Calculus II</p> <p>Taylor's Theorem, Numerical Derivative and Integral, Least Square Fitting, Solving System of Linear and Non-linear Equation Numerically, Optimization, Monte Carlo Simulations</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICPY 342 Integrated Laboratory in Physics II</b></p> <p><b>Prerequisites:</b> -</p> <p>Measurements and propagation of errors, how to prove phenomena predicted by mathematical models, experiments in electricity and Magnetism</p>	<p><b>2 (0-4-2)</b></p>
<p><b>ICPY 343 Integrated Laboratory in Physics III</b></p> <p><b>Prerequisites:</b> -</p> <p>Measurements and propagation of errors, how to prove phenomena predicted by mathematical models, data acquisition and data analysis, frequency discriminator</p>	<p><b>2 (0-4-2)</b></p>
<p><b>ICPY 355 Special Topics in Physics I</b></p> <p><b>Prerequisites:</b> -</p> <p>Topics of current interest</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICPY 356 Special Topics in Physics II</b></p> <p><b>Prerequisites:</b> -</p> <p>Topics of current interest</p>	<p><b>4 (4-0-8)</b></p>
<p><b>ICPY 357 Special Topics in Laboratory Physics I</b></p> <p><b>Prerequisites:</b> -</p> <p>Topics of current interest</p>	<p><b>4 (3-2-7)</b></p>

- ICPY 361 Quantum Mechanics I** 4 (4-0-8)  
**Prerequisites:** ICPY 102 Physics II  
 The development of quantum mechanics theory, Schrodinger's equation, uncertainty principle, statistical interpretation, wave function, momentum operator, Hermitian operators, infinite square well, harmonic oscillator, free particle, delta function potential, finite square well, observables, commutator, Hilbert space, eigenfunctions and Dirac notation
- ICPY 371 Thermal Physics** 4 (4-0-8)  
**Prerequisites:** -  
 The laws of thermodynamics, heat engines, entropy, axiomatic formulation of thermodynamics
- ICPY 441 Senior Project in Physics** 6 (0-12-6)  
**Prerequisites:** -  
 A student (individual or in group) perform a set of experiments with emphasis on building theoretical understanding and becoming competent in data analysis and report writing
- ICPY 451 Analytical Mechanics** 4 (4-0-8)  
**Prerequisites:** ICPY 321 Intermediate Mechanics  
 Lagrangian mechanics, minimum action principle, constraints, constraint forces and constraint dynamics; D'Alembert's principle, generalized potentials, Hamiltonian mechanics; theory of small oscillations; rotating coordinate system and rigid body, Euler angles, Coriolis effect
- ICPY 452 Statistical Mechanics** 4 (4-0-8)  
**Co-requisite:** ICPY 361 Quantum Mechanics I  
 Statistical physics, distributions and probability, Boltzmann's factor, partition and grand partition functions, Ising's model, quantum statistics
- ICPY 455 Special Topics in Physics III** 4 (4-0-8)  
**Prerequisites:** -  
 Topics of current interest
- ICPY 456 Special Topics in Physics IV** 4 (4-0-8)  
**Prerequisites:** -  
 Topics of current interest
- ICPY 457 Special Topics in Laboratory Physics II** 4 (3-2-7)  
**Prerequisites:** -  
 Topics of current interest
- ICPY 461 Quantum Mechanics II** 4 (4-0-8)  
**Prerequisites:** ICPY 361 Quantum Mechanics I  
 Schrodinger equation in spherical coordinates, the hydrogen atom, angular momentum, spin, identical particles, two-particle systems, quantum statistical mechanics, time-independent perturbation theory, fine structure of hydrogen, the Zeeman effect, hyperfine splitting, the variational principle
- ICPY 463 Quantum Mechanics III** 4 (4-0-8)  
**Prerequisites:** ICPY 461 Quantum Mechanics II  
 Time-independent perturbation theory, variational principle, WKB approximation, time-dependent perturbation theory, EPR Paradox, Bell's theorem, No-clone theory



- ICPY 471 Atomic and Molecular Physics** 4 (4-0-8)  
**Prerequisites:** -  
One-electron atoms, Helium atom, multi-electron atoms, structure and spectra of molecules, atomic spectroscopy methods, excitations of atoms and molecules by photons and electrons
- ICPY 472 Solid State Physics** 4 (4-0-8)  
**Prerequisites:** -  
Periodic structure and symmetries of crystals, diffraction, reciprocal lattice, chemical bonding, lattice dynamics, phonons, thermal properties, free electron gas, band theory, applications in metals and semi conduction materials
