



Mahidol University
International College

MUIC GENERAL CATALOG 2011-2013



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GENERAL

INFORMATION

| MAHIDOL UNIVERSITY MISSION STATEMENT |

The mission of Mahidol University is best summarized by the words of His Royal Highness Prince Mahidol of Songkla who stated that

“True success is not in learning but in its application for the benefit of mankind.”

This philosophy is the underlying theme present in all of the activities of the university as it endeavors to imbue graduates with the conviction that, apart from academic matters, they have a responsibility for improving the quality of life of their fellow human beings and making this world a better place in which to live.

| PHILOSOPHY |

To produce graduates who are not only knowledgeable in their chosen subject area but who have the intelligence to apply their knowledge and the humanity to use it for the benefit of humankind.

| MUIC MISSION STATEMENT |

Since its inception in 1986, the defining mission of Mahidol University International College has been to offer a science and liberal arts program, taught in English embodying the finest standards possible, to a diverse population of full-time students from Thailand and around the world. The College seeks not only to prepare students for professional careers in a wide range of fields but also to encourage them to develop a higher sense of moral purpose and social responsibility as well as personal creativity and lifetime learning, all of which are requisite for their lives as good citizens and leaders. In all these ways, Mahidol University International College aims to produce graduates who are not only intellectually trained and informed for careers, but are also prepared to meet the many challenges that societies will confront in the 21st century.

In order to realize this mission, the College has tried to develop the kind of learning environment that not only imparts knowledge to our students but also challenges and encourages them to widen their expectations and to seek both intellectual and personal excellence. Accordingly, the College has developed an educational program that balances both theoretical and practical learning. Programs in the social sciences, business and tourist management stand alongside offerings in pure and applied science. In addition to these, the College offers general educational courses in foreign languages, humanities and specialized courses designed to improve student skills with the English language. The classroom environment is interactive, encouraging discussion and critical explorations of ideas. Outside the classroom are a number of offerings in practical internship and field experiences which are of broad in scope.

The College has as its core values care, service, unity, honesty and integrity. The College faculty, staff, and program directors bring to their tasks as educators a wide range of international experience and learning that informs both their research and classroom activities alike. A strong sense of teamwork combined with a desire to advance human learning distinguishes them and provides our students with the kind of examples they need as they seek to define their own lives and personal goals.

Beyond the classroom, the College also affirms its role as a community resource center for learning and culture, both in Thailand and beyond. The College plays an active role in extending its boundaries as an educational institution, not only to its own graduates and alumni but also to the greater human community in Asia and the world.

| A 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 one years (1889-2010), 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 high standards 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, 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 enter management positions or pursue 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 exist with a number of foreign universities and colleges.



| COLLEGE ADMINISTRATORS |

EXECUTIVE STAFF

The Dean of the College is responsible for overall management, overseeing the undergraduate curricula, applying and enforcing regulations and creating new programs.

COLLEGE ADMINISTRATORS

The College is administered by the Board of Directors. The Board provides policy guidance for long-term planning and formulates control procedures.



President of Mahidol University

Clin. Prof. Piyasakol Sakolsatayadorn, M.D.



Dean

Prof. Dr. Maleeya Kruatrachue



Associate Dean for Academic Affairs

Asst. Prof. Dr. Yingyot Chiaravutthi



Associate Dean for International Affairs

Dr. Charles Windish



Associate Dean for Administration

Ms. Sumalee Visetratana



Interim Associate Dean for Planning, Research and Development

Assoc. Prof. Chavalit Wongse-ek



Assistant Dean for Administration

Ms. Somluck Lunsucheep



Assistant Dean for Academic Affairs

Ms. Udomrat Tivasub



Assistant Dean for Student Affairs

Mr. Michael Naglis



Assistant Dean for Research

Assoc.Prof. Chulathida Chomchai, M.D.



Assistant Dean for Planning

Dr. Atthapong Sakunsriprasert



Assistant Dean for Education Technology

Dr. Boonyanit Mathayomchan



Chairman of the Business Administration Division

Dr. Atthapong Sakunsriprasert



Chairman of the Humanities and Languages Division

Mr. John McNulty



Chairman of the Fine and Applied Arts Division

Asst. Prof. Dr. Surapong Lertsithichai



Chairman of the Social Science Division

Assoc. Prof. Dr. Peter R. Smith



Chairman of the Tourism and Hospitality Management

Asst. Prof. Dr. Chanin Yoopetch



Chairman of the Science Division

Asst. Prof. Dr. Pakorn Bovonsombat

| LOCATION |

MUIC is located at MU's Salaya campus. A fine suburban campus with 500 acres of managed land, including parklands and sports facilities, the Salaya Campus is the largest of the four Mahidol University campuses.

Salaya is located 20 km from the center of Bangkok and is linked to the cosmopolitan life of Thailand's capital city by a modern expressway, which makes it an idyllic location for students who want to commute on a daily basis and for those who want to live among the scenic beauty and calm of Salaya. MUIC is also close to the magnificent Buddhist Park at Buddhamonthon which ensures a safe and peaceful neighborhood.

The campus and surrounding areas provide a wealth of attractions, from Bangkok's famous shopping districts to countryside provinces such as Kanchanaburi and nearby coastal resorts such as Hua Hin. For students from outside the area, this makes Salaya both an ideal learning environment and the perfect base from which to explore the culture of Thailand.

Transport to Salaya from Bangkok is well served with regular public and air-conditioned buses plus microbus services from the PATA department store on Pinklao Road and the Faculty of Science on Rama VI Road. There is also a regular train service from Bangkok's Hua Lampong and/or Samsen stations to Salaya.

If you are driving from Bangkok, take the Boromrajchonnee Elevated Expressway toward Buddhamonthon and Nakorn Chaisri and follow the exit signs for Salaya. Follow the fly-over and Mahidol University, Salaya Campus, is situated on your left.



ADMISSION

INFORMATION

Mahidol University International College generally admits students through entrance examinations which are administered four times a year in January, May, July, and October. Interested candidates may apply during the following periods: April - May and June - July for first trimester enrollment in September; October for second trimester enrollment in January; January for third trimester enrollment in April.

| APPLICATION SCHEDULE |

TRIMESTER	MONTH OF ENROLLMENT	APPLICATION PERIOD
1 st Trimester	September	April — May or June - July
2 nd Trimester	January	October
3 rd Trimester	April	January

| REQUIREMENTS FOR ADMISSION |

Applicants must possess a secondary school (M. 6) certificate or its equivalent* as issued by the Ministry of Education, Thailand.

Applicants must demonstrate English competence: a TOEFL score of 550 or above, an IELTS (academic band) score of 6.0 or above, a SAT score of at least 1650 with math score of at least 580.

Applicants are required to sit for a written examination including English, Mathematics, General Science and Current Affairs. If they are successful with the written exam, they will be invited for an interview. All applicants must possess a clear record of good conduct and must be in good health. Disabled applicants are encouraged to apply and are ensured equal opportunities.

Note: Applicants whose English language skills are not sufficient for immediate acceptance may be advised to study in the Preparation Center (PC) for Languages and Mathematics. Applicants who successfully complete the PC requirements will be eligible for acceptance to the regular MUIC study program in the following trimester. MUIC also offers an “Intensive English Program” course for students preparing to take the college’s English Entrance Examination.

* GCSE, IGCSE, or GCE “O” level of not less than C in five subjects or a high school certificate/diploma from an accredited institution

| INTERNATIONAL STUDENT APPLICATIONS |

The Office of Admissions should receive applications from overseas students well in advance of the desired enrollment date in order to allow adequate time for processing.

Applicants from countries other than Thailand should take the following steps in seeking admission to the college:

- Applicants must meet all the admission requirements for new students.
- All the required credentials must be submitted in English.
- Submit proof of financial resources in the form of a bank statement/sponsors letter, etc.

Prior to entering Thailand, international candidates who are accepted to MUIC must obtain a letter from MUIC to be presented to the proper Thai authorities to obtain a proper non-immigrant visa. Tourist visas, which usually allow visitors to stay in Thailand for 30 to 90 days, are not appropriate. Entering Thailand without the proper visa may require you to leave the country within 30 days.

| TRANSFER STUDENT APPLICATIONS |

Students transferring from another institution must be in good standing with the institution last attended. The following steps should be taken in seeking admission to the College:

- Applicants must meet all the admission requirements for new students.
- Request that the registrar of each institution previously attended forward to MUIC an official transcript of all work completed or in progress. Failure to declare previous attendance at another institution may result in denial of admission - or dismissal.
- Obtain course descriptions (usually found in the institution's educational bulletin) or course syllabi for all courses taken from previous institution(s) to expedite the process of transferring credits.

| VISITING STUDENT APPLICATIONS |

Visiting students are individuals who are pursuing a degree from another institution but who plan to enroll at MUIC for one or more trimesters. Visiting students must submit a letter to the Dean requesting approval to take a course or courses at MUIC. The letter should specify the name and location of the home institution, credits earned, cumulative GPA and the approved courses visiting students wish to take at MUIC. A photocopy of a student identification card is required. Visiting students will have to pay the non-resident registration and tuition fees.

| CREDIT TRANSFER |

Students who have studied at the college or university level may wish to transfer credits to MUIC. The following criteria must be met in order to transfer credits for courses taken:

- The courses must have been taken no more than 3 years prior to the date of admission to MUIC.
- The courses will be eligible for transfer credits if its content matches three-fourths or more of the content of the equivalent MUIC course.
- Transfer credits should not exceed half of the total credits required for graduation.
- The student must have a minimum grade of C or its equivalent for general education courses or required major courses for which transfer credit is being requested.
- The student must have a minimum grade of B or its equivalent for core courses in the major for which transfer credits are being requested.
- The maximum number of credits transferred from a university within Thailand is 20 credit hours unless MUIC has an academic articulation agreement with that institution.

| TUITION AND FEES |

Approximate fees are as follows:

		Resident	Non-Resident
Admission fee (for 4 years)	Baht	10,000	10,000
Trimester Academic Fee (Per trimester)		8,400	8,400
Major Fee for Non-science (Per trimester)		10,000	10,000
Major Fee for Science (Per trimester)		12,000	12,000
Professional Fee for EMP (Per trimester)		38,000	38,000
Professional Fee for Communication Design (Per trimester)		25,000	25,000
Bank Fee		20	20
Bachelor of Arts Programs: (Per annum)			
- Social Science	Baht	146,700	191,700
- Entertainment Media Production (Animation, Film, and Television)	Baht	329,700	399,700
- Communication Design	Baht	294,700	366,700
Bachelor of Business Administration Programs: (Per annum)			
- Finance	Baht	149,700	196,450
- Information Systems	Baht	149,700	196,450
- International Business	Baht	149,700	196,450
- Marketing	Baht	149,700	196,450
- Business Economics	Baht	149,700	196,450
- Tourism and Hospitality Management	Baht	148,200	186,450
Bachelor of Science Programs: (Per annum)			
- Applied Mathematics	Baht	159,200	206,200
- Biological Science	Baht	160,200	199,700
- Chemistry	Baht	158,200	205,200
- Computer Science	Baht	160,200	206,700
- Environmental Science	Baht	155,200	199,700
- Food Science and Technology	Baht	163,700	210,450
- Physics	Baht	156,700	202,700
Bachelor of Engineering Program: (Per annum)			
- Computer Engineering	Baht	157,700	203,450



STUDENT

AFFAIRS

The Office of Student Affairs has four units: Student Services, Counseling Services, Disciplinary Affairs and Student Activities. *Student Services* is responsible for students' welfare. *Counseling Services* provides academic and personal counseling. *Disciplinary Affairs* monitors students who violate MUIC or Mahidol University rules and regulations. *Student Activities* encourages students to get involved in extra-curricular activities so they can better handle stress and develop human skills.

| STUDENT SERVICES |

The Student Services Unit takes care of the basic day-to-day needs of students.

| Housing |

Although commuting from areas in Bangkok to the Salaya Campus is not difficult, many students decide to live either on or close to the campus. This allows them to have more time to focus on their studies as well as to participate in extra-curricular activities.

There are many housing options available near Salaya, but because several large faculties have moved to Salaya, the demand for housing has increased as well. The Office of Student Affairs is happy to help with providing information about on and off campus housing.

| MUIC Dormitory at Green Park Home |

Green Park Home is located on Buddhamonthon 4 Road, a 10-minute drive from the campus. Priority is given to exchange students but regular students are invited to rent as well. The cost is 3,000 - 5,500 baht per month, not including electricity or water.

| Condominiums |

Three 14-storey condominiums are located near the back gate of the Salaya Campus. Each unit rents for 10,000 baht per month, not including electricity and water. Up to four people can live in each unit which includes a television set, beds, refrigerator, telephone, and other furnishings. Each unit of the condominium has two bedrooms, two bathrooms, a living room and air conditioning.

Interested students should call 02-441-9205, 02-441-9194 or contact the condominium manager in Condominium A.

| University Dormitories |

The University provides low-cost dormitories for students having financial difficulties. Preference is usually given to other Mahidol University faculties but MUIC students can apply as well.

There are four men's dormitories and four women's dormitories. They are located near the Central Facilities of the Salaya Campus. Each room can house four people. The dormitory costs 3,600 - 9,250 baht per person per semester.

Again, semesters run from June to October and November to March. The dormitories are closed during the University's summer break.

Interested students should fill out the application form at the university dormitory office, Dormitory 11 (Baan Sritrang) or call 02-441-9725.

OTHER HOUSING OPTIONS ARE AVAILABLE IN THE SALAYA AREA. THE PRICES RANGE FROM 3,500 - 6,000 BAHT PER MONTH.

| HEALTH SERVICES |

While attending MUIC, Thai students can receive health care service by applying for the University Health Insurance to the National Health Security Health Office. Students whose parents are currently working for government sectors or enterprises can receive reimbursement from their parents' workplaces until the age of 20.

MUIC students who apply for the University Health Insurance can receive services from Siriraj Hospital and Golden Jubilee Medical Centre. Prior to receiving the services, students must present their identification card and student identification card.

Students are also entitled to consultations for minor health problems from the MU Health Clinic which is located on the campus. Service hours are 08:30 - 16:30 hrs, from Monday to Friday. MUIC operates a First Aid Center, with a part-time doctor and nurse on weekdays.

Foreign students can use the University Health Insurance at Siriraj Hospital and Golden Jubilee Medical Centre by presenting their student identification card. If they stay in a private room, they must take full responsibility for all expenses incurred.

All expenses from any hospitals other than the aforementioned will not be covered.

For more information, please contact the Office of Student Affairs at 0-2441-5090 ext. 1115, 1120

| FINANCIAL AID |

As part of the Mahidol University philosophy, the college rewards excellence in academics and contributions to society. Students who are awarded a scholarship should be outstanding students with good behavior. They should have a good academic standing and never have violated the University Code of Conduct.

There are several internal scholarships which are funded by MUIC.

MUIC Scholarship

Students who complete high school in Thailand and pass MUIC's entrance examination with the highest overall score. The scholarship covers a tuition fee waiver for 4 years. The students must maintain a cumulative GPA of 3.00 or above each trimester during the scholarship period. One scholarship will be awarded for each of the four entrance examinations each school year.

MUIC Science Scholarship (Outstanding Science Performance)

Students who complete high school in Thailand, apply for a Science Program and pass MUIC's entrance examination with the highest overall score. The scholarship covers a tuition fee waiver for 4 years. The student must maintain a cumulative GPA of 3.00 or above each trimester during the scholarship period. One scholarship will be awarded for each of the four entrance examinations each school year. Additionally, students cannot change their major, unless it is in the Science Division.

Foreign Language Ambassador Scholarship

Students who register for a minor language program and have a cumulative GPA of 3.00. Interested students can apply for this scholarship at the Humanities and Language Division.

Scholarships for students with disabilities

Students have to apply for this scholarship prior to the admission process.

MUIC Financial Aid

Students must have been registered for at least 1 year. Students should have a cumulative GPA of 2.50 and must register for at least 12 credits in the trimester. Students should strictly follow the University Code of Conduct and participate in MUIC activities. The maximum amount is 50,000 baht per scholarship. The scholarship amount depends on students' financial problems. The scholarship given will be used as a tuition fee waiver in the next trimester.