- ICPY 473 Nuclear and Particle Physics** 4 (4-0-8)  
**Prerequisites:** -  
Nuclear structure, nuclear forces, radioactive decay, nuclear reaction, fission, fusion, nuclear detection and measurement, applications of radioactivity, fundamental particles and interactions, classification by quantum numbers, isospin concept, symmetries, conservation laws, quark model
- ICPY 474 Astrophysics** 4 (4-0-8)  
**Prerequisites:** -  
Celestial mechanics, Kepler's laws of motion, Virial Theorem; Blackbody Radiation, quantization of energy, dual property of light; Telescopes, IR, UV X-Ray, gamma ray astronomy; spectra and classification of stars, Jeans density, interiors of stars, hydrostatic equilibrium, nucleosynthesis, Hertzsprung-Russell Diagram, the main sequence, stellar evolution, white dwarf, neutron stars, supernovae, and stellar black hole
- ICPY 484 Cosmology** 4 (4-0-8)  
**Prerequisites:** -  
Newtonian Cosmology, homogeneous isotropic universe, Friedmann equations, The Einstein-de Sitter model; modification due to general relativity, gravitational instability, density perturbation and evolution, nonlinear structure evolution, dark matter halos; the cosmic microwave background and measurement, the beginning of the universe, cosmological parameters and dark energy
- ICPY 486 Observational Astronomy** 4 (4-0-8)  
**Prerequisites:** -  
An overview of observational techniques used in Astronomy; basic techniques for obtaining and analyzing data from modern optical instruments, geometrical optics, optical design and instrumentation
- ICPY 487 Data Analysis in Astronomy** 4 (4-0-8)  
**Prerequisites:** -  
Types of Astronomical data, basic statistics and sources of error, basic computer programming (C++, Python, IDL, SQL, etc.), data acquisition, methods used in astronomical data sets; parameter estimation and model fitting, Monte Carlo method, big data handling techniques, principal component analysis, density estimation, classification techniques and neural networks, interpretation of astronomical measurement
- ICPY 488 Special Topics in Astronomy** 4 (4-0-8)  
**Prerequisites:** -  
Current research in astronomy; topics may include: instrumental science for astronomical observation; limit and sensitivity in electromagnetic wave and gravitational wave observation
- ICPY 490 Computational Physics** 4 (4-0-8)  
**Prerequisites:** -  
Ordinary differential equations: stability, order and chaos in two- dimensional motion; boundary value and eigenvalue problems, stationary solutions of the one-dimensional Schrodinger equation; partial differential equations with different types of boundary conditions: the time-dependent Schrodinger equation, heat transfer, diffusion, wave, and Laplace equation; Monte Carlo methods: the Ising model in two dimensions; Discrete Fourier Transform and Fast Fourier Transform; diffraction, image processing

- ICPY 492 Electronics** 4 (4-0-8)  
**Prerequisites:** ICPY 102 Physics II  
 Microcontroller and programming, a circuit design and analysis, electrical Components, networking, and analog Circuit
- ICPY 496 Biophysics** 4 (4-0-8)  
**Prerequisites:** ICBI 101 Biology  
 An introduction to biophysics, physical methods in the study of biological systems, including molecular and cellular biology, mathematical modeling of biological phenomena; applications of physics to biology; instruments in biophysics
- ICSC 302 Scientific Research and Presentations** 4 (4-0-8)  
**Prerequisites:** ICBI 101 Biology, ICMA 252 Biological Statistics Laboratory  
 Scientific methods of discovery including developing a hypothesis and testing, experimentation, interpretation of the results; proper format for presenting papers in public and in a scientific forum; practical sessions and participation in scientific seminars included
- ICSO 348 Society, Politics, and Economics in Contemporary Europe** 4 (4-0-8)  
**Prerequisites:** -  
 The current situation in Europe; economic developments and trend; the growth and strength of the EU; relations between Eastern and Western Europe; ethnicity, separatism and conflict in Western Europe and the Balkans; Cyprus and the relationship between Greece and Turkey; immigration; the Pope and Catholicism.