MUIC Student Activities Scholarships

Students who are selected by virtue of their Student Association positions. Students must meet the requirements of the Student Association Regulations and strictly follow the University Code of Conduct.

- 24,000 baht per year for President
 - 18,000 baht per year for Vice President
 - 12,000 baht for each Committee
- by waiving the tuition fees

Students who are selected as Mahidol University Outstanding Sportspersons. The college awards 24,000 baht per scholarship by waiving the tuition fee.

Students who win a medal in the Mahidol University games will receive a scholarship in the form of a tuition waiver as follows:

- 12 credits waiver for gold medal
- 8 credits waiver for silver medal
- 4 credits waiver for bronze medal

MUIC Young Leaders Scholarship

Students must be officially nominated by MUIC or MU to participate in an event. Events/activities must take place abroad. The scholarship covers air fare (round-trip), registration fee and per diem.

MUIC Young Ambassadors Scholarship

The college awards this scholarship to outbound MUIC students for activities, internships and research activities. A maximum of 35 scholarships is awarded each year at 50,000 baht per scholarship. Credits from abroad can be transferred.

M-I-T Mobility Scholarship

Students must have a cumulative GPA of 3.00 or above, be Thai nationals, have knowledge of Thai culture and participate in social activities. The college awards 10 scholarships per year for Business Administration students, especially International Business majors. Students will be exempt from the tuition fee, major fee and other fees.

| Student Loans |**Thai Government Loans**

Students must be Thai nationals and full-time students. The annual income of parents should not exceed 200,000 baht. The maximum amount that can be borrowed is 60,000 - 70,000 baht per year. This loan has to be repaid with interest within 2 years after graduation.

| Certificates by the Office of Academic Affairs |

The college offers certificates by the Office of Academic Affairs according to the following conditions:

- 1) For Academic Excellence in each Bachelor degree major
 - Two students with the highest cumulative GPA in each major, with at least 3.25
 - Credits must exceed 61

- 2) For General Education Course
 - Two students with the highest cumulative GPA in each major, with at least 3.25
 - Credits must be between 40 - 60

Reserve Officer Training Course

All male students of Thai nationality are required to register with the Thai military when they reach the age of 20. A citizen can register for training at an earlier age, and training courses taken in high school or at university may count toward meeting national military requirements.

MUIC Students who need to apply for the Reserve Officer Training Course (ROTC) must report to the MUIC Office of Student Affairs by the first week of their entry and must participate in training activities every Wednesday afternoon. Students who have not reported to the MUIC Office of Student Affairs within the designated period will no longer have the right to join the Reserve Officer Training Course (ROTC).

Students who request postponement of their Military Recruitment must submit the appropriate legal documents to the MUIC Office of Student Affairs during September 1 - October 31 of every year.

It is the responsibility of the students to notify lecturers in a timely fashion about military obligations. Failure to do so may affect a student's academic standing.

Lost and Found

The Office of Student Affairs takes care of lost and found items. Students who lose an item or may have had it stolen should report the loss to this department.

| COUNSELING SERVICES |

Mahidol University International College cooperates with the Galaya Rajanakarindra Institute in providing psychiatrist counseling services for MUIC students.

Service information as follows :

1. Students can contact the MUIC Office of Student Affairs to make an appointment with the Galaya Rajanakarindra Institute.
2. Students who need to contact the Galaya Rajanakarindra Institute directly can call Khun Sakorn Srisuriyawong at 0-2889-9066-7 ext. 1217 or Fax : 0-2889-9083 and make an appointment with the psychiatrist. (Students are required to pay for the services)

Galaya Rajanakarindra Institute
23 Moo 8, Buddhamonthon 4 Road,
Taweewattana, Bangkok 10170

Students seeking counseling services can contact the following for consultations:

- *Asst. Prof. Anchalee Pongpun* at icanchalee@mahidol.ac.th or make an appointment with the MUIC Office of Student Affairs at 0-2441-5090 ext. 1115, 1120, 1328
- *Ajarn Douglas Rhein* at icdouglas@mahidol.ac.th or 0-2441-5090 ext. 1755
- *MUIC Hot-line* Tel. 086-106-9944

Student Activities

A large part of the education experience can be found outside the classroom where student interact with others and are actively involved not only at the college but also in the community. By being involved, you are helping yourself and helping others.

More than Just Classes. Be Active!

It makes you stand out from the crowd. There are thousands of students graduating each year but the top-level companies are looking for leaders, those who can plan and execute projects. Our MUIC students who are active in clubs and the Student Association have first choice because they have extensive resumes.

You develop the skills to succeed. In a club you'll spend time talking with friends and listening. You are actually learning important interpersonal skills that allow you to succeed in an organization. Being able to listen makes you a better problem solver and allows you to build the long-term relationships that are important in any organization.

You learn to be confident.

Helping village children to learn English or organizing a sports competition or performing a dance routine in front of a large audience requires the best from you. It is part of the learning process, even when you make mistakes. But when you truly challenge yourself, there is nothing like the feeling when you succeed.

| STUDENT ASSOCIATION AND CLUBS |

The MUIC Student Association (MUICSA) coordinates student activities at MUIC and has three primary objectives:

- To make MUIC a place where students can excel and enjoy themselves, both academically and socially.
- To encourage as many students as possible to get involved in extra-curricular activities.
- To provide a voice for students and contribute to finding creative solution for student concerns.

The MUICSA Office is located in Room 2212, Building 2.

MUICSA STRUCTURE AND CLUBS

MUICSA is the student government for MUIC, with 23 MUICSA members, in addition to class presidents, representing the student body. They meet each week and make decisions concerning the funding of clubs, activity schedules and other such issues. Elections for the MUICSA leadership team are held each year at the end of Trimester III.

Each class has at least four representatives elected every year. These representatives are responsible for organizing specific events: the freshmen class is responsible for arranging the Thank P' Party and the Loy Krathong Festival; the sophomore class is responsible for organizing the Environmental Camp; and the junior class is responsible for organizing the MUIC graduation celebration party.

Currently MUIC has 24 student clubs with MUICSA providing oversight for each. The College funds club activities but the Student Association approves the club budgets, ensures that each club meets regularly and is active, and provides a review structure for the approval of new clubs. In order to maintain an active status, clubs must hold one meeting per month and must organize at least one activity per trimester.

MUICSA introduces clubs to new students during the Club Exposition, an event at which each club provides information and recruits prospective members. MUIC students can also join other clubs at Mahidol University. Club membership and activities may help students handle any academic stress. The activities also help students develop enduring relationships with their peers.

Students who participate in clubs will have their club membership recorded on their transcripts. Management, planning and team-building skills learned from these activities are often considered favorable by employers. Students who participate in clubs have a much stronger resume to present to companies and organizations.

List of Clubs

- Art Club
- Cheer and Dance Club
- Choir Club
- Cycling Club
- Debate Club
- Diving Club
- Drama Club
- Inner Peace Club
- Karate-Do Club
- Kendo Club
- Muay Thai Club
- Multicultural Club
- Music Club
- Nature Lovers Club
- Photography and Multi-media Club
- Public Media International Community Club
- Students in Free Enterprise Club (SIFE)
- Social Dance Club
- Science Society Club
- Strategic Games Club
- Sports Club
- Value Invertment Club
- Volunteer Club
- Young Professionals Club



ACADEMIC

AFFAIRS

| ACADEMIC SYSTEM |

The trimester system is used at Mahidol University International College. The academic calendar is made up of three trimesters, each of which runs for a period of 12 weeks and a summer session. The first trimester begins in September; the second and third trimesters begin in early January and April, respectively. The summer session consists of 4 weeks and begins in August.

| ADVISING SYSTEM |

MUIC has established an advising procedure to assist students in selecting suitable courses. All first-year students are assigned advisors who help them select courses to meet general education requirements for their anticipated majors. Once student have completed a certain number of general education courses, they are eligible to take classes in their respective majors. After being accepted by the department of their major, students may be assigned a new advisor in their field of study.

| REGISTRATION |

New students register for classes during orientation week. All other students register approximately one month before classes begin. The registration dates are stipulated in the Academic Calendar, which is available at the Office of Academic Affairs. On the registration date, students can quickly access the registration process by simply logging on to <http://oasis.muic.mahidol.ac.th>

The registration will be complete with the advisor's approval and payment of tuition fees. If a payment is overdue, students will be charged 100 baht per day (maximum charge of 1,000 baht).

| Minimum and Maximum Course Load Allowed |

The minimum course load for full-time students is 12 credit hours, including non-credit class hours. The standard course load per trimester is 16 credit hours. However, students on academic probation are limited to a course load of 12 credit hours per trimester, including non-credit class hours. Only seniors or students with a cumulative GPA of 3.0 or above may take more than 16 credit hours per trimester (the maximum course load is 22 credit hours). The maximum course load during the summer session is 8 credit hours.

| PRE-REGISTRATION |

Some programs or classes require pre-registration because some students may be given priority when registering. For example, Tourism and Hospitality Management students are required to take language classes so they are given priority when registering for these classes. To pre-register, students need to contact the appropriate program and put their names on a pre-registration list.

| ERRORS IN REGISTRATION |

Errors in registration should be corrected within the first week of instruction during a regular trimester and within the first three days of instruction for a summer session.

| LATE REGISTRATION AND ADD/DROP |

Students who do not register during the pre-registration period can register during the late registration and add/drop periods. The add/drop period consists of 2-3 working days. Students can register for classes after this period only by special permission of the Registrar and only under exceptional circumstances.

During the add/drop period, students can change their schedule once at no charge. Any subsequent changes will cost 500 baht for each request processed after the first change. Students who change their schedule due to circumstances beyond their control, such as classes being cancelled, can request an exemption from this fee from the Office of Academic Affairs.

Students who drop a class without adding a class of equal hours will be charged 10 percent of the cost of the tuition fee for the dropped class.

| COURSE WITHDRAWAL |

Students are personally responsible for dropping a course in which they no longer wish to be enrolled. Students may withdraw from a course during the add/drop period at the beginning of the trimester.

Students officially withdrawing after the add/drop period will not receive a refund and will receive a W grade for the class. Permission to withdraw from a class must be obtained from the instructor. Failure to withdraw from a class will result in a grade of F. The grade of W will not be used in calculating grade point averages, but three grades of W in the same subject will result in dismissal from the College.

Students can access the withdrawal process by simply logging on to <http://oasis.muic.mahidol.ac.th>. Students cannot allow their course load to drop below 12 credits. For example, if a student is taking four classes for a total of 16 credits, the student can withdraw from only one class. If a student is taking three classes for a total of 12 credits, the student will not be allowed to withdraw from any class.

| CHANGE OF MAJOR |

Students may request to change their major during the period specified in the Academic Calendar or by an announcement on OASIS each trimester. The change of major must be requested online and the rest of the procedures must be done prior to the end of the change of major period.

After requesting a change of major online, students have to wait until they receive notification to contact the Office of Academic Affairs. The transfer of general education and present major courses already taken will be automatically completed by the computer system. However, it is the students' responsibility to double check the computerized transfer of courses that are required by the new major. In some cases, the class required by the new major will be taught at a more advanced level, or the content will differ, so students may not be allowed to transfer the class in which they already enrolled. For instance, Tourism and Hospitality Management students may have to take ICNS 102 Principles of Mathematics when changing to a Biological Science major even though that student has already taken ICNS 101 Introduction to Mathematics. Freshmen must wait until the second trimester after entry before changing a major.

A fee will be charged if students change their major more than once.

| REPEATING COURSES |

Students earning a grade F, D+, or D in a course may retake that course, and the new grade will replace the original grade; however, the original grade will still appear on the transcript. For classes in the core area of a major, students must earn at least a C in order to pass.

If a student withdraws from a core or required class in the major field of study or from a general elective subject that is required for the major, the student needs to repeat that class.

| GRADING SYSTEM |

Evaluation of a student's achievement in a course is recorded by letter grades.

Grade	Achievement	GPA
A	Excellent	4.0
B+	Very Good	3.5
B	Good	3.0
C+	Fairly Good	2.5
C	Fair	2.0
D+	Poor	1.5
D	Very Poor	1.0
F	Fail	0.0

Other letter grades, without credit points, are assigned for course work taken as follows:

I	Incomplete
X	No report from the instructor
P	In progress
S	Satisfactory
U	Unsatisfactory
AU	Audit (No credit granted)
W	Withdrawal

| PROBATION |

Students whose cumulative GPA falls below 2.00 will be placed on academic probation. There are two types of probation.

- Probation Type 1 includes students with a cumulative GPA of 1.50 or higher but less than 1.80. Students have three trimesters to be removed from probation.
- Probation Type 2 includes students with a cumulative GPA of 1.80 or higher but less than 2.00. Students have six trimesters to be removed from probation.

Students will be removed from probation when the student's cumulative GPA is 2.00 or higher. Failure to achieve the minimum GPA standard during the required period will result in dismissal.

| DISMISSAL |

Students who fall into one of the following categories will be dismissed from the College:

1. Students with a cumulative GPA below 1.50 and are unable to pass two academic (4-credit-hour each) classes, including non-credit classes.
2. Students who have obtained three F grades or any combination of three W grades or F grades in one subject, including non-credit classes.
3. Students who fail three times to obtain the passing grade of C in English Communication (I-III) and major core courses.
4. Students who fail to be removed from academic probation within the allowed time.
5. Students who have committed a severe breach of the university rules and regulations that govern student conduct. This includes but is not limited to the following:
 - Plagiarism
 - Cheating during examinations
 - Drug use
 - Damage to the university's property or reputation
 - Gambling, stealing and other criminal behavior

| GRADUATION |

In order to graduate, students must complete between 178 to 188 credits based on program requirements. Students should refer to the specific program course record for details.

All students must complete the following three areas of study:

- General education
- Major field of study
- Free electives

To graduate, students must earn a minimum grade of 2.0 or C for all core courses in a subject major and carry a minimum cumulative GPA of 2.0. The Commission on Higher Education also requires that a student study for at least three years and two trimesters before qualifying for graduation.

To graduate, students need to fill out an application to graduate before registering for their last trimester. Students who complete all course requirements by the second trimester can graduate that academic year.

| HONORS AND AWARDS |

In recognition of exceptional students, the College has an honors system. Students maintaining high scholastic cumulative GPAs are eligible to graduate with honors.

| First Class Honors |

Students will be awarded first class honors if they meet all of the following requirements:

- Earn a cumulative GPA of 3.50 or higher.
- Never receive an F or W grade for any course.
- Must not have an I grade for any course.

- Complete at least 135 credits at MUIC.
- Must never have re-graded or re-examined in any subject.
- Must not have re-graded any subject.
- Must not have transferred more than 25 percent of the total required credits from another institution with the exception of courses taken as part of MUIC's Study Abroad Program.

| **Second Class Honors** |

Students will be awarded second class honors if they meet all the above requirements but earn a cumulative GPA between 3.25 and 3.49.

| **COMMENCEMENT CEREMONY** |

Mahidol University holds its annual commencement ceremony in July. His Majesty the King or a member of the Royal Family acting on His Majesty's behalf presides over the ceremony.

To attend, graduates must register for this ceremony at the proper time, generally in early May. Registered students must take part in three rehearsals. The third rehearsal is a dress rehearsal. Graduates who miss any rehearsal will not be allowed to participate in the ceremony.



ACADEMIC PROGRAMS

| GENERAL EDUCATION COURSES |

Depending on the choice of major, students are required to complete between 178 to 188 credits for graduation from three areas of study: general education, the major field of study, and free elective courses. A minimum of a C grade is required for each of the core courses in the major field of study to be eligible for graduation. The minimum cumulative GPA for graduation is 2.0.

MUIC believes that specialized academic knowledge is given greater significance when it is pursued in a context of general studies that broadens one's horizons, creates new perspectives and deepens understanding and appreciation. To assist students in making choices from among the range of offerings, MUIC provides guidelines governing General Education, the program of study that gives liberal education its breadth. A student's program of General Education is as important as the selection of a major field and should be chosen with equal care in concert with his or her advisor.

The purpose of the General Education courses is to provide students with a wide-ranging general education. To be a good professional (doctor, food scientist, computer programmer, business person, hotel manager, etc.) requires more than technical training in the relevant skills. Nobody can be truly educated in the modern world if they do not have at least some basic understanding of modern scientific developments or of issues in the social sciences, current events, ethics and international culture. The General Education courses are designed in part to challenge our students with a wide range of such issues, as well as teach some basic skills which will have wider relevance throughout the student's career.

Central to our students' needs is a high level of English fluency. We now live in a globalizing world in which competence in written and spoken English is commonly a primary requirement for graduates seeking employment in international firms and organizations. It is also the predominant language of international business and the Internet. Again, most local students who want to study overseas for a Master's or Doctoral degree choose to study in an English-speaking country, and should be fluent in English. More basically, any student who wants to have a good knowledge of the literature in his or her specialization must now have an excellent knowledge of English.

Therefore, MUIC requires its students to take a series of courses in English Communication (at either an intermediate or advanced level, depending on English language ability).

As for the other General Education requirements, students have a fairly free choice, being able to take those courses of greatest personal interest. Exceptions are as follows:

1. All science students must take a prescribed list of Natural Science General Education courses as preparation for their more advanced work. These requirements vary from one major to another. Details are given to new students when they register.
2. All students must take a basic course in either Philosophy or Logic or Moral and Ethical Studies or Asian Philosophy or European Enlightenment or Critical Thinking or Western Classical Ideal.

3. Students who choose to study a language as part of their General Education must take at least two courses in that language.

| **REGULAR TRACK** |

GENERAL EDUCATION	48-60	CREDITS
- English Communication	16	credits
- Natural Sciences	8-16	credits
- Humanities	12	credits
- Social Sciences	8-12	credits
- Health Science and Physical Education	3-4	credits
MAJOR FIELD OF STUDY		
(EITHER B.A., B.SC., BBA, B.ENG. OR B.N.S.)	110-124	CREDITS
FREE ELECTIVES	8	CREDITS

| **SENIOR PROJECT** |

Students are encouraged to submit a senior project. Students may elect to do interdisciplinary work as part of their required work for graduation at MUIC or off campus or at an overseas institution. The student's advisor and the program director and/or coordinator must approve senior projects.

| **INTERNSHIP AND DIRECTED RESEARCH** |

Students in some majors are eligible to take an academic internship and expand it into a seminar project or directed research. Students who wish to do so must receive approval from the Chairman of the Division before undertaking such activities.



**MAHIDOL
UNIVERSITY**
Wisdom of the Land

International College



BUSINESS ADMINISTRATION DIVISION

The Business Administration Division offers 5 principal programs leading to a Bachelor of Business Administration Degree in a specific major. The current majors available are Business Economics, Finance, Information Systems, International Business, and Marketing. All Students in these five majors are required to participate in either Directed Research or Off-Campus or On-Campus Practical Business Training.

| DIVISION CHAIRMAN |

Dr. Atthapong Sakunsriprasert, Ph.D. (Development Administration, National Institute of Development Administration, Thailand), M.B.A. (Finance, National Institute of Development Administration, Thailand), M.Bus (Marketing, University of Technology, Australia), M.M. (General Management, Mahidol University, Thailand), B.B.A. (International Business Management, Assumption University, Thailand)

| DIVISION PROGRAM DIRECTORS |

| Business Economics Major |

Dr. Pandej Chintrakarn, Ph.D. (Economics, Southern Methodist University, Texas, U.S.A.), M.S. (Economics, Texas A&M University, College Station, Texas, U.S.A.), M.S. (Economics Research, University of North Texas, U.S.A.), B.A. (Economics, Thammasat University, Thailand)

| Finance Major |

Dr. Jun Jiang, Ph.D. (Financial Economics, National Institute of Development Administration, Thailand), M.B.A. (General Management, Assumption University, Thailand), B.A. (Accounting, Soochow University, China)

| Information System Major |

Mr. Veera Bhatiasavi, Ph.D. Candidate (Management of Technology, Asian Institute of Technology, Thailand), M.Sc. (Information System, Hawaii Pacific University, U.S.A.), B.S. (Computer Science, Hawaii Pacific University, Hawaii U.S.A.)

| International Business Major |

Dr. Chairawee Anamthawat-Kierig, Ph.D. (Marketing, Thammasat University, Thailand), EM.B.A. (International Business and Marketing, SASIN of Chulalongkorn University, Thailand), B.A. (Economics, Chulalongkorn University, Thailand)

| Marketing Major |

Ms. Chompunuch Pongjit, Ph.D. Candidate (Marketing, Asian Institute of Technology, Thailand), M.B.A. (Marketing, Willamette University, Oregon, U.S.A.), B.S. (Business Administration, Western Oregon University, U.S.A.)

| **MBA Program in Business Modeling and Analysis** |

Dr. Ornlatcha Sivarak, Ph.D. (Management Science, Illinois Institute of Technology, U.S.A.), M.S. (Management Information System, University of Illinois at Chicago, U.S.A.), M.B.A. (International Business, Western Michigan University, U.S.A.), B.Ed. (Early Childhood Education, Chulalongkorn University, Thailand)

| **FACULTY MEMBERS** |

| **Full-Time** |

Assistant Professor Yingyot Chiaravutthi, Ph.D. (Economics, University of South Carolina, U.S.A.), M.B.A. (Finance, Hawaii Pacific University, U.S.A.), B.B.A. (General Management, Assumption University, Thailand)

Dr. Benjalux Sakunasingha, D.B.A. (Performance Measurement, Southern Cross University, Australia), M.B.A. (Finance, California State University, U.S.A.), B.Sc. (Biology, Mahidol University (International Student Degree Program), Thailand)

Dr. Dissatat Prasertsakul, D.B.A. (Marketing & Strategic Management, University of Newcastle-NSW, Australia), M.A. (Business & Managerial Economics, International Program, Chulalongkorn University, Thailand), B.B.A. (General Management, Assumption University, Thailand)

Dr. Dolchai La-ornual, Ph.D. (Management (Decision Sciences), INSEAD, France), M.S. (Engineering-Economic Systems and Operations Research, Stanford University, U.S.A.), M.S.E. (Industrial and Operations Engineering, University of Michigan, U.S.A.), B.S.E. (Mechanical Engineering and Materials Science, Duke University, U.S.A.)

Dr. Malinvisa Sakdiyakorn, Ph.D. (Development Administration, National Institute of Development Administration, Thailand), M.Sc. (International Employment Relations and Human Resource Management, London School of Economics and Political Science, United Kingdom), M.A. (European Studies, Chulalongkorn University, Thailand), B.A. (English, Chulalongkorn University, Thailand)

Dr. Nuntana Udomkit, Ph.D. (Economics and International Development, University of Bath, United Kingdom), M.A. (Economy and Society, Lancaster University, United Kingdom), B.A. (Public Administration, Chiang Mai University, Thailand)

Mr. Sean Gallagher, Ph.D. Candidate (Management, University of South Australia, Australia), M.A.B.P. (University of South Australia, Australia), M.B.A. (Heriot-Watt University, United Kingdom), B.A.S. (Administrative Studies, Trent University, Canada)

Mr. Barry John Clements, Post Graduate Certificate (Business Education, Garnet Teacher Training College, U.K.), B.A. (Accounting/Law, University of Kent, U.K.)

Ms. Kandapa Thanasuta, M.B.A. (Marketing and Finance, Sasin Graduate Institute of Business Administration, Thailand), B.Sc. (International Business, Georgetown College, U.S.A.)

Ms. Kurniati Ailing Wirakotan, M.B.A. (General Management, Griffith University, Australia), B.Ed. (Educational Psychology, Atma Jaya Catholic University, Indonesia)

Mr. Rattakarn Komonrat, M.A. (International Economics Relation, University of Konstanz, Germany), B.A. (International Business Management, Mahidol University International College, Thailand)

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Ms. Thanyawee Pratoomsuwan, M.Comm. (Accounting and Finance, University of Sydney, Australia), B.A. (Finance, Mahidol University International College, Thailand)

Ms. Varvisa Chaimahawong, M.Comm. (Finance, University of New South Wales, Australia), B.A. (Finance, Mahidol University International College, Thailand)

|Part-Time|

Asst. Prof. Sittisak Leelahanon, Ph.D. (Mathematics, Mahidol University, Thailand), Ph.D. (Economics, Texas A&M University, U.S.A.), B.B.A. (General Management, Ramkhamhaeng University, Thailand), B.Eng. (Electrical Engineering, Chulalongkorn University, Thailand)

Asst. Prof. Toryos Pandejpong, Ph.D. (System Science, Engineering and Technology Management, Portland State University, U.S.A.), M.B.A. (University of Portland, U.S.A.), M.Sc. (Engineering Management, Portland State University, U.S.A.), B.Eng. (Chemical Engineering, Chulalongkorn University, Thailand)

Asst. Prof. Vassana Maprasert, D.B.A. (Marketing, Thammasat University, Thailand), M.B.A. (Marketing, Chulalongkorn University, Thailand), B.B.A. (Accounting, Assumption University, Thailand)

Dr. Anupong Avirutha, D.B.A. (Organizational Development, Argosy University, California, U.S.A.), M.B.A. (Marketing, Meinders School of Business, Oklahoma City University, U.S.A.), M.B.A. (Information Technology, Meinders School of Business, Oklahoma City University, U.S.A.), B.B.A. (Management, University of the Thai Chamber of Commerce, Bangkok, Thailand).

Dr. Arthit Sathavorasit, Ph.D. (Law, Cardiff University, U.K.), M.Sc. (Fiscal Studies, University of Bath, U.K.), LL.M. (Tax, UCL, United Kingdom), LL.B. (Thammasat University, Thailand)

Dr. Charnporn Holomyong, Ph.D. (Economics, University of Utah, U.S.A.), M.A. (Economics, Chulalongkorn University, Thailand), B.A. (Economics, Thammasat University, Thailand)

Dr. Jade Donovanik, Post Doctoral Research (MaxPlanck Institute, Munich, Germany), J.S.D. (Law, Stanford University, U.S.A.), J.S.M. (Law, Stanford University, U.S.A.), LL.B. (Law, Thammasat University, Thailand)

Dr. Manop Udomkermongkol, Ph.D. (Economics, University of Nottingham, U.K.), M.Sc. (Economics and Econometrics, University of Nottingham, U.K.), B.A. (Economics, Thammasat University, Thailand)

Dr. Nopporn Ruangwanit, Ph.D. (Marketing, Thammasat University, Thailand), M.Sc. (Marketing Communication, Illinois Institute of Technology, U.S.A.), B.B.A. (General Management, Assumption University, Thailand)

Dr. Sirikamon Udopol, Ph.D. (Economics, University of Exeter, U.K.), M.Sc. (International Business and Finance, University of Reading, U.K.), B.A. (Economics, Thammasat University, Thailand)

Dr. Thadthong Bhrammanee, D.Tech.Sc. (Information Management, Asian Institute of Technology, Thailand), M.B.A. (Information Systems, The University of Toledo, Ohio, U.S.A.), B.A. (Business Administration, Mahidol University, International Student Degree Program, Thailand)

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Dr. Worapong Janyangyuen, D.B.A. (Finance, Chulalongkorn University, Thailand), M.S. (Financial Investment, University of Denver, U.S.A.), M.B.A. (Finance, University of Denver, U.S.A.), B.B.A. (Finance, Assumption University, Thailand), Chartered Financial Analyst (C.F.A.) Program Level III

Mrs. Sugunya Ngao-suratchanee, Ph.D. Candidate (Finance, National Institution of Development Administration, Thailand), M.B.A. (Accounting and Finance, Northrop University, U.S.A.), M.S. (Accounting, Chulalongkorn University, Thailand), B.A. (Accounting), Chulalongkorn University, Thailand)

Mr. Arm Sivadith, M.B.A. (C.T. Bauer College of Business, University of Houston, U.S.A.), B. Eng (Computer Engineering) King's Mongkut Institute of Technology at Ladkrabang, Thailand

Mr. Chaivatna Sumetphong, M.Sc (Computer Science, Asian Institute of Technology), B.Sc (Computer Science, ISDP, Mahidol University)

Mr. Chaiyong Ngampravatdee, Cert., Advanced Taxation (Chulalongkorn University, Thailand), M.C.L. (Indiana University, U.S.A.), Barrister at Laws, LL.B. (Honors) (Thammasat University, Thailand)

Mr. Kelley Ritchey, Ph.D. Candidate (College of Management, Mahidol University, Thailand), M.A. (International Economics and Finance, Chulalongkorn University, Thailand), M.B.A., (Finance, University of California, U.S.A.), B.A. (Politics, Whitman College, U.S.A.)

Mr. Kulchai Chungasathaporn, LL.C.M. (Comparative Laws, University of Pennsylvania, Philadelphia, U.S.A.), LL.M. (University of Pennsylvania, Philadelphia, U.S.A.), LL.B. (Thammasat University, Thailand)

Mr. Michael Naglis, M.B.A. (Assumption University, Thailand), B.A. (International Student Degree Program, Mahidol University, Thailand)

Mr. Narudh Areesorn, M.Sc. (Management, London School of Economics and Political Science, U.K.), B.Sc. (Philosophy and Economics, London School of Economics and Political Science, U.K.)

Mr. Pasun Wattanachai, MSEE (Electrical Engineering, University of Southern California, USA), MSc (Computer Science, Depaul University), B.Eng. (Electrical Engineering, Chulalongkorn University, Thailand)

Mr. Pasit Boonyakiat, M.Sc. (Computer Science, Chulalongkorn University, Thailand), B.Eng. (Computer Engineering, Chulalongkorn University, Thailand)

Ms. Patra Shovityakool, M.S. (Engineering Management, University of Southern California, U.S.A.), B.S. (Industrial Engineering, University of Southern California, U.S.A.)

Mr. Phillip Stiens, M.Sc. (Sports Management, American Public University, West Virginia, U.S.A.), Post Graduate Certificate (Education, Exeter University, U.K.), B.A. (Humanities, University of Wales, Swansea, U.K.)

Mr. Sattar Puangpathanachai, M.B.A. (Business Administration, Thammasat University, Thailand), BS-BA (Accounting, Sukhotahi Thammathirat, Thailand), BS-BA (Management Information System, Boston University, U.S.A)

Mr. Subin Liengpunsakul, M.Phil. (Finance, University of Cambridge, U.K.), M.Sc. (Operations Research, Stanford University, U.S.A.), B.Eng. (Honors) (Electrical Engineering, King Mongkut Institute of Technology, Ladkrabang, Thailand)

Mr. William Burke, M.Acct. (Accounting Information Systems, Arizona State University, U.S.A.), B.Sc. (Transportation and Public Utilities Management, Indiana University, Bloomington, U.S.A.)

Ms. Suwalya Khemvaraporn, B.B.A. (Human Resource Management, Bernard Baruch College, U.S.A.), A.A.S. (Travel and Tourism Management, Borough of Manhattan U.S.A.)

Mr. Kris Nawani, B.A. and B.Sc. (Political Science, Boston University, U.S.A.)

Mr. Ron Dale, B.A. (English, Illinois Wesleyan University, U.S.A.)

| RESEARCH INTERESTS |

Assistant Professor Yingyot Chiaravutthi

Bhatiasevi, V., Chiaravutthi, Y., "The Battle for World Wide Web Dominance: In Search of Network Externalities," Medwell Journals, International Business Management, 5(2), 2011: 66-75.

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- Chiaravutthi, Y.**, "Consumer Willingness to Pay for Different Blends of Genetically Modified Food," funded by Thailand Research Fund, working paper.
- Chiaravutthi, Y.** and Udomroekchai, W., "Thai Consumer Willingness to Pay for Genetically Modified Rice," working paper.