- ICSO 283 International Cultural Studies** 4 (4-0-8)  
**Prerequisites:** -  
 Culture in the modern world; the study of symbol; how culture is defined and created; modernity, postmodernity, and technoculture; dominant and minority cultural forms; gender, sexuality and ethnicity; globalism and post-colonialism; the culture of everyday life.
- ICSS 112 Introduction to Psychology** 4 (4-0-8)  
**Prerequisites:** -  
 Human behaviour and mental functioning. The nervous system, consciousness, psychoactive drugs, sensation and perception, psychogenetics, life-span development, thinking, memory, language, conditioning and learning, motivation, personality, and stress.
- ICSS 113 Introduction to Sociology** 4 (4-0-8)  
**Prerequisites:** -  
 Humans as social beings; socialization and the sense of self; social action and interaction; social patterns and groups; culture; deviance; sociology as science; statistics and correlations; social stratification; and gender.
- ICSS 114 Introduction to Economics** 4 (4-0-8)  
**Prerequisites:** -  
 Basic principles of economics; economic valuation, scarcity, and the price mechanism; factors determining the supply of and demand for goods; factors affecting competitive markets; and international trade.
- ICSS 115 Introduction to Physical Anthropology** 4 (4-0-8)  
**Prerequisites:** -  
 The origin of human beings and special features of human race, distinctiveness, and present situation of the human species. Darwinian Theory, human evolution and cultural development, human diversity, population, and diseases.
- ICSS 116 Introduction to Political Science** 4 (4-0-8)  
**Prerequisites:** -  
 Introduction to political science and the political systems. Forms of government, the evolution of the state, political authority, the nature of citizenship, and the relationship between states in the modern world.

- ICSS 117 Introduction to Social Anthropology** 4 (4-0-8)  
**Prerequisites:** -  
An introduction to selected aspects of social anthropology; forms of society; family and kinship; ethnicity and identity; economic and political relationships; consumption and exchange; rites of passage and the life cycle; rituals, meanings, and cultural performances.
- ICSS 118 Introduction to Mass Communications** 4 (4-0-8)  
**Prerequisites:** -  
An introduction to mass communication and the mass media; the development, scope and functions of the mass media; basic mass communication theories; the role and significance of the media in relationship to the individual and society.
- ICSS 119 Introduction to International Studies** 4 (4-0-8)  
**Prerequisites:** -  
The Inter-State System and the rise of the nation-state paradigm as a basis for articulating foreign policy and conducting diplomacy; post-WW II institutions and mechanisms for organizing international relations; colonialism, anti-colonialist movements and the decolonization process; the global economy and economic development agendas; the Cold War and its legacy; the rise of non-state actors; global media and transitional information flows; contemporary debates.
- ICSS 121 Southeast Asian Studies** 4 (4-0-8)  
**Prerequisites:** -  
A general study of the Southeast Asian region: its distinctive features, geography, societies and cultures, economics, and history; the development of "Southeast Asian Studies" curriculum; an introduction to other courses on the region.
- ICSS 133 Introduction to European History** 4 (4-0-8)  
**Prerequisites:** -  
An overview of the major developments in European history up to 1945, the geography of the European continent, the legacies of Greece and Rome, the Dark Ages, the Mediaeval Period, the Renaissance and the Reformation, the Scientific Revolution and the Enlightenment, the Industrial Revolutions and the economic transformation, Nationalism and the European wars of the 19th and 20th centuries.
- ICSS 135 Introduction to Human Geography** 4 (4-0-8)  
**Prerequisites:** -  
Human way of life in relation with geographical space. Population growth and distribution. Patterns of livelihood. Agricultural and industrial locations. Disparities between rich and poor. The concept of "development". Human settlements. Communication. Regional cultural patterns. States, ethnicities, and global order.