Dr. Atthapong Sakunsriprasert

- Chaimahawong, V., and **Sakunsriprasert, A.**, "An Integrative Review of Key Determinants Affecting Family Business Succession," *วารสารมนุษยศาสตร์และสังคมศาสตร์ มหาวิทยาลัยอุบลราชธานี*, 1(1), July-December 2010.
- Sakunsriprasert, A.**, "Creating Innovation through a Business Model Framework and its Implications for the Siam Cement Group," *Suthiparithat Journal*, Jan-Apr 2010.
- Sakunsriprasert, A.**, "Blueprint for Small Size Company," Book Publication, October 2009.
- Sakunsriprasert, A.** and Chiaravutthi, Y., "Network Externalities and Valuation of Motorcycle Brands," *Chulalongkorn Review* 21(81), October-December 2008: 74-89.

Dr. Chairawee Anamthawat-Kierig

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- Anamthawat-Kierig, C.**, "Why do Retail Clusters Expand Remarkably in Bangkok?," *the International Journal of Population and Social Studies*, forthcoming, July 2009.

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Anamthawat-Kierig, C., and Sawasdironabhakdi, P., "A Study of Consumer Choice in Clustered Grocery Stores in an Emerging Market," working paper.

Dr. Jun Jiang

Jiang, J., "A Theory of Banking Regulation," *European Journal of Economics, Finance and Administrative Sciences*, (27) 2010: 18-28.

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BUSINESS ADMINISTRATION PROGRAMS

| DEGREES OFFERED |

- Bachelor of Business Administration (Business Economics)
- BBA (Business Economics)
- Bachelor of Business Administration (Finance)
- BBA (Finance)
- Bachelor of Business Administration (Information Systems)
- BBA (Information Systems)
- Bachelor of Business Administration (International Business)
- BBA (International Business)
- Bachelor of Business Administration (Marketing)
- BBA (Marketing)

| BUSINESS ADMINISTRATION PROGRAM |

The Business Administration Program is an innovative program that covers a wide range of theories and practices. The program offers a global edge on the international market and prepares students for employment opportunities in any hemisphere. The program will equip students with in-depth useable technical know-how, communication skills, and practical business knowledge embracing significant aspects of the international and domestic environment. They will be thoroughly prepared to enter the dynamic and ever changing business world.

| CAREER OPPORTUNITIES AND POST GRADUATE STUDY |

Many Business Administration graduates go directly into national and multinational companies and are well qualified to adapt to the reality of business. More than 50% of our graduates also go on to post-graduate studies in Australia, the USA, the UK, Canada or Thailand.

| CURRICULUM STRUCTURE |

| Business Administration Program |

Courses	Credits
General Education Courses	59
Core Business Courses	56
Required Major Courses	44
Elective Major Courses	20
Free Elective Courses	8
<i>Total</i>	<i>187</i>

| COURSE LIST |

General Education Courses

English Communication

16 credits

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)
ICCM 111	Advanced English Communication I	4 (4-0-8)
ICCM 112	Advanced English Communication II	4 (4-0-8)
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 461	Topics in Comparative Literature A: Poetry	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.

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

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English courses.

Humanities			12 credits
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 106	Moral and Ethical Studies		4 (4-0-8)
ICHM 107	Introduction to Asian Philosophy		4 (4-0-8)
ICHM 140	Elements of Art Theory		4 (4-0-8)
ICHM 141	Art Appreciation (Ancient Art - Renaissance & Baroque)		4 (4-0-8)
ICHM 142	Art Appreciation II (18 th century - Present)		4 (4-0-8)
ICHM 143	Introduction to Photography		4 (3-2-7)
ICHM 144	Intermediate Photography		4 (3-2-7)
ICHM 203	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	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	Western Classical Ideal		4 (4-0-8)
ICHM 241	Introduction to Drawing		2 (1-2-3)
ICHM 242	Intermediate Drawing		2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses (in black above): ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: TIM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

Health Science and Physical Education			3 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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)
ICPE	122	Selected Topics in Sports	1 (0-3-1)
ICPE	123	Cycling	1 (0-3-1)

Natural Sciences			16 credits
ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	103	Fundamental Mathematics	4 (4-0-8)
ICNS	104	Fundamental Statistics	4 (4-0-8)
ICNS	111	Fundamental Biology	4 (4-0-8)
ICNS	122	Fundamental Chemistry	4 (4-0-8)
ICNS	131	Fundamental Physics	4 (4-0-8)

ICNS	141	Computer Essentials	4 (3-2-7)
ICNS	142	Introduction to Internet Technology	4 (3-2-7)
ICNS	151	General Ecology	4 (4-0-8)
ICNS	152	Southeast Asian Ecology	4 (4-0-8)
ICNS	153	Ecosystems and Natural Resources	4 (4-0-8)
ICNS	154	Science, Technology and Environment	4 (4-0-8)
ICNS	161	General Geology	4 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
ICNS	252	Marine Biology	4 (3-2-7)
ICNS	253	Environmental Science	4 (4-0-8)
ICNS	254	Pollution Biology	4 (3-2-7)
ICNS	256	Sustainable Development	4 (4-0-8)
ICNS	257	Environmental Issues: Past, Present and Future	4 (4-0-8)

Social Sciences
12 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	121	Southeast Asian Studies	4 (4-0-8)
ICSS	131	World History I	4 (4-0-8)
ICSS	132	World History II	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	138	Developmental Psychology	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	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	Introduction to World History D (1945-c.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	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	241	Latin America Since 1800	4 (4-0-8)
ICSS	243	North America c. 1763 — 1900	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	271	An Introduction to International Relations	4 (4-0-8)
ICSS	272	An Introduction to Comparative Political Systems	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	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	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 & Theater	4 (4-0-8)
ICSS	343	Introduction to North America History c. 1763-1900	4 (4-0-8)
ICSS	344	Introduction to North America History since 1900	4 (4-0-8)
ICSS	346	Introduction to Europe History since 1945	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 in the Modern World	4 (4-0-8)
ICSS	374	Introduction to International Organizations	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)

Note: All BBA students are not allowed to take ICSS 114 Introduction to Economics as a social science course or as a free elective course.

Requirements to start taking BBA courses:

BBA students may commence taking BBA courses only if they have met the following requirements (there is no exception):

1. Passed ICCM 105 Intermediate English Communication II with a minimum C grade
2. Attained a minimum of 40 credits of General Education Courses
3. Passed ICNS 104 Fundamental Statistics with a minimum D grade

Business Administration Courses

Core Business Courses			56 credits
ICMB	201	Macroeconomics	4 (4-0-8)
ICMB	202	Microeconomics	4 (4-0-8)
ICMB	211	Fundamental Financial Accounting	4 (4-0-8)
ICMB	212	Managerial Accounting	4 (4-0-8)
ICMB	221	Principles of Marketing	4 (4-0-8)
ICMB	232	Essentials of Management	4 (4-0-8)
ICMB	233	Human Resource Management	4 (4-0-8)
ICMB	281	Computers in Management	4 (4-0-8)
ICMB	341	Business Law	4 (4-0-8)
ICMB	351	International Business Management	4 (4-0-8)
ICMB	363	Management Science	4 (4-0-8)
ICMB	371	Business Finance	4 (4-0-8)
ICMB	372	Financial Management	4 (4-0-8)
ICMB	431	Strategic Management	4 (4-0-8)

Note: All BBA students are required to earn at least a C grade in each of the Core Business Courses.

1. Business Economics Major
Required Business Economics Major Courses 44 credits

ICBE	341	Mathematics for Business and Economics	4 (4-0-8)
ICBE	342	Intermediate Microeconomics	4 (4-0-8)
ICBE	343	Intermediate Macroeconomics	4 (4-0-8)
ICBE	344	Econometrics I	4 (4-0-8)
ICBE	345	Monetary Policy	4 (4-0-8)
ICBE	346	Public Economics	4 (4-0-8)
ICBE	441	Econometrics II	4 (4-0-8)
ICBE	442	International Finance	4 (4-0-8)
ICBE	443	International Trade	4 (4-0-8)
ICBE	444	Industrial Organization	4 (4-0-8)
ICBE	446	Cost-Benefit Analysis	4 (4-0-8)

Elective Business Economics Major Courses			20 credits
ICMB	491	Practical Business Training - On Campus*	8 (0-24-8)
ICMB	492	Practical Business Training - Off Campus*	12 (0-36-12)
ICMB	493	Directed Research*	8 (8-0-16)
ICBE	347	Development Economics	4 (4-0-8)
ICBE	348	Economics of Human Resources	4 (4-0-8)
ICBE	445	Economics of Strategy	4 (4-0-8)
ICBE	447	Corporate Governance and Business Ethics	4 (4-0-8)
ICIS	385	Information Technology Economics	4 (4-0-8)
ICMF	375	Multinational Corporate Finance	4 (4-0-8)
ICMI	454	International Logistic Management	4 (4-0-8)

Note: All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 493

Free Elective Courses **8 credits**

Students can take any courses (except for ICSS 114 Introduction to Economics) offered by MUIC as a free elective course with approval from the advisor.

2. Finance Major

Required Finance Major Courses			44 credits
ICBE	341	Mathematics for Business and Economics	4 (4-0-8)
ICBE	344	Econometrics I	4 (4-0-8)
ICBE	441	Econometrics II	4 (4-0-8)
ICMF	311	Intermediate Accounting I	4 (4-0-8)
ICMF	312	Intermediate Accounting II	4 (4-0-8)
ICMF	375	Multinational Corporate Finance	4 (4-0-8)
ICMF	376	Financial Modeling	4 (4-0-8)
ICMF	471	Financial Investment	4 (4-0-8)
ICMF	473	Financial Theory	4 (4-0-8)
ICMF	478	Risk Management	4 (4-0-8)
ICMF	479	Seminar in Finance	4 (4-0-8)

Elective Finance Major Courses **20 credits**

ICMB	491	Practical Business Training - On Campus	8 (0-24-8)
ICMB	492	Practical Business Training - Off Campus*	12 (0-36-12)
ICMB	493	Directed Research*	8 (8-0-16)
ICBE	342	Intermediate Microeconomics	4 (4-0-8)
ICBE	343	Intermediate Macroeconomics	4 (4-0-8)
ICBE	442	International Finance	4 (4-0-8)
ICBE	447	Corporate Governance and Business Ethics	4 (4-0-8)
ICMF	374	Money, Banking and Financial Markets	4 (4-0-8)

ICMF	475	Case Studies in Finance	4 (4-0-8)
ICMK	424	Global Marketing Strategy	4 (4-0-8)

Note: All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 493

Free Elective Courses **8 credits**

Students can take any courses (except for ICSS 114 Introduction to Economics) offered by MUIC as a free elective course with approval from the advisor.

3. Information Systems Major

Required Information Systems Major Courses **44 credits**

ICIS	210	Introduction to Programming	4 (3-2-7)
ICIS	381	Fundamentals of Computer Systems	4 (4-0-8)
ICIS	382	Object-Oriented Programming	4 (3-2-7)
ICIS	383	Database Management System	4 (3-2-7)
ICIS	384	Introduction to Computer Networks	4 (4-0-8)
ICIS	386	Electronic Commerce	4 (4-0-8)
ICIS	388	Network Programming	4 (3-2-7)
ICIS	389	Information Systems in Management	4 (4-0-8)
ICIS	482	Systems Analysis & Design	4 (4-0-8)
ICIS	483	Software Engineering	4 (4-0-8)
ICMI	454	International Logistic Management	4 (4-0-8)

Elective Information Systems Major Courses **20 credits**

ICMB	491	Practical Business Training - On Campus*	8 (0-24-8)
ICMB	492	Practical Business Training - Off Campus*	12 (0-36-12)
ICMB	493	Directed Research*	8 (8-0-16)
ICIS	385	Information Technology Economics	4 (4-0-8)
ICIS	387	Information Systems Security	4 (4-0-8)
ICIS	481	Internet Design and Development	4 (4-0-8)
ICIS	488	IT Based Knowledge Management	4 (4-0-8)
ICBE	344	Econometrics I	4 (4-0-8)
ICBE	447	Corporate Governance and Business Ethics	4 (4-0-8)
ICMK	329	Advertising and Graphic Design	4 (4-0-8)

Note: All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 493

Free Elective Courses **8 credits**

Information Systems students can take any courses (except for ICSS 114 Introduction to Economics, ICNS 141 Computer Essentials and ICNS 142 Introduction to Internet Technology) offered by MUIC as a free elective course with approval from the advisor.

4. International Business Major

Required International Business Major Courses		44 credits
ICMI	352 Legal Issues in International Business	4 (4-0-8)
ICMI	354 Cross-cultural Management	4 (4-0-8)
ICMI	357 Business Communication	4 (4-0-8)
ICMI	358 People and Organization in International Business	4 (4-0-8)
ICMF	375 Multinational Corporate Finance	4 (4-0-8)
ICMK	424 Global Marketing Strategy	4 (4-0-8)
ICBE	442 International Finance	4 (4-0-8)
ICBE	443 International Trade	4 (4-0-8)
ICMI	454 International Logistic Management	4 (4-0-8)
ICMI	456 Export-Import Management	4 (4-0-8)
ICIS	484 Management Information System	4 (4-0-8)

Elective International Business Major Courses		20 credits
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ICMB	491 Practical Business Training - On Campus*	8 (0-24-8)
ICMB	492 Practical Business Training - Off Campus*	12 (0-36-12)
ICMB	493 Directed Research*	8 (8-0-16)
ICMI	355 Business Alliance	4 (4-0-8)
ICMI	360 Leadership Development	4 (4-0-8)
ICBE	343 Intermediate Macroeconomics	4 (4-0-8)
ICBE	344 Econometrics I	4 (4-0-8)
ICBE	447 Corporate Governance and Business Ethics	4 (4-0-8)
ICMF	311 Intermediate Accounting I	4 (4-0-8)
ICMK	316 Consumer Behavior	4 (4-0-8)

Note: All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 493

Free Elective Courses	8 credits
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Students can take any courses (except for ICSS 114 Introduction to Economics) offered by MUIC as a free elective course with approval from the advisor.

5. Marketing Major

Required Marketing Major Courses		44 credits
ICMK	316 Consumer Behavior	4 (4-0-8)
ICMK	317 Marketing Research I	4 (4-0-8)
ICMK	318 Marketing Research II	4 (4-0-8)
ICMK	319 New Product Management	4 (4-0-8)
ICMK	323 Integrated Marketing Communication	4 (4-0-8)
ICMK	325 Business Marketing	4 (4-0-8)
ICMK	328 Marketing Channel Management	4 (4-0-8)

ICBE	444	Industrial Organization	4 (4-0-8)
ICBE	445	Economics of Strategy	4 (4-0-8)
ICMI	454	International Logistics Management	4 (4-0-8)
ICMK	428	Marketing Strategy	4 (4-0-8)

Elective Marketing Major Courses **20 credits**

ICMB	491	Practical Business Training - On Campus*	8 (0-24-8)
ICMB	492	Practical Business Training - Off Campus*	12 (0-36-12)
ICMB	493	Directed Research*	8 (8-0-16)
ICMK	329	Advertising and Graphic Design	4 (4-0-8)
ICMK	330	Strategic Brand Management	4 (4-0-8)
ICMK	424	Global Marketing Strategy	4 (4-0-8)
ICMK	425	Retail Management	4 (4-0-8)
ICBE	344	Econometrics I	4 (4-0-8)
ICBE	447	Corporate Governance and Business Ethics	4 (4-0-8)
ICIS	389	Management Information System	4 (4-0-8)

Note: All BBA students are required to take either ICMB 491 or ICMB 492 or ICMB 493

Free Elective Courses **8 credits**

Students can take any courses (except for ICSS 114 Introduction to Economics) offered by MUIC as a free elective course with approval from the advisor.



**MAHIDOL
UNIVERSITY**
Wisdom of the Land

International College



HUMANITIES AND LANGUAGE

DIVISION

The Humanities and Language Division offers General Education courses in four programs: English Studies, Foreign Languages, Humanities, and Health Science and Physical Education. In addition, the Division offers minors and certificates in English Studies, Chinese, French, Spanish, German, Japanese, and Spanish. (For more information about these programs, please see the Minors section.)

| DIVISION CHAIRMAN |

Mr. John McNulty, B.Sc. (Marketing; University of Oregon, USA), M.B.A. (Heriot-Watt University, UK)

| DIVISION VICE CHAIRMAN |

Dr. Gerald Moshammer, M.A. (Instrumental Pedagogy/Piano; University of Music and Performing Arts Vienna, Austria), M.Phil. (Philosophy; University of Vienna, Austria), Ph.D. (Philosophy; University of Vienna, Austria)

| PROGRAM DIRECTORS |

| English Studies Program |

Mr. Jonathan Green, B.A. (English Literature in Law; University of the Witwatersrand, S.Africa), M.Ed. (Education Management and TESL, University of Southern Queensland, Australia)

| Foreign Languages Program |

Mr. Bruno Mahon, B.A. (Teaching French as a Foreign Language; Stendhal University, France), M.A. (Business Administration; Ecole Supérieure de Commerce d'Administration des Entreprises de Bordeaux, France)

| PROGRAM COORDINATORS |

| Foreign Languages Program |

Mr. Thomas Krey, M.A. (German Language & Literature and Educational Science; Universität zu Köln, Germany)

| Humanities Program |

Dr. Gerald Moshammer, M.A. (Instrumental Pedagogy/Piano; University of Music and Performing Arts Vienna, Austria), M.Phil. (Philosophy; University of Vienna, Austria), Ph.D. (Philosophy; University of Vienna, Austria)

| Physical and Health Education Program |

Mr. Michael Naglis, B.A. (Business Administration; Mahidol University International College, Thailand), M.B.A. (Marketing; Assumption University, Thailand)

| FACULTY MEMBERS |**| Full-Time |**

Ms. Agnieszka Atthasit, B.A. (Teaching French as a Foreign Language; University of Toulouse-le Mirail, France), M.A. (Teaching French as a Foreign Language; University of Toulouse-le Mirail, France)

Ms. Analiza Amurao, AB-BSE (English Language Teaching; Philippine Normal University, Philippines), M.A. (English Language and Literature; Ateneo De Manila University, Philippines), GDip (TESOL; SEAMO Regional Language Center, Singapore).

Assistant Professor Anchalee Pongpun, B.A. (Linguistics; Thammasat University, Thailand), M.A. (Applied Linguistics-English for Science and Technology; Mahidol University, Thailand), Diploma in TESL (Victoria University of Wellington, New Zealand.)

Ms. Arpaporn Iemubol, B.A. (English; Thammasat University, Thailand), M.A. (English Language Studies and Methods; University of Warwick, UK)

Ms. Barbara Ekamp, M.A. (Philosophy, German Language and Literature; Universität zu Köln, Germany), M.A. (Sinology; Freie Universität Berlin, Germany)

Mr. Bruno Mahon, B.A. (Teaching French as a Foreign Language; Stendhal University, France), M.A. (Business Administration; Ecole Supérieure de Commerce d'Administration des Entreprises de Bordeaux, France)

Dr. Charles Windish, B.A. (French and History; Florida State University, USA), M.A. (French; Florida State University, USA), Ph.D. (Adult Education Program Management; Georgia State University, USA)

Ms. Cristina Schoonmaker, B.A. (English/French; The American College in Paris, France), M.A. (Applied Linguistics/ TESL: University of California, USA)

Dr. Gerald Moshammer, M.A. (Instrumental Pedagogy/Piano; University of Music and Performing Arts Vienna, Austria), M.Phil. (Philosophy; University of Vienna, Austria), Ph.D. (Philosophy; University of Vienna, Austria)

Mr. Ian Andres, B.A. (Marketing; University of Greenwich, UK), M.A. (TESOL; California State University Sacramento, USA)

Mr. Ian McDonald, B.Sc. (Psychology; Eastern Michigan University, USA), M.A. (Psychology; Stephen Austin State University, USA)

Mr. James Whitlam, B.Sc. (Geography; University of Pittsburgh, USA), M.Sc. (Geography; University of Alabama, USA), M.A. (TESOL; University of Alabama, USA)

Mr. John McNulty, B.Sc. (Marketing; University of Oregon, USA), M.B.A. (Heriot-Watt University, UK)

Mr. John Power, DELTA (English Language Teaching to Adults; Cambridge, UK), M.A. (TESOL; Sheffield Hallam University, UK)

Mr. Jonathan Green, B.A. (English Literature in Law; University of the Witwatersrand, S.Africa), M.Ed. (Education Management and TESL, University of Southern Queensland, Australia)

Ms. Mariejoy Buenaventura, B.A. (European Languages; University of the Philippines, Magna Cum Laude), M.A. (Liberal Studies; Dartmouth College, USA)

Mr. Mark Rodell, B.A. (English-Creative Writing, San Francisco State University, USA), M.A. (English-Creative Writing, Syracuse University, USA)

Mr. Nicholas Ferriman, B.A. (Physical Education and Sports Science; Loughborough University of Technology, UK), M.A. (TESOL; Sheffield Hallam University, UK)

Ms. Nita Porncharoenroj, B.B.A. (General Management; Assumption University, Thailand), M.B.A. (Finance and Investment; Stuttgart Institute of Management and Technology, Germany)

Ms. Ori Green, B.A. (English; Kanda University of International Studies, Japan), GDTL (Graduate Diploma in Learning and Teaching; University of Southern Queensland, Australia)

Mr. Phillip Stiens, B.A. (Humanities; University College of Swansea, Wales, UK), PG. Cert. (Education; Exeter, UK), M.A. (Sports Management; American Public University-West Virginia, USA)

Mr. Prateep Wongverayuth, B.A. (Political Science; Chulalongkorn University, Thailand), M.A. (Politics, Chulalongkorn University, Thailand)

Mr. Russell Pattinson, B.A. (Hons) (Documentary Communication; University of Humberside, UK)

Mr. Takayoshi Fujiwara, B.A. (Linguistics; University of Tsukuba, Japan), B.A. (Mass Communication; University of Tsukuba, Japan), M.A. (Social Psychology; Hitotsubashi University, Japan)

Mr. Thomas Krey, M.A. (German Language & Literature and Educational Science; Universität zu Köln, Germany)

Dr. Walter Persaud, B.A. (History; York University, Canada), M.A. (Political Science; York University, Canada), M.A. (Education; New Hampshire College, USA), GDip. (Latin American and Caribbean Studies; York University, Canada), PhD. (Social and Political Thought; York University, Canada)

Dr. William Bloch, B.A. (Biological Science; University of Pennsylvania, USA), D.M.D. (Dental Medicine; University of Pennsylvania, USA)

Mr. Zhang Bo, B.A. (Japanese, Haidian Day University, China)

Ms. Zhang Qiujuan, B.A. (English-Chinese; Beijing Language and Culture University, China), M.A. (Modern and Contemporary Chinese Literature from Huachiew University, China and Huachiew Chalermprakiet University, Thailand)

| **Part-Time** |

Dr. Alexander Wynne, B.A. (Hons)(Theology and Religious Studies; Bristol University, UK), M.A. (Classical Indian Religion; Oxford University, UK), Ph.D. (Oriental Studies; Oxford University, UK)

Mr. Adichai Nirattisayangkool, B.Eng. (Civil Engineering), Cert. of Class Teaching Professional

Ms. Ampha Sugunno, M.A. (Sports Management; Mahidol University, Thailand)

Mr. Aniruth Nimiwattana, Associate Degree (Electronics and Computer Systems; Swinburne University, Australia)

Mr. Cheksant Gangakate, B.F.A. (University of Nebraska at Kearney, USA)

Mr. Jason Woerner, B.A. (Linguistics; University of Washington, USA), B.F.A. (Photography; University of Washington, USA)

Dr. Julian Hardy, B.A. (English Language, Literature and Civilization; University of Metz, France), M.A. (English Language, Literature and Civilization; University of Metz, France), Ph.D. (ABD) (History and Civilization; University of Paris 8, France)

Mr. Kasem Piyasongsut, B.A. (Physical Education; Srinakarinwirote University, Thailand) M.A. (Sports Management; Mahidol University, Thailand)

Mr. Kittipong Thongpae, B.A.

Mr. Mark Manning, B.A. (English; Florida State University, USA)

Ms. Narisa Dumrongvaree, B.A. (German, Chulalongkorn University, Thailand), M.A. (German Studies / Culture and Communication, Technische Universitaet Dresden, Germany)

Mr. Phadung Intalang, B.A. (Law; Ramkhamhaeng University, Thailand)

Mr. Samuel Allen, B.A. (Urban Studies; Sheffield Hallam University, UK)

Mr. Somnuek Traisutti, B.A. (Law; Ramkhamhaeng University, Thailand)

Ms. Sumon Panleartkitsakul, B.A. (Political Science)

Mr. Vijit Kruasophon, M.A. (English)

Mr. Vorodom Viravong, B.Sc.N. (Science Nursing; McMaster University, Canada), Associate Degree (Psychology; McMaster University, Canada), M.MA. (Entrepreneurial Management; College of Management Mahidol University, Thailand)

| RESEARCH INTERESTS |

Research interests among faculty in the Division include, but are not limited to...

Foreign and second language acquisition: effectiveness of current language-teaching methodologies; learning and teaching styles; cultural, ethical, psychological and biological aspects of foreign and second language acquisition.

Cross-cultural studies: cultural factors in discourse analysis; cultural influence on use and perception of non-verbal cues during public speaking; globalization and its effect on language; Knowledge transfer between Europe and China in the Age of Enlightenment; Cultural restraints with regard to teaching World Literature in higher education with a focus on Thailand;

Studies in the Humanities: structural reduction of ontological heterogeneity in Philosophy and Knowledge Representation; insufficiencies of classical Logic in the analysis of relevant reasoning; categorization as a didactical instrument in guided ethical reasoning; isomorphic visualization of musical expression in terms of weight and movement

Technology in education: research and development of multimedia CD-ROMs and e-learning sites (e.g. on-line, interactive foreign language courses or teaching aids, and/or a CD-Rom on the Arts of Thailand).

Academic evaluation: comparative studies of popular English language proficiency tests: TOEFL, IELTS, TOEIC; effect of teacher comments on student motivation.

Academic Integrity: motivating factors for student cheating and plagiarism; proactive policies for educators and administrators with regards to decreasing academic dishonesty; ethics and research; ethics and technology.

Teaching methodology: application of the findings of such research to the development/improvement of the English and Foreign Languages curricula, teaching approaches, classroom techniques and teaching materials; semiotic reconstruction of aesthetic experience and interpretation; scope and limits of Nelson Goodman's analytic symbol theory as a teaching tool.

| COURSE LIST |

English Studies			16 credits
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)
ICCM	111	Advanced English Communication I	4 (4-0-8)
ICCM	112	Advanced English Communication II	4 (4-0-8)
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	461	Topics in Comparative Literature A: Poetry	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 course 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 required to successfully complete ICCM100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English courses.

Humanities			12 credits
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	106	Moral and Ethical Studies	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy	4 (4-0-8)
ICHM	140	Elements of Art Theory	4 (4-0-8)
ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Intermediate Photography	4 (3-2-7)
ICHM	203	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	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	Western Classical Ideal	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses (in black above): ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

Health Science and Physical Education			3 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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)
ICPE	122	Selected Topics in Sports	1 (0-3-1)
ICPE	123	Cycling	1 (0-3-1)



FINE *AND*
APPLIED ARTS
DIVISION

The Fine and Applied Arts Division offers three major programs in Entertainment Media Production (Television Production, Film Production, and Animation Production), and one major program in Communication Design.

| DIVISION CHAIRMAN |

Assistant Professor Surapong Lertsithichai, B. Arch (Gold Medal First Class Honor), (Architecture: Chulalongkorn University), Master of Architecture (Architecture: Yale School of Architecture), Master in Design Studies (Design Studies: Harvard Design School), Ph.D., Doctor in Design (Design: Harvard Design School)

| PROGRAM DIRECTORS |

| Communication Design Program |

Mr. Dale Konstanz, B.A. (Studio Art / Art History: Ripon College) M.F.A. (Painting: Savannah College of Art and Design)

| PROGRAM ADVISOR |

| Entertainment Media Production Program |

Prof. Charles Harpole, B.A. (English and Philosophy: University of Kentucky), M.A. (English and Philosophy: University of Kentucky), M.A. (Cinema: New York University), Ph.D. (Cinema: New York University)

| FACULTY MEMBERS |

| Full-Time |

Mr. Aaron Schmidt, B.A. (Visual Communication Arts: Assumption University)

Mr. Bryan Ott, B.A. (Japanese Studies: University of California, USA) M.A. (Television, Film and New Media: San Diego State University)

Ms. Carol Siatras, B.A. (Hons), (Visual Arts: Brown University, USA), M.F.A. (Sculpture: University of Wisconsin, USA)

Ms. Dynaya Bhutipunthu, B.F.A (2nd class honor), (Communication Design: Chulalongkorn University), M.F.A. (Communication Design: Iowa State University of Science and Technology)

Assoc. Prof. Lonzia Berry, B.A. (Biology & Music Composition: Brown University), M.A. (Theatre, Speech & Dance: Brown University, USA), M.F.A. (Stage Directing: Yale University)

Ms. Millicent Young, B.A. (Hons) (Creative Arts HND, (Combined Studies): Manchester Metropolitan University), M.A. (Sequential Art: Brighton University)

Dr. Jintanant Chaya Subhamitr, Ph.D. B.A. (KU), M.A. (U. of Leicester) Ph.D. (Silpakorn University)

Assist. Prof. Paul Cornelius, B.A. (Austin University), M.A. and Ph.D. (University of Texas), B.A. (History, English & Political Science: Stephen F. Austin State University, Ph.D. (Humanities: University of Texas at Dallas)

| **Part-Time** |

Mr. Dorn Ratanathatsanee, B.A. (Drama/Film: Alaska Methodist University)

Mr. Baptiste Mauerhan, B.A. (Mathematics and Socials Sciences: University of Science of Luminy, France)

Mr. Nontawat Eua-Phaiboonwattana, B.A. (International Business Management: University of Thai Chamber of Commerce), M.F.A. (Computer Arts: The Academy of Art College, San Francisco, USA)

Ms. Tinagorn Cooper, B.A. (Fine Art: The Slade School of Fine Art, London)

Mr. David Smith, B.A. (Visual Arts: University of New South Wales, Australia)

Mr. Prawit Taeng-Aksorn, B.A. (Communication Arts: Chulalongkorn University)

Mr. Al Caudullo, B.A. (Electronic Engineering: California State Polytechnic University, USA)

Mr. Brian Curtin, M.A. (Studio art: University of Ulster at Belfast, Ireland), Ph.D. (Studio art + visual cultural studies: University of Bristol, UK)

Mr. Kittichon Kulratchol, Certificate Hollywood Academy of Make-Up Advance Prosthetics, Diploma, Cinema Hollywood Academy of Make-Up

Mr. Sugimasa Yamashita, B.A. (Motion Picture & Television: Academy of Art University, San Francisco), B.A. (Interior Design: Tokyo Zokei University)

Mr. Les Nordhauser, B.A. (English Psychology: State University of New York), M.A. (English Education: State University of New York), Training Congress (Drama: American Conservatory Theatre), Occupational Certificate (Commercial Still Photography: Santa Monica College), Occupational Certificate (Film and Television: Los Angeles City College)

Mr. Manop Sujaritpinij, B.A. (Advertising and Marketing: Webster University), M.A. (Communication Management: Webster University)

Mr. Tuang Dheandhanoo, B.A. (Architecture: Chulalongkorn University), M.F.A. (Computer Art: School of Visual Arts, USA)

Mr. Sujin Wattanawongchai, B.A. (Art Education: Chulalongkorn University), M.F.A. (Fine Art: Fort Hays State University, USA)

Mr. Cheksant Gangakate, B.F.A. (Fine Art/ Painting: University of Nebraska at Kearney), M.F.A. (Communication Design: King Mongkutt University of Technology)

Ms. Jeaw Nyee Tan, B.A. (Theater Design and Fine Arts: Indiana University), M.F.A. (Theater Design: California Institute of the Arts, USA)

Mr. Saksiri Chantarangri, B.A. (Visual Communication: Srinakharinrajavidyalaya University), M.A. (Film & Television Production: New York Institute of Technology, USA)

Mr. Krit Jintanaponpan, B.A. (Landscape Architecture: Chulalongkorn University)

Dr. Palphol Rodloytuk, B.A. (Technical Communication: Eastern Washington University, USA), M.A. (Mass Communication: California State University, Fresno, USA), Ph.D. (Development Communication: Macquarie University, Australia)

Mr. Pakawat Suphanakhan, B.Ed. (Education Technology: Naresuan University)

Ms. Ranitar Charitkul, B.A. (Film & 3D Multimedia: Otago School of Art, New Zealand)

Mr. Jason Etienne, B.A (Hons) (Film & Video Production: Kent Institute of Art and Design)

Ms. Sarunya Noithai, B.A. (Economics: St. Mary's College of Maryland, USA), M.A. (Organizational Management: University of Phoenix, USA)

Mr. Nic Dunlop

Mr. Norachai Nanthakij, B.F.A (Communication Art : Illinois Wesleyan University, Bloomington, IL), M.F.A (Graphic Design/Advertising: Savannah College of Art and Design, Savannah, GA)

Ms. Chanokmont Raksakiati, B.A. (Visual Communication Design: Rangsit University), M.F.A (Computer Graphics Design: Rochester institute of Technology) New York, USA.

| RESEARCH INTERESTS |

Communication Design Program

Contemporary design practice and analysis.