- ICSS 136 Religious Experience and Traditions** 4 (4-0-8)  
**Prerequisites:** -  
The academic study of religions. Religious phenomena. The religious traditions of East and West. Contemporary religious developments and the modern world.
- ICSS 137 Introduction to Archaeology** 4 (4-0-8)  
**Prerequisites:** -  
History, development. The development of ancient civilizations. Contemporary archaeology. Discussions of important archaeological sites in Southeast Asia.
- ICSS 139 Tourism Geography** 4 (4-0-8)  
**Prerequisites:** -  
Geography and the importance of place; world regions: physical, political, economic, and cultural characteristics; the development of international tourism; geographical patterns of tourism and the tourism features of selected world regions.

- ICSS 202 Social Institutions** **4 (4-0-8)**  
**Prerequisites:** -  
 Basic social institutions in comparative global perspective. Socialization. Marriage and the family. Education and knowledge. Religion and culture. Media and communication. Government and administration. Politics and power. Multi-institutional politics approaches in sociology.
- ICSS 203 Globalization and the Modern World** **4 (4-0-8)**  
**Prerequisites:** -  
 The global structures and transformations of the late twentieth century; the global economy; food supply; population; diseases; environment, resources, and pollution; communications; geopolitics; national states, regional, and international organizations; minorities; the role of women; warfare and terrorism; migration and refugees; crime; culture.
- ICSS 204 World History A (c. 1400-1763)** **4 (4-0-8)**  
**Prerequisites:** -  
 Selected aspects of world history from c.1400 to c.1763, concentrating on the political and economic forces which brought the various societies of the world together and created the background for the modern world; the traditional civilizations of Asia, Europe and Africa; the gunpowder revolution; the overseas expansion of Western Europe; the development of a world economy; the emergence of Russia; absolutism and constitutionalism as forms of government; printing and the Scientific Revolution
- ICSS 205 World History B (c. 1763-1914)** **4 (4-0-8)**  
**Prerequisites:** -  
 Selected aspects of world history from c.1763 to 1914; the Industrial Revolutions and the growth of the world economy; the American and French Revolutions; Latin American independence and development; political developments in Europe and the United States: representative government, the abolition of slavery, nationalism, socialism, women's rights; imperialism and responses to it; the emergence of Japan; wars and warfare; social, scientific, medical and technological developments.
- ICSS 206 World History C (c. 1914-1945)** **4 (4-0-8)**  
**Prerequisites:** -  
 A short introduction to selected aspects of world history during the early 20th century; the two world wars; the Russian Revolutions; the development of the Soviet Union; the League of Nations and international relations during the interwar period; the American Boom of the 1920s; the Great Crash and its global impact; the rise of Fascism and Nazism; regional developments in Latin America, Asia, Africa and Australasia.
- ICSS 207 World History D (c. 1945-2000)** **4 (4-0-8)**  
**Prerequisites:** -  
 A short introduction to selected aspects of world history since World War II. The USA and the USSR as superpowers. The Cold War. The UN system. Decolonization and the 'Third World'. Major regional powers. The Soviet collapse and its repercussions. Regional conflicts in the Middle East, South Asia, and the Balkans. Economic, technological and scientific developments. The great consumer boom. OPEC and oil prices. The World Bank and IMF. The EU and other economic regionalisms. World poverty. New political movements: Civil Rights, feminism, radical Islam. Ethnic conflicts and nationalism.
- ICSS 211 Regional Geography of Southeast Asia** **4 (4-0-8)**  
**Prerequisites:** -  
 The regional geography of Southeast Asia; its physical structure, climate; human settlement; population; tradition, colonies, economy during the colonial and modern periods.
- ICSS 212 History of Southeast Asia in the Modern Period** **4 (4-0-8)**  
**Prerequisites:** -  
 An overall history of the region from the beginning of the modern colonial period through to independence; general themes such as independence, liberation, nationalism, communism, democratization and globalization.

- ICSS 213 Southeast Asian Political Systems** **4 (4-0-8)**  
**Prerequisites:** -  
 Southeast Asian nations and their political systems; constitutional concepts; government and administrative functioning; law making and enforcement.