Specific topics in the area of Communication Design, such as:

- Publication design
- Brand management, Integrated branding programs

- Trademark development, including Logo and Corporate identity systems
- Advertising
- Environmental and Information graphics
- Package design
- Interface/Interactive design
- Typography

Art practice in traditional and experimental media and contexts, such as:

- o Community-based and public art
- o Mixed-media sculpture and installation
- o Video and performance
- o Photo documentary
- o New media/digital art

History of art and design

Visual culture and visual literacy

International and intercultural communication facilitated through design

Entertainment Media Program

Modern and cutting-edge practices in media production of television programming, film making, and animation creations. Study of good ethical and legal procedures in context of Thai and international standards. Establish contexts via examination of theoretical and historical factors of entertainment media.

- Development of creative concepts rendered into superior scripts.
- Use of computer programs for planning and budgeting, as well as for storyboarding and all animation techniques.
- Practice of the role of producer, director, and other roles.
- Awareness of the ways filmic and animation techniques enhance emotional and informational meanings in media works.
- Discern modes of both in-studio and on-location activities.
- Utilize existing media examples as guides for new work for commercial placement on television, the Internet, and elsewhere.
- Gain command of historic and theoretical factors of media, as well as ethical practices.
- Study ways of presentation of entertainment media in an educational setting.

COMMUNICATION DESIGN MAJOR

| DEGREE OFFERED |

Bachelor of Arts (Communication Design)

B.A. (Communication Design)

| THE FIELD |

Communication Design involves working with art and design and the latest computer software to communicate ideas and messages to targeted audiences. Communication Designers are visual thinkers who enjoy solving problems who are excited by contemporary culture.

The Communication Design Program (CDP) is a new four-year Bachelor of Arts program at Mahidol University International College. The program stresses innovation and criticism, building on a strong foundation of universal design principles and skills. Students gain practical experience, including awareness of current industry practices. CDP graduates will have developed a professional portfolio of personally directed design work in preparation for a design career or for application to a Master's Degree program. CDP graduates will be versatile and adaptable in the design field and able to work in several areas of Communication Design, including advertising, graphic design, interactive design, illustration, package design, publication design and environmental graphic design.

| CAREER OPPORTUNITIES |

- Advertising Agency
- Graphic Design Firm
- Publication Design Firm
- Exhibition, Interior Design or Architecture Firm
- Interactive, Multimedia or Web-Producing Company
- In-House Art and Design Department

| CURRICULUM STRUCTURE |

Courses	Credits
General Education Courses	48
Core Courses	28
Required Major Courses	80
Elective Major Courses	24
Free Elective Courses	8
TOTAL	188

| COURSE LIST |

General Education	48 credits
English Communication	16 credits
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)
ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)
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 243 Belief Systems in English Usage	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	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 without interruption beginning in their first trimester of enrollment. Students may then select any 200+ level English course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences	8 credits
ICNS 105 Basic Mathematics	4 (4-0-8)
ICNS 111 Fundamental Biology	4 (4-0-8)
ICNS 121 Fundamental Chemistry	4 (4-0-8)

ICNS	131	Fundamental Physics	4 (4-0-8)
ICNS	141	Computer Essentials	4 (3-2-7)
ICNS	142	Introduction to Internet Technology	4 (3-2-7)
ICNS	152	Southeast Asian Ecology	4 (4-0-8)
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 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
ICNS	256	Sustainable Development	4 (4-0-8)
ICNS	257	Environmental Issues: Past, Present and Future	4 (4-0-8)

Humanities **12 credits**

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	106	Moral and Ethical Studies*	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM	140	Elements of Art Theory*	4 (4-0-8)
ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Intermediate Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)
ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: TIM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	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	104	Physical Education: Pistol and Rifle	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	108	Physical Education: Snooker	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	120	Physical Education: Aikido	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)

Major Courses **132 credits**

Core Courses			28 credits
ICCD	100	Observational Drawing	4 (0-8-4)
ICCD	101	Perspective Drawing	4 (0-8-4)
ICCD	110	Visual Dynamics I	4 (0-8-4)
ICCD	111	Visual Dynamics II	4 (0-8-4)
ICCD	120	Space, Form and Materials I	4 (0-8-4)
ICCD	220	Space, Form and Materials II	4 (0-8-4)
ICCD	230	Visual Statement	4 (0-8-4)

Required Major Courses			80 credits
ICCD	240	Typography I	4 (0-8-4)
ICCD	241	Typography II	4 (0-8-4)
ICCD	242	Design Technology I	4 (0-8-4)
ICCD	243	Design Technology II	4 (0-8-4)
ICCD	244	Communication Design I	4 (0-8-4)
ICCD	245	Communication Design II	4 (0-8-4)
ICCD	340	Design Technology III	4 (0-8-4)
ICCD	350	Advertising	4 (0-8-4)
ICCD	351	Environmental Graphics	4 (0-8-4)
ICCD	352	Integrated Branding	4 (0-8-4)
ICCD	360	Graphic Design History	4 (4-0-8)
ICCD	370	Professional Writing for Designers	4 (4-0-8)
ICCD	380	Communication Design Practicum	4 (0-8-4)
ICCD	440	Senior Seminar: Thesis Research and Development	4 (4-0-8)
ICCD	470	Professional Ethics	4 (4-0-8)
ICCD	471	Senior Writing Seminar	4 (4-0-8)
ICCD	472	Professional Portfolio Development and Presentation	4 (4-0-8)
ICCD	490	Communication Design Thesis I	4 (0-8-4)
ICCD	491	Communication Design Thesis II	4 (0-8-4)
ICCD	492	Public Exhibition	4 (0-8-4)

Elective Courses			24 credits
ICCD	306	Intermediate Observational Drawing	4 (0-8-4)
ICCD	356	Information Graphics	4 (0-8-4)
ICCD	357	Animation	4 (0-8-4)
ICCD	358	Web Design	4 (0-8-4)
ICCD	366	History of Modern Design	4 (4-0-8)
ICCD	376	Communication Design Materials and Processes	4 (4-0-8)
ICCD	377	Critical Issues in Communication Design	4 (4-0-8)
ICCD	416	Printmaking	4 (0-8-4)
ICCD	426	Hand-made Books	4 (0-8-4)
ICCD	456	Package Design	4 (0-8-4)
ICCD	457	Illustration	4 (0-8-4)
ICCD	466	History of Advertising	4 (4-0-8)
ICCD	476	Green Design Seminar	4 (4-0-8)
ICCD	486	Advanced Communication Design Practicum	4 (0-8-4)

Free Elective Courses **8 credits**

Communication Design students can take any courses offered by MUIC as a free elective.

ENTERTAINMENT MEDIA PRODUCTION PROGRAM

| DEGREES OFFERED |

Bachelor of Arts (Animation Production)

B.A. (Animation Production)

Bachelor of Arts (Film Production)

B.A. (Film Production)

Bachelor of Arts (Television Production)

B.A. (Television Production)

| THE FIELD |

The Entertainment Media Program offers a core education in modern media creation and use, as well as intensive hands-on courses in each of the specific majors, namely, Film Production, Television Production, and Animation Production. As they advance, students are challenged to conceptualize shows, write scripts, create storyboards, plan productions and practice the roles of the director, producer, camera person, sound engineer, editor and animator. The courses are taught within the context of aesthetics, history, theory and personal expression, as is expected of a true university education.

Our students benefit from a faculty that includes visiting experts as well as a full-time faculty of specialists in each area of media creation, all well-trained both in the aesthetic and technical aspects of production.

| CAREER OPPORTUNITIES |

- Entertainment media producers, directors, animators, scriptwriters, etc., working in regional and global media industries.
- Entertainment media entrepreneurs.
- Media research, media policy development and management.
- Graduate School in Media and Communication Studies, Television Studies, Television and Video, Television Production, Film Studies, Film Production, Technology and New Media, Mass Communication, TV Management, Entertainment Management, Computer Graphic Design, Technology Education, etc. (within Thailand and internationally).
- MBA, MA in Sociology, Humanities, International Marketing, etc. (within Thailand and internationally)

| CURRICULUM STRUCTURE |

Courses	Credits
General Education Courses	48
Core Courses in Entertainment Media	32
Required Major Courses	76
Elective Major Courses	16
Free Elective Courses	8
TOTAL	180

| COURSE LIST |

General Education Courses **48 credits**

English Communication **16 credits**

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)
ICCM 204	Creative Writing	4 (4-0-8)

Natural Sciences **8 credits**

ICNS 105	Basic Mathematics *	4 (4-0-8)
ICNS 141	Computer Essentials	4 (3-2-7)
ICNS 142	Internet Technology	4 (3-2-7)
ICNS 161	General Geology	4 (4-0-8)
ICNS 162	Southeast Asian Geography	4 (4-0-8)

** Recommended for Entertainment Media Production Program*

Humanities **12 credits**

ICHM 105	Music Appreciation *	4 (4-0-8)
ICHM 106	Moral and Ethical Studies	4 (4-0-8)
ICHM 141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM 142	Art Appreciation II (18 th century - Present) *	4 (4-0-8)
ICHM 143	Introduction to Photography *	4 (2-4-8)
ICHM 206	Ethics and Technology	4 (4-0-8)
ICHM 216	Tragedy and Comedy in Literature	4 (4-0-8)
ICHM 218	Film Studies	4 (4-0-8)
ICHM 219	20th Century Philosophy	4 (4-0-8)
ICHM 222	Advanced Music Appreciation	4 (4-0-8)
ICHM 223	Thai Arts	4 (4-0-8)
ICHM 224	Introduction to Thai Music	4 (2-2-5)
ICHM 225	The Western Classical Ideal	4 (4-0-8)
ICHM 241	Introduction to Drawing	4 (2-4-8)
ICHM 242	Intermediate Drawing	4 (2-4-8)

** Recommended for Entertainment Media Production Program*

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	121	Southeast Asian Studies	4 (4-0-8)
ICSS	221	Thai Society and Thai Culture	4 (4-0-8)
ICSS	222	Thai History	4 (4-0-8)
ICSS	332	Introduction to Human Rights	4 (4-0-8)

* Recommended for Entertainment Media Production Program

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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)
ICPE	122	Selected Topics in Sports	1 (0-3-1)

* Recommended for Entertainment Media Production Program

Entertainment Media Courses			124 credits
Entertainment Media Core Courses			32 credits
ICEM	101	Media Production	4 (4-0-8)
ICEM	104	Visual Communication I	4 (4-0-8)
ICEM	105	Visual Communication II	4 (4-0-8)
ICEM	202	Storytelling	4 (4-0-8)
ICEM	204	Audio Communication	4 (4-0-8)

ICEM	205	Basic Acting Techniques	4 (0-8-4)
ICEM	301	Introduction to Media Research	4 (4-0-8)
ICEM	302	Media Law and Ethics	4 (4-0-8)

1. Animation Production Major

Required Courses			76 credits
ICAM	101	Introduction to Animation	4 (4-0-8)
ICAM	102	Color Theory and Application	4 (0-8-4)
ICAM	103	Drawing for Animation I	4 (0-8-4)
ICAM	104	2D Animation I	4 (0-8-4)
ICAM	201	Character Design I	4 (0-8-4)
ICAM	202	Drawing for Animation II	4 (0-8-4)
ICAM	203	Storyboarding I	4 (4-0-8)
ICAM	204	2D Animation II	4 (0-8-4)
ICAM	205	Computer Programs for Animation	4 (0-8-4)
ICAM	206	Storyboarding II	4 (4-0-8)
ICAM	301	Layout Design I	4 (0-8-4)
ICAM	302	3D Animation I	4 (0-8-4)
ICAM	303	3D Animation II	4 (0-8-4)
ICAM	304	Character Design II	4 (0-8-4)
ICAM	398	Professional Internship in Animation Production	4 (0-12-4)
ICAM	380	Selected Topics in Animation Production	4 (0-8-4)
ICAM	498	Animation Production Final Project I	4 (0-12-4)
ICAM	499	Animation Production Final Project II	8 (0-24-8)

Elective Courses			16 credits
ICAM	351	Animation Production Management	4 (4-0-8)
ICAM	352	Layout Design II	4 (0-8-4)
ICAM	353	Painting I	4 (0-8-4)
ICAM	354	Painting II	4 (0-8-4)
ICAM	355	Computer and Video Games	4 (4-0-8)
ICAM	356	Media Compositing	4 (0-8-4)
ICAM	370	Seminar in Animation Production	2 (2-0-4)
ICAM	381	Independent Study in Animation Production	4 (0-8-4)
ICAM	399	International Field Study in Animation Production	4 (0-12-4)
ICTV	101	TV Production Techniques	4 (0-8-4)
ICTV	102	Multi-Camera Production	4 (0-8-4)
ICTV	201	TV Production Design	4 (0-8-4)
ICTV	202	TV On-Location Production	4 (0-8-4)
ICTV	204	TV Scriptwriting	4 (4-0-8)
ICFM	101	Film Production	4 (0-8-4)

ICFM	102	Introduction to Film	4 (4-0-8)
ICFM	201	Cinematography	4 (0-8-4)
ICFM	203	Scriptwriting for Film	4 (4-0-8)
ICFM	204	Film Post-Production I	4 (0-8-4)
ICFM	251	Music Video Production	4 (0-8-4)
ICFM	304	Sound in Film	4 (0-8-4)
ICFM	351	Film Criticism	4 (4-0-8)
ICFM	402	Film Producing	4 (4-0-8)

Free Elective Courses**8 credits****2. Film Production Major****Required Courses****76 credits**

ICFM	101	Film Production	4 (0-8-4)
ICFM	102	Introduction to Film	4 (4-0-8)
ICFM	201	Cinematography	4 (0-8-4)
ICFM	202	Film Analysis	4 (4-0-8)
ICFM	203	Scriptwriting for Film	4 (4-0-8)
ICFM	204	Film Post-Production I	4 (0-8-4)
ICFM	301	Acting for Film	4 (0-8-4)
ICFM	302	Film Directing	4 (0-8-4)
ICFM	303	Advanced Film Production	4 (0-8-4)
ICFM	304	Sound in Film	4 (0-8-4)
ICFM	305	Film Post-Production II	4 (0-8-4)
ICFM	351	Film Criticism	4 (4-0-8)
ICFM	380	Selected Topics in Film Production	4 (0-8-4)
ICFM	401	Film Editing	4 (0-8-4)
ICFM	402	Film Producing	4 (4-0-8)
ICFM	455	Professional Internship in Film Production	4 (0-12-4)
ICFM	498	Film Production Final Project I	4 (0-12-4)
ICFM	499	Film Production Final Project II	8 (0-24-8)