- ICSS 214 Southeast Asian Women** **4 (4-0-8)**  
**Prerequisites:** -  
 The roles of women in the various societies of the region; social problems that pertain to women, such as divorce, abandonment, abuse, prostitution problems and legal and political participation; global perceptions of Southeast Asian women; discussions of outstanding contemporary women in the region.
- ICSS 215 Southeast Asian Religious and Cultural Traditions** **4 (4-0-8)**  
**Prerequisites:** -  
 Theravada Buddhism, Islam, and Christianity in Southeast Asia. The traditional Vietnamese religious synthesis. Religions and the impact of colonialism, nationalism, secularizing ideologies, and economic modernization. Contemporary religious developments.
- ICSS 216 Introduction to the Economics of Southeast Asia** **4 (4-0-8)**  
**Prerequisites:** -  
 The national and regional economies of Southeast Asia; agriculture; industry, finance and the service sector; the role of government; development and economic change in the post-war period; regional and international economic relations; present economic trends.
- ICSS 221 Thai Society and Thai Culture** **4 (4-0-8)**  
**Prerequisites:** -  
 Traditional Thai culture, social structure and hierarchy; interpersonal relations; krong jai; family; the role of Buddhism and animism; folk traditions (birth, life, marriage, death, etc.); the modern period; the impact of Chinese, Western and Japanese culture; business culture; the rural-urban division.
- ICSS 222 Thai History** **4 (4-0-8)**  
**Prerequisites:** -  
 An overview of Thai history and culture, the history of Thailand, the Neolithic Period, Dvaravati, Srivijaya, Lanna, Sukhothai, Ayudhaya, Thonburi, and Ratanakosin.
- ICSS 231 History of East Asia in the Modern Age** **4 (4-0-8)**  
**Prerequisites:** -  
 History of China, Japan, and Korea since the mid-19th century; traditional political and economic structures; the impact of the West; Meiji Japan; nationalism; communism; wars; contemporary economic and political structures; the role of the East Asia Region in the world.
- ICSS 232 Introduction to the Civilizations of East Asia I** **4 (4-0-8)**  
**Prerequisites:** -  
 Cultural patterns and developments in China, Japan, and Korea; the nature of tradition, East Asian world views, Confucianism, Buddhism, Daoism, Shintoism; population migrations; craftsmanship and economic and scientific development; the high arts.
- ICSS 233 Introduction to the Civilizations of East Asia II** **4 (4-0-8)**  
**Prerequisites:** -  
 An overview of East Asia from the 10th to the 19th century. From the Northern and Southern Sung to the Mongols. Changing patterns of overland and maritime trade. The Ming and Ching (Qing) dynasties. The shifting political order of pre-modern Korea up to the end of the Choson period. Developments in Japan through to the end of the Tokugawa Shogunate. Early European exploration and impact.

- ICSS 234 The History and Culture of South Asia up to c.1500** **4 (4-0-8)**  
**Prerequisites:** -  
The history and culture of the region; prehistory, the Indus Valley civilization, the settlement of the Indo- Aryans; empires and kingdoms; the Hindu traditions; the emergence of Buddhism and Jainism; the early impact of Islam; Indian influence in Southeast Asia.
- ICSS 235 The History and Culture of South Asia since c.1500** **4 (4-0-8)**  
**Prerequisites:** -  
The rise and fall of the Mughal Empire. Hindus, Muslims, and Sikhs; the rise of European influence; the British raj; social and economic transformations; movements of religious reform and protest; the independence movement; economic and political developments since 1947.
- ICSS 237 Introduction to Australasian History since 1770** **4 (4-0-8)**  
**Prerequisites:** -  
The geography of Australasia. The history of the Australasian region since the coming of the Europeans. The settlement of Australia and New Zealand. Relations with the indigenous populations. Political and economic developments from the colonial period to the present day. New Guinea. The smaller island nations and territories of the Pacific. The impact of World War II and of war in Indochina. International relations both within and beyond the region.