Elective Courses**16 credits**

ICFM	251	Music Video Production	4 (0-8-4)
ICFM	370	Seminar in Film Production	2 (2-0-4)
ICFM	306	Film Laboratory Procedures	4 (4-0-8)
ICFM	381	Independent Study in Film Production	4 (0-8-4)
ICFM	399	International Field Study in Film Production	4 (0-12-4)
ICTV	101	TV Production Techniques	4 (0-8-4)
ICTV	102	Multi-Camera Production	4 (0-8-4)
ICTV	201	TV Production Design	4 (0-8-4)

ICTV	202	TV On-Location Production	4 (0-8-4)
ICTV	352	Wardrobe for TV and Film	4 (0-8-4)
ICTV	353	Make-up for TV and Film	4 (4-0-8)
ICTV	355	Special Effects Make-up for TV and Film	4 (4-0-8)
ICAM	101	Introduction to Animation	4 (4-0-8)
ICAM	102	Color Theory and Application	4 (0-8-4)
ICAM	103	Drawing for Animation I	4 (0-8-4)
ICAM	201	Character Design I	4 (0-8-4)
ICAM	203	Storyboarding I	4 (4-0-8)
ICAM	356	Media Compositing	4 (0-8-4)

3. Television Production Major

Required Courses			76 credits
ICTV	101	TV Production Techniques	4 (0-8-4)
ICTV	102	Multi-Camera Production	4 (0-8-4)
ICTV	201	TV Production Design	4 (0-8-4)
ICTV	202	TV On-Location Production	4 (0-8-4)
ICTV	203	TV Pre-Production	4 (4-0-8)
ICTV	204	TV Scriptwriting	4 (4-0-8)
ICTV	205	TV Production Procedures	4 (0-8-4)
ICTV	206	TV Scenery and Props Design	4 (4-0-8)
ICTV	301	TV Post Production	4 (0-8-4)
ICTV	302	TV News Gathering and Reporting	4 (0-8-4)
ICTV	303	TV Marketing and Sales	4 (4-0-8)
ICTV	304	Directing TV Drama	4 (0-8-4)
ICTV	305	Documentary Program Production	4 (0-8-4)
ICTV	380	Selected Topics in TV Production	4 (0-8-4)
ICTV	401	TV Drama	4 (0-8-4)
ICTV	455	Professional Internship in TV Production	4 (0-12-4)
ICTV	498	TV Production Final Project I	4 (0-12-4)
ICTV	499	TV Production Final Project II	8 (0-24-8)
Elective Courses			16 credits
ICTV	351	TV Drama Scriptwriting	4 (0-8-4)
ICTV	352	Wardrobe for TV and Film	4 (0-8-4)
ICTV	353	Make-up for TV and Film	4 (4-0-8)
ICTV	354	News and Current Affairs Program	4 (4-0-8)
ICTV	355	Special Effects Make-up for TV and Film	4 (4-0-8)
ICTV	370	Seminar in Television Production	2 (2-0-4)
ICTV	399	International Field Study in TV Production	4 (0-12-4)
ICTV	381	Independent Study in TV Production	4 (0-8-4)

ICFM	101	Film Production	4 (0-8-4)
ICFM	102	Introduction to Film	4 (4-0-8)
ICFM	201	Cinematography	4 (0-8-4)
ICFM	203	Scriptwriting for Film	4 (4-0-8)
ICFM	204	Film Post-Production I	4 (0-8-4)
ICFM	251	Music Video Production	4 (0-8-4)
ICFM	351	Film Criticism	4 (4-0-8)
ICFM	402	Film Producing	4 (0-8-4)
ICAM	101	Introduction to Animation	4 (4-0-8)
ICAM	102	Color Theory and Application	4 (0-8-4)
ICAM	103	Drawing for Animation I	4 (0-8-4)
ICAM	201	Character Design I	4 (0-8-4)

Free Elective Courses**8 credits**

Entertainment Media students can take any courses offered by MUIC as a free elective.



SCIENCE

DIVISION

The Science Division offers 9 major programs in Applied Mathematics, Biological Science, Chemistry, Computer Science, Environmental Science, Food Science and Technology, Nursing Science, Physics, and Computer Engineering.

| DIVISION CHAIRMAN |

Assistant Professor Dr. Pakorn Bovonsombat, B.A. (Chemistry; Vassar College, USA), M.A. (Chemistry; Vassar College), M.A. (Chemistry; Columbia University, USA), Ph.D. (Organic Chemistry; New York University, USA), Postdoctoral (Organic Chemistry; New York University), Postdoctoral Fellow (Photochemistry; The Rockefeller University, USA)

| PROGRAM DIRECTORS |

| Applied Mathematics Program |

Associate Professor Dr. Chinda Tangwongsan, B.A. (University of Illinois, USA), M.A. (Mathematics; University of Illinois), Ph.D. (Mathematics; Southern Illinois University, USA)

| Biological Sciences Program |

Associate Professor Dr. Prayad Pokethitiyook, B.Sc. (Biology; Mahidol University), M.Sc. (Environmental Biology; Mahidol University), M.Sc. (Environmental Science and Engineering; Virginia Technology, USA), Ph.D. (Chemical Engineering; University of Melbourne, Australia)

| Chemistry Program |

Assistant Professor Dr. Pakorn Bovonsombat, B.A. (Chemistry; Vassar College, USA), M.A. (Chemistry; Vassar College), M.A. (Chemistry; Columbia University, USA), Ph.D. (Organic Chemistry; New York University, USA), Postdoctoral (Organic Chemistry; New York University), Postdoctoral Fellow (Photochemistry; The Rockefeller University, USA)

| Computer Engineering Program |

Assistant Professor Thanadol Pritranan, B.Eng. (Electronics; King Mongkut's Institute of Technology, Ladkrabang), M.Sc. (Computation; University of Manchester Institute of Science and Technology, UK)

| Food Science and Technology Program |

Assistant Professor Dr. Anadi Nitithamyong, B.Sc. (Food Technology; Chulalongkorn University), M.Sc. (Food Science; University of Wisconsin-Madison, USA), Ph.D. (Food Science; University of Wisconsin-Madison)

| Natural Science Program |

Assistant Professor Titima Champirat, B.S. (Nursing, Cert. in Midwifery; Mahidol University), M.S. (Maternity & Child Health Nursing; Mahidol University)

| PROGRAM COORDINATOR |**| Computer Science Program |**

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| Environmental Science Program |

Assistant Professor Dr. Patana Thavipoke, B.S. (Fisheries; Kasetsart University), M.S. (Environmental Science; Florida Institute of Technology, USA), Ph.D. (Environmental Science and Technology; Technical University Hamburg-Harburg, Germany)

| Physics Program |

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| SENIOR PROGRAM COORDINATOR |**| Natural Science Program |**

Mr. Laird Allan, B.S. (Biology; Bates College, USA), M.S. (Marine Biology; University of Delaware, USA)

| FACULTY MEMBERS |**| Full-Time |**

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| **Part-Time** |

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Dr. Udom Robkob, B.Sc. (Radiation Technology: Mahidol University), M.Sc. (Physics: Chulalongkorn University), Ph.D. (Physics: Chulalongkorn University): Faculty of Science, Mahidol University

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Professor Pornsawan Visoothiviseth, B.Sc. (Biology), M.S. (Microbiology), Ph.D. (Plant Pathology): Faculty of Science, Mahidol University

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Ms. Busaba Yongchaitrakul, B.S. (Mathematics and Computer), M.B.A. (Finance): American International Assurance

| RESEARCH INTERESTS AND RECENT PUBLICATIONS |

Mr. Laird Allan*Research Interests:*

- Ecology and physiology of scleractinian corals; coral reef restoration.
- Artificial reef substrates for larval settlement, nutritional requirements of *Fungia* (mushroom corals), artificial reef construction process

Mr. Poramin Bheganan*Research Interests:*

- System Development Methodology
- Information Technology and Enterprise Resource Planning

Dr. Ramesh Boonratana*Research Interests:*

- Primate ecology & behavior
- Wildlife ecology & behavior
- Conservation & sustainable use of biodiversity & natural resources
- Protected area planning & management
- Co-Management of biodiversity & natural resources
- Sustainable tourism, ecotourism, & community-based tourism

Recent Publications:

Boonratana, R. Community-based Tourism in Thailand: The Need and Justification for an Operational Definition. *Kasetsart Journal Social Science*. 2010; 31(2): 280-9.

Duckworth, JW.; **Boonratana, R.**; W.G. Robichaud.; R.J. Timmins. A Review of François's Leaf Monkey *Trachypithecus francoisi* (sensu lato) in Lao PDR. *Primate Conservation*. 2010; 25: 61-79.

Boonratana, R. Sighting of the Bornean Ferret Badger *Melogale everetti* in the Kinabatangan floodplains, and implications of its apparent lowland distribution. *Small Carnivore Conservation*. 2010; 42: 22-4.

Assistant Prof. Dr. Pakorn Bovonsombat*Research Interests:*

- Hypervalent iodine Chemistries
- Selective C-O Ullman coupling reaction
- Geometry-specific α -Halogenations of linear enones and enals
- Regioselective halogenations of phenols
- Rearrangement chemistry of Alkynols

Recent Publications:

Bovonsombat, P.; Ali, R.; Khan, C.; Leykajakul, J.; Pla-on, K.; Aphimanchindakul, S.; Pungcharoenpong, N.; Timsuea, N.; Arunrat, A.; Punpongjareorn, N. Facile p-toluenesulfonic acid-promoted para-selective monobromination and chlorination of phenol and analogues. *Tetrahedron*. 2010; 66: 6928-35. (ISI Impact factor: 3.629)

Bovonsombat, P.; Leykajakul, J.; Khan, C.; Pla-on, K.; Krause, M. M.; Khanthapura, P.; Ali, R.; Doowa, N. Regioselective iodination of phenol and analogues using N-iodosuccinimide and p-toluenesulfonic acid. *Tetrahedron Letters* 2009; 50: 2664-7. (ISI Impact factor: 2.660)

Bovonsombat, P.; Khanthapura, P.; Krause, M. M.; Leykajarakul, J. Facile syntheses of 3-halo and mixed 3,5-dihalo analogues of N-acetyl-L-tyrosine via sulfonic acid-catalysed regioselective monohalogenation. *Tetrahedron Letters* 2008; 49: 7008-11. (ISI Impact factor: 2.538)

Bovonsombat, P.; Rujiwarangkul, R.; Bowornkiengkai, T.; Leykajarakul, J. α -Bromination of linear enals and cyclic enones. *Tetrahedron Letters*. 2007; 48: 8607-10. (ISI Impact factor: 2.615)

Bovonsombat, P.; Khanthapura, P.; Leykajarakul, J. Recent Development in Alkynol Chemistry: Electrophilic Iodonium-Induced Rearrangements. *Silpakorn University Science and Technology Journal*. 2007; 1(2): 39-55.

Associate Professor Dr. Saovane Chancharoensin

Research Interests:

- Production and application microbial enzyme and cells
- Enzyme purification and characterization

Recent Publications:

Chancharoensin, S.; Luechai, S.; Banditwattanawong, C. Media Development for Biomass Production of Antifungal Strains of *Pseudomonas aeruginosa*. *Int J Appl Agric Res*. 2010; 5: 669-77.

Sutthirak, P.; Assavanig, A.; **Dharmsthiti, S.;** Lertsiri, S. Changes in the stability and kinetic parameters up on glycation of thermostable α -amylase from *Bacillus subtilis*. *J Food Biochem*. 2010; 34: 1157-71. (ISI Impact factor: 0.779)

Cha, J.Y.; Dawar, N.; Luechai, S.; **Dharmsthiti, S.** Production of non-starch-polysaccharide carbohydrase from solid state fermentation of *Aspergillus niger* AK10. *Asean J Food Agro-Ind*. 2010; 3(1): 108-19.

Dharmsthiti, S.; Luechai, S. Purification and characterization of asparaginase from solid state culture of *Aspergillus niger* AK10. *Int J Biotechnol Biochem*. 2010; 6: 1083-92.

Luechai, S.; **Dharmsthiti, S.** Cultivation of *Lactobacillus plantarum* KV1 in whey-containing medium for use as starter in vegetable fermentation. *Int J Biotechnol Biochem*. 2010; 6: 877-88.

Sutthirak, P.; **Dharmsthiti, S.;** Boonprasop, S. Bacterial Quality of Oyster (*Cassostrea belcheri*) in Suratthani Province. The 2nd Science Research Conference; 2009; Pitsanulok, Thailand

Sopalun, K.; Subunpong, A.; **Dharmsthiti, S.** Isolation of phytase and bacteriocin producing lactic acid bacteria from fermented food for potential use as probiotics. International Conference on Life Science 2008: Well-being for the Human Race; 2008; Bangkok, Thailand

Sri-akkharin, W.; **Dharmsthiti, S.** Extracellular phytase production from *Pseudomonas* sp. strain K2. *Thai Journal of Biotechnology* 2007; 7: 45-51.

Sri-akkharin, W.; Charakorn, W.; Luchai, S.; **Dharmsthiti, S.** Purification and characterization of *Pseudomonas* phytase with broad substrate specificity. *Thai Journal of Biotechnology* 2006; 7: 6-11.

Associate Professor Chulathida Chomchai, MD

Recent Publications:

จุฬิธา โฉมฉาย. Lethal Poisoning. In: ประพันธ์ อ, จารุพิมพ์ ส, วาณี ว, สุรัชชัย ล, editor. *Acute Care Pediatrics* November 2010; Siriraj Hospital; 2010. p. 480-88.

จุฬิธา โฉมฉาย. Accidental Iron Ingestion. In: สุรัชชัย ก, editor. *Practical Pediatrics for Practitioners*; 13-15 มกราคม 2010.

Kriengsoontornkij, W.; Homcheon, B.; **Chomchai C.;** Neamsomboon, W. Accuracy of pediatric triage at Siriraj Hospital, Bangkok, Thailand. *J Med Assoc Thai*. 2010; 93(10): 1172-6.

In-iw S.; Manoboriboon, B.; **Chomchai C.** A comparison of body-image perception, health outlook and eating behavior

in mildly obese versus moderately-to-severely obese adolescents. *J Med Assoc Thai*. 2010; 93(4): 429-35.

Chomchai, C. Environmental Pollutions and the Health of Children: a Pediatric Toxicologist's Perspective. The 5th International Congress of Asian Society of Toxicology; September 10-13; Taipei Veterans General Hospital, Taipei, Taiwan 2009. p. abstract #36.

Woolf AD.; Hussain, J.; McCullough, L.; Petranovic, M.; **Chomchai C.** Infantile lead poisoning from an Asian tongue powder: A case report & subsequent public health inquiry. *Journal of Medical Toxicology: Informa Healthcare*. 2008: 1- 4.

Chomchai, C.; Tiawilai, A. Fetal poisoning after maternal paraquat ingestion during third trimester of pregnancy: case report and literature review. *J Med Toxicol*. 2007; 3(4): 182-6.

จุฬารัตนา โฉมฉาย. ภาวะพิษเฉียบพลันในผู้ป่วยเด็ก. In: วาณี ว, จารุพิมพ์ ส. editor. กรุงเทพฯ 2006. p. Chapter 38

Manaboriboon, B.; Sujaritpongsa, S.; **Chomchai C.** Sexual Attitudes of adolescent girls after an interactive seminar on sexuality. *Siriraj Medical Journal*. 2006; 59(2): 654-57.

Chomchai, C.; Tanongsakakul, W.; Thanyong, W. Theophylline overdose in premature neonate: a case report and review of pharmacokinetics. *Siriraj Medical Journal*. 2006; 58(9): 117-8.

Chomchai, C.; Sujaritpongsa, S.; Chinda, C.; Manaboriboon, B. The added efficacy of paracetamol in tepid sponging for fever reduction. *Siriraj Medical Journal*. 2006; 58: 973-6.

Dr. Edward Grand

Research Interests:

- Fungal Bioremediation and Biorecovery
- Mushroom cultivation on agricultural wastes
- Fungal systematics

Recent Publications:

Grand, E.A.; H, K.W.; Petersen, R.H. Relationships within *Lentinus* subg. *Lentinus* (Polyporales, Agaricomycetes), with emphasis on sects *Lentinus* and *Tigrini*. *Mycological Progress*. 2010. (ISI Impact factor: 1.082)

Sumaiyah, A.; Noorlidah, A.; Vikineswary, S.; **Grand, E.A.**, editor. *Basidiomycota: Distribution and new records of Lentinus*. *Malaysian Fungal Diversity 2007*; Mushroom Research Centre, University of Malaya and Ministry of Natural Resources and Environment, Malaysia.

Associate Professor Dr. Chanida Hansawasdi

Research Interests:

- Studies of structure, function and application of active compounds from Thai Herbs.
- Functional Foods: Chemistry and Processing.
- Postharvest technologies of fruits: Enzyme, chemistry and processing.
- Decision expert system for food product development.

Recent Publications:

Boonyanuphap, J.; **Hansawasdi, C.** Spatial distribution of Beta glucan containing wild mushroom communities in subtropical dry forest, Thailand. *Fungal Diversity. JCR*. 2011; 46: 29-42. (ISI Impact factor: 3.803)

Jaiboon, V.; Boonyanuphap, J.; Suwansri, S.; Ratanatraiwong, P.; **Hansawasdi, C.** Alpha amylase inhibition and roasting time of local vegetables and herbs prepared for diabetes risk reduction Chili paste. *Asian Journal of Food and Agro-Industry*. 2010; 3(1): 01-12.

Hansawasdi, C.; Meepayung, P.; Chaiprasart, P. Canned Mango Juice Processing from *Mangifera indica* Linn. cv.

Nahm-dawg-mai. *Acta Horticulturae*. 820: 775-80.

Hansawasdi, C.; Siyanant, M.; Chaiprasart, P. The Production of Mango chips from *Mangifera indica* Linn. cv. Nahm-dawg-mai. *Acta Horticulturae*. 820: 755-60.

Hansawasdi, C.; KemKaow, M.; Chaiprasart, P. The Production of Canned Mango Slices in Syrup from *Mangifera indica* Linn. cv. Nahm-dawg-mai. *Acta Horticulturae*. 820: 769-74.

Hansawasdi, C.; Kawabata, J. α -Glucosidase inhibitory effect of mulberry (*Morus alba*) leaves on Caco-2. *Fitoterapia*. 2006; 77: 568-73. (ISI Impact factor: 0.908)

Chaiprasart, P.; **Hansawasdi, C.**; Pipattanawong, N. The effect of chitosan coating and calcium chloride treatment on postharvest qualities of strawberry fruits (*Fragaria x ananassa*). *Acta Horticulturae*. 2006; 708: 301-6.

Hansawasdi, C.; Chaiprasart, P.; Rithiudom, S. Quality and antioxidant activity changes during low-temperature storage of strawberry fruits. *Acta Horticulturae*. 2006; 708: 337-42.

Dr. Chayanant Hongfa

Recent Publications:

Su H.-L.; **Hongfa, C.**; Bazzi, H. S.; Bergbreiter, D. E. Polyisobutylene Phase-Anchored Ruthenium Complexes. *Macromol Symp*. 2010; 297: 25-32. (ISI Impact factor: 0.913)

Bergbreiter, D.E.; Hobbs, C.; **Hongfa C.** Polyolefin-Supported Recoverable/Reusable Cr(III)-Salen Catalysts. *J Org Chem*. 2010; 76: 523-33. (ISI Impact factor: 4.219)

Chance, B.S.; Mostafa, A.; Nair, A.; **Hongfa, C.**; Bazzi, H. S. Charge-Transfer Piperazine-containing Polymeric Systems via Ring-opening Metathesis Polymerization. *J Polym Sci Part A: Polym Chem*. 2009; 47: 5034-43. (ISI Impact factor: 3.971)

Bergbreiter, D.E.; Tian, J.; **Hongfa, C.** Using Soluble Polymer Supports to Facilitate Organic Synthesis. *Chem Rev*. 2009; 109: 530-82. (ISI Impact factor: 35.957)

Hongfa, C.; Su H.-L.; Bazzi, H. S.; Bergbreiter, D. E. Polyisobutylene-Anchored N-Heterocyclic Carbene Ligands. *Org Lett*. 2009; 11: 665-7. (ISI Impact factor: 5.42)

Bergbreiter, D.E.; Hobbs, C.; Tian, J.; Koizumi, H.; Su H.-L.; **Hongfa C.** Synthesis of Aryl-Substituted Polyisobutylenes as Precursors for Ligands for Greener, Phase Selectively Soluble Catalyst. *Pure Appl Chem*. 2009; 81: 1981-90. (ISI Impact factor: 1.495)

Hongfa, C.; Tian, J.; Andreatta, J.; Darensbourg, D. J.; Bergbreiter, D. E. A Phase Separable Polycarbonate Polymerization Catalyst. *Chem Commun*. 2008; 8: 975-7. (ISI Impact factor: 5.504)

Hongfa, C.; Tian, J.; Bazzi, H. S.; Bergbreiter, D. E. Heptane-Soluble Ring-Closing Metathesis Catalysts. *Org Lett*. 2007; 9: 3259-61. (ISI Impact factor: 5.42)

Dr. Nirutchara Laohaprasit

Research Interests:

- Effect of processing on volatile compounds in food products
- Volatile compounds in natural products

Recent Publications:

Laohaprasit, N.; Ambadipudi, D. S.; Srzednicki, G. Optimisation of extraction conditions of volatile compounds in 'Nam Dok Mai' mangoes. *International Food Research Journal*. 2011; 18(3): 1000-06.

Thankitsunthorn, S.; Thawornphiphatdit, C.; **Laohaprasit, N.**; Srzednicki, G. Effects of drying temperature on quality of Indian Gooseberry powder. *International Food Research Journal*. 2009; 16(3): 357-62.

Sunthonvit, N.; Srzednicki. G.; Craske. J. Effects of drying treatments on the composition of volatile compounds in dried nectatrine. *Drying Technology*. 2007; 25: 877-81.

Dr. Krittaya Leelawong

Research Interest:

- Interactive learning environments; learning-by-teaching systems

Recent Publications:

Leelawong, K.; Biswas, G. Designing Learning by Teaching Agents: The Betty's Brain System. *International Journal of Artificial Intelligence in Education*. 2008; 28(3): 181-208.

Leepaisalsuwanna, U.; Suwannakul, T.; **Leelawong, K.;** et al. editor. In Search for an Ideal Campus Information Service in Undergraduate Students' Opinion," presented at the Enhancing Learning Experiences in Higher Education. International Conference; 2010; Hong Kong.

Dr. Boonyanit Mathayomchan

Research Interests:

- System Development
- Mobile programming

Dr. Wayne Phillips

Research Interests:

- Coral reef ecology
- Coral reef conservation and Management
- Coral physiology, productivity and growth
- Using chlorophyll fluorescence to investigate coral primary productivity

APPLIED MATHEMATICS MAJOR

| 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. Since its origins, it has proved to be an indispensable tool for understanding the world around us. Mathematics is the language of modern science and basic training in the discipline. It is essential for those who want to understand the important scientific developments of our time.

MUIC offers a mathematics major that combines the benefits of a well-rounded general education in science and humanities with applied mathematics to produce high caliber graduates capable of undertaking graduate studies, secondary school teaching and careers in IT related professions, finance, banking and actuarial science.

Mathematics is the study of and search for patterns and permeates almost every aspect of life. It plays a fundamental role both in the sciences and in the world of commerce and finance. It also provides the tools and skills we need for dealing with the most abstract concepts. An understanding of mathematics is also extremely 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 |

Excellent career opportunities for bi-lingual and multi-lingual applied mathematics graduates exist. Even in areas where the application of mathematics may not be obvious, a mathematical education provides training in logical and analytical skills, which are invaluable in many industries. Apart from the obvious careers in teaching and science, opportunities exist in insurance companies, industry and commerce, economics, genetics, meteorology and forestry.

| CURRICULUM STRUCTURE |

| Applied Mathematics Major |

Courses	Credits
General Education Courses	52
Core Science Courses	32
Required Major Courses	60
Elective Major Courses	36
Free Elective Courses	8
TOTAL	188

| **COURSE LIST** |

General Education Courses **52 credits**

English Communication **16 credits**

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)
ICCM	111	Advanced English Communication I	4 (4-0-8)
ICCM	112	Advanced English Communication II	4 (4-0-8)
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	243	Belief Systems in English Usage	4 (4-0-8)
ICEG	250	Introduction to Linguistics	4 (4-0-8)
ICEG	265	Literature into Film	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 course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences **12 credits**

ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	112	Integrated Biology	4 (4-0-8)
ICNS	122	Principles of Chemistry	4 (4-0-8)
ICNS	141	Computer Essentials	4 (3-2-7)
ICNS	142	Internet Technology	4 (3-2-7)
ICNS	152	Southeast Asia Ecology	4(4-0-8)
ICNS	153	Ecosystems and Natural Resources	4 (3-2-7)
ICNS	154	Science, Technology, and Environment	4 (4-0-8)

ICNS	161	Introduction to Geology	4 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
ICNS	252	Marine Biology	4 (3-2-7)
ICNS	253	Environmental Science	4 (4-0-8)
ICNS	254	Pollution Biology	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**12 credits**

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	106	Moral and Ethical Studies*	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM	140	Elements of Art Theory*	4 (4-0-8)
ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Intermediate Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)
ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)

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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)
ICPE	122	Selected Topics in Sports	1 (0-3-1)
ICPE	123	Cycling	1 (0-3-1)

Major Courses**128 credits****Core Science Courses****32 credits**

ICMA	102	Principles of Mathematics	4 (4-0-8)
ICMA	218	Calculus for Physical Sciences	4 (4-0-8)
ICPY	132	Principles of Physics	4 (4-0-8)
ICPY	211	General Physics I	4 (4-0-8)
ICCH	210	General Chemistry I	4 (4-0-8)
ICSC	302	Scientific Research and Presentation	4 (4-0-8)
ICSC	303	Statistics	4 (4-0-8)
ICSC	304	Computer for Research	4 (3-2-7)

Required Major Courses			60 credits
ICCS	199	Computer Concepts and Fundamentals	4 (4-0-8)
ICCS	201	Computer Programming I	4 (3-2-7)
ICCS	203	Computer Programming II	4 (3-2-7)
ICMA	214	Ordinary Differential Equations	4 (4-0-8)
ICMA	219	Calculus of Several Variables	4 (4-0-8)
ICMA	222	Introduction to Mathematical Software	4 (3-2-7)
ICMA	242	Discrete Mathematics	4 (4-0-8)
ICMA	321	Linear Algebra	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	336	Numerical Methods	4 (3-2-7)
ICMA	424	Abstract Algebra	4 (4-0-8)
ICMA	444	Research Project in Applied Mathematics	6 (6-0-12)
ICMA	445	Seminar in Applied Mathematics	2 (2-0-4)

Elective Major Courses			36 credits
ICSC	301	Data Collection and Laboratory Methods	4 (3-2-7)
ICCH	333	Physical Chemistry I	4 (4-0-8)
ICCH	334	Physical Chemistry II	4 (4-0-8)
ICMA	231	Theory of Interest	4 (4-0-8)
ICMA	313	Number Theory	4 (4-0-8)
ICMA	316	Introduction to Graph Theory	4 (4-0-8)
ICMA	319	Introduction to Combinatorial Mathematics	4 (4-0-8)
ICMA	324	Real Analysis	4 (4-0-8)
ICMA	331	Special Functions	4 (4-0-8)
ICMA	333	Boundary Value Problems	4 (4-0-8)
ICMA	341	Fluid Dynamics	4 (4-0-8)
ICMA	344	Time Series Analysis	4 (4-0-8)
ICMA	346	Optimization	4 (4-0-8)
ICMA	348	Numerical Methods for Partial Differential Equations	4 (4-0-8)
ICMA	350	Probability	4 (4-0-8)
ICMA	352	Experimental Design	4 (4-0-8)
ICMA	353	Actuarial Mathematics I	4 (4-0-8)
ICMA	354	Actuarial Mathematics II	4 (4-0-8)
ICMA	355	Introduction to Operation Research	4 (4-0-8)
ICMA	356	Decision Analysis	4 (4-0-8)
ICMA	360	Sampling Techniques	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	423	Set Theory	4 (4-0-8)
ICMA	425	Introduction to Topology	4 (4-0-8)
ICMA	432	Multivariate Analysis	4 (4-0-8)
ICMA	434	Introduction to Fourier Analysis	4 (4-0-8)
ICMA	435	Regression Analysis	4 (4-0-8)
ICMA	441	Viscous Fluid	4 (4-0-8)
ICMA	450	Introduction to Mathematical Modeling	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)
ICMB	201	Macroeconomics	4 (4-0-8)
ICMB	202	Microeconomics	4 (4-0-8)
ICMB	211	Fundamental Financial Accounting	4 (4-0-8)
ICMB	363	Management Science	4 (4-0-8)
ICMB	371	Business Finance	4 (4-0-8)
ICMB	372	Financial Management	4 (4-0-8)
ICMF	376	Financial Modeling	4 (4-0-8)
ICMF	471	Financial Investment	4 (4-0-8)
ICMF	478	Financial Theory	4 (4-0-8)
ICBE	342	Intermediate Microeconomics	4 (4-0-8)
ICBE	343	Intermediate Macroeconomic	4 (4-0-8)
ICBE	344	Econometrics I	4 (4-0-8)
ICBE	441	Econometrics II	4 (4-0-8)

Free Elective Courses**8 credits**

Applied mathematics students can take courses offered by MUIC as free electives, except ICNS 101, ICNS 103, ICNS 105, ICNS 111, ICNS 121, ICNS 131, ICMA 211 and ICMA 215.

BIOLOGICAL SCIENCES MAJOR

| DEGREE OFFERED |

1. Bachelor of Science (Biological Sciences: Biology)
2. Bachelor of Science (Biological Sciences: Biomedical Science)
3. Bachelor of Science (Biological Sciences: Biotechnology)
B.Sc. (Biological Sciences)

| THE FIELD |

The Biological Science Program of MUIC offers quality education which allows students entry into a wide variety of occupations, professional degree programs and advanced research degree programs. The courses offered are surprisingly diverse for a college as small as MUIC, and are interesting and challenging. Required courses emphasize the basic principles required for all advanced programs. These principles cover every field from environmental science, population biology and regulatory biology to cell and molecular biology. The program offers three modules: Biology, Biomedical Science, and Biotechnology.

Biology is the science of life. The vast scope of its subject matter makes biology an extremely diverse field of study. This diversity stems not only from the tremendous variety of life forms with which we share our planet but also from the multiple levels of organization available for biological investigation. Given an organism, a biologist might choose to investigate how it behaves, how it fits into its ecosystem, the mechanisms by which its genes shape its appearance, what its ancestors were like, how its cells divide, how it grows and develops or how it derives energy from nourishment. Biological inquiry encompasses perspectives from the planetary to the sub-microscopic.

Biomedical science provides an understanding of the human body and the way it works. Graduates are prepared to pursue professions allied with medical research. These include areas such as human anatomy and physiology, pharmacology and toxicology, pathobiology, neurobiology, epidemiology and tropical medicine.

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.

| CAREER OPPORTUNITIES |

For many biology majors, undergraduate studies is the preliminary step in pursuing an advanced degree that will

lead to a career as a medical doctor, veterinarian, academic or scientist. A graduate degree is not, however, required to pursue a career related to biology. A bachelor's degree in biology can lead to employment in the large and growing biotechnology, health care or pharmaceutical industries. Many openings in the dynamic, high-tech fields require a degree in the life sciences.

Biology majors are likewise well prepared for careers as secondary-school science teachers and in certain government agencies, including the departments of natural resources, health departments, state or national parks, and environmental regulatory offices. Businesses and industries also hire biologists to conduct technical research, to sell scientific