- ICSS 238 Africa since 1800** **4 (4-0-8)**  
**Prerequisites:** -  
The geography of Africa; pre-colonial states and societies; the impact of European colonialism; social and economic transformations; the emergence and development of independence movements; political and economic developments since independence; international relations within and beyond the region; cultural change: the relationships between the indigenous, Islamic, and Western traditions.
- ICSS 239 The Middle East Since 1800** **4 (4-0-8)**  
**Prerequisites:** -  
The geography of the Middle East; Iran, the Ottoman Empire, and North Africa in the nineteenth century; the European impact; the rise of Nationalism; political and economic developments since World War I; the founding of Israel and its consequences; the politics of petroleum; international relations within and beyond the region; religious movements and cultural change since 1800; contemporary states.
- ICSS 241 Latin America since 1800** **4 (4-0-8)**  
**Prerequisites:** -  
The geography of Latin America and the Caribbean. Spanish and Portuguese colonial societies. Revolution and independence. Subsequent political and economic developments in Mexico, Central and South America. Relations with Europe and the United States. The impact of the Cold War and the Cuban Revolution. Social and political movements. The contemporary scene. The Caribbean from the colonial period through to the present day.
- ICSS 243 North America History c. 1763-1900** **4 (4-0-8)**  
**Prerequisites:** -  
The geography of North America. The colonial situation under the British and French. The American Revolution and subsequent political developments. Territorial expansion. Slavery and the U.S. Civil War. Reconstruction and the South. Industrialization and its consequences. Immigration. The international role of the United States. The political and economic development of Canada.
- ICSS 244 North America History since 1900** **4 (4-0-8)**  
**Prerequisites:** -  
A history of North America since 1900; the impact of World War I, economic and political developments in the United States and Canada during the interwar years; social change, international relations; World War II and the Cold War, the Vietnam War; American society and politics since 1945; race relations; the Quebec independence movement and the future of Canada; the contemporary scene.

- ICSS 246 Europe History since 1945** 4 (4-0-8)  
**Prerequisites:** -  
A political and economic history of Europe since 1945. The devastation of World War II. Marshall Aid and economic recovery. The impact of the Cold War. The early development of the European Economic Community. The foreign policies of Britain, France, and Germany. The loss of empire. Internal political, social and economic developments in the major European countries. Immigration. The situation in Eastern Europe. The collapse of communism and its consequences. The European Union. The contemporary situation and future prospects.
- ICSS 247 The European Union** 4 (4-0-8)  
**Prerequisites:** -  
The development of the European Union since the end of World War II; its political institutions and legal system, the economic aspects of integration, present policies and politics; future prospects.
- ICSS 250 Introduction to History and Systems of Psychology** 4 (4-0-8)  
**Prerequisites:** 1. Proven competency in English (e.g. Grade B in ICCM 105 or equivalent)  
2. Students should have some background knowledge about Psychology such as Having taken ICSS 112.  
The historical development of psychology. Philosophical perspectives. The social and political implications of psychological perspectives.
- ICSS 251 Developmental Psychology I** 4 (4-0-8)  
**Prerequisites:** -  
The life-span perspective of individual human development from conception through infancy and childhood to adolescence; processes of physical, cognitive, and psychological growth, including language and social development; child abuse and childhood psychopathology.
- ICSS 252 Developmental Psychology II** 4 (4-0-8)  
**Prerequisites:** -  
An introduction to the life-span perspective of individual human development from adolescence through adulthood to old age. The processes of physical, cognitive, and psychological growth and change, including sexuality, adult relationships, social development, and issues related to aging.
- ICSS 253 Social Psychology** 4 (4-0-8)  
**Prerequisites:** -  
Social cognition and social perception. Attribution. Attitudes. Socialization, self-esteem and the self-concept. Social behaviour. Interpersonal attraction. Conformity and obedience. Aggression. Altruism. Group processes. Collective decision making. Leadership.
- ICSS 254 Psychological Approaches to Personality** 4 (4-0-8)  
**Prerequisites:** -  
Diverse views of human nature. The analysis of personality. Basic qualities and dispositions. Characteristic ways of behaving. Theoretical approaches to human personality. Trait theory. The determinants of behaviour. Psychodynamic and cognitive approaches.
- ICSS 255 Abnormal Psychology** 4 (4-0-8)  
**Prerequisites:** -  
The definition, assessment, and classification of abnormal behaviour. Historical approaches to the understanding and treatment of abnormal behaviour. Psychotherapies and biological treatments.
- ICSS 256 Introduction to Industrial and Organizational Psychology** 4 (4-0-8)  
**Prerequisites:** -  
Work-related attitudes. Social influences at work. Job satisfaction. Work groups. Matching workers with jobs.

- ICSS 257 Introduction to Educational Psychology** **4 (4-0-8)**  
**Prerequisites:** -  
 An introduction to the study of human learning in the educational context. Motivation. Learning mechanisms. Knowledge and intelligence. Measurement and evaluation. Teaching processes.
- ICSS 258 Introduction to Cross-Cultural Psychology** **4 (4-0-8)**  
**Prerequisites:** -  
 The role of culture in the study of behaviour. Psycho-social development, social behaviour, personality and cognition in cross-cultural perspective. Theoretical and methodological issues.
- ICSS 259 Russia and the Soviet Union up to 1825** **4 (4-0-8)**  
**Prerequisites:** -  
 The land, geography and climate of Russia. Prehistoric Russia. The Kievan Period. Mongol Rule. The rise of Muscovy. The early Romanovs. Peter I and the building of Petrograd. Westernization and modernization. Relations with the West.
- ICSS 260 Russia and the Soviet Union Since 1825** **4 (4-0-8)**  
**Prerequisites:** -  
 Society, political institutions, and economic developments from 1825 up to World War I. The 1905 Revolution. World War I and the Revolutions of 1917. The Bolshevik victory and the Civil War. Stalinism. The Great Patriotic War. The Cold War and international relations. Khrushchev and the end of Stalinism. The age of Brezhnev. Social and economic developments. The end of the USSR.
- ICSS 271 An Introduction to International Relations** **4 (4-0-8)**  
**Prerequisites:** -  
 The principles and practice of international relations, with particular reference to the modern world; the bases of international power and interstate competition; inequalities among states, including domination and colonialism; war and conflict resolution among great powers; the role of trade, defence policies, and control over scarce resources; the involvement of non-state players, including international organizations and special interest groups; international issues concerning the treatment of minority groups, human rights, the use of the environment, international crime, and terrorism.
- ICSS 272 An Introduction to Comparative Political Systems** **4 (4-0-8)**  
**Prerequisites:** -  
 Various forms of political systems, both in theory, principle, and practice; political systems in stateless societies, traditional kingdoms and empires, absolutist states, democracies, and modern "authoritarian" and militaristic states; various forms of representation, party-political systems, elections, and decision making; the working of the executive, legislative, and judicial aspects of government and their interrelationships.
- ICSS 303 The Early History of Southeast Asia** **4 (4-0-8)**  
**Prerequisites:** -  
 Historical migrations of various peoples into the region. The introduction and impact of Hindu and Buddhist religions and culture. The role of Indic political systems and of interstate warfare. The development of trade with China. The introduction of Islam and the establishment of Muslim sultanates. The arrival and impact of the first Western traders and missionaries.
- ICSS 307 A Historical Introduction to the World Economy** **4 (4-0-8)**  
**Prerequisites:** -  
 International trade up to c.1450. The creation of a world economy in the 16thC. The Commercial Revolution and the development of capitalism up to c.1800. The Industrial Revolution and its global impact. Technology and societal transformation. Changes in the nature of industrial production and business enterprise. The economic role of primary producers. World War I, the post-war boom, and the Great Depression. Classical economics and Keynesianism. Soviet and Fascist economic experiments. World War II. Economic development and technology since 1945. International trade and finance. Multi-nationals. Globalization.



- ICSS 311 Introduction to International Politics in Southeast Asia** 4 (4-0-8)  
**Prerequisites:** -  
 Southeast Asia in the context of global politics in the period since World War II. The impact of the Cold War and its ending. The international relations of the Southeast Asian states. ASEAN.
- ICSS 312 Introduction to Ethnicity and Nationalism in Southeast Asia** 4 (4-0-8)  
**Prerequisites:** -  
 Ethnicity in relationship to language, religion, 'race', and culture. Ethnic groups in Southeast Asia. Minorities and majorities in the various Southeast Asian states. Political and cultural issues. The development of national identity.
- ICSS 315 Thai Economic History** 4 (4-0-8)  
**Prerequisites:** -  
 Economic developments and social structures in Thailand since the Sukhothai period. The modern Thai economy.
- ICSS 317 Introduction to Poverty and Rural Development in Southeast Asia** 4 (4-0-8)  
**Prerequisites:** -  
 The problems of poverty, especially in the agrarian sector; the successes and challenges of rural development and the consequences of change; comparison of the solutions and policies adopted in the various countries of the region.
- ICSS 332 Introduction to Human Rights** 4 (4-0-8)  
**Prerequisites:** -  
 The concept of human rights in philosophical, historical, and legal perspective; human rights in contemporary international law; international conventions and the United Nations; individual rights; war crimes; the protection of minorities; economic, and cultural rights.
- ICSS 334 Economic Problem in Southeast Asia** 4 (4-0-8)  
**Prerequisites:** -  
 A seminar-based study of contemporary economic problems in Southeast Asia.
- ICSS 335 SEA Arts I** 4 (4-0-8)  
**Prerequisites:** -  
 The arts and music of the various societies of the region and their development. Architecture, the fine arts, and folk traditions.
- ICSS 337 Introduction to Southeast Asian Dance and Theater** 4 (4-0-8)  
**Prerequisites:** -  
 An introduction to the traditions of dance, theatre and puppet theatre in Southeast Asia. Their characteristic features, historical background and contemporary expressions.
- ICSS 352 Topics in Social Psychology: Prosocial and Antisocial Behaviour** 4 (4-0-8)  
**Prerequisites:** -  
 The psychological and anthropological understanding of prosocial and antisocial behaviours. Altruism and helping. Aggression and violence. Theoretical approaches and debates.
- ICSS 355 Drug Use and Behavior** 4 (4-0-8)  
**Prerequisites:** -  
 The psychology of drug use and addiction. Types of psychoactive drugs, their use, and neurological impact.

- ICSS 361 Economic Geography** 4 (4-0-8)  
**Prerequisites:** -  
The basic concepts of economic geography. Physical and demographic conditions of economic activities. Spatial location in relation to agriculture, industry and other forms of economic activities. Core and periphery. Historical changes in the world economy. Economic globalization in geographical perspectives.
- ICSS 362 Introduction to Global Resources** 4 (4-0-8)  
**Prerequisites:** -  
The availability, distribution, and uses of the world's resources: food, water, land, soil, minerals, energy, fisheries, etc.; resource depletion and optimal usage; public policies, international agreements and business needs as related to the production, distribution and exchange of resources; relevant technological and scientific developments; future prospects.
- ICSS 363 Introduction to Population and Migration Issues** 4 (4-0-8)  
**Prerequisites:** -  
The basic principles of demography. Population increase and its social impact. Urbanization. The history of international migration. International agreements and conventions on travel, and the treatment of foreign nationals and workers. Contemporary issues in immigration policy worldwide. Illegal foreign workers. Refugees.
- ICSS 374 Introduction to International Organization** 4 (4-0-8)  
**Prerequisites:** -  
The development of international organizations since the 19th century; their nature, function, and purpose; contemporary global and regional international organizations (the United Nations, ILO, WTO, and the IMF; the EU, ASEAN, NAFTA, APEC, etc.); their effectiveness and future.
- ICSS 375 Introduction to Democracy as a Political System** 4 (4-0-8)  
**Prerequisites:** -  
Historical developments; the principles, practices, and processes of democracy; essential elements; criticisms, strengths, and weaknesses; alternative systems; social and cultural prerequisites for democracy; possible future developments.
- ICSS 382 Introduction to Global Media and Social Change** 4 (4-0-8)  
**Prerequisites:** -  
The development of the media as a global socializing force; the creation of a global market place; the information age; the power of the media in society and politics; the new global media culture.

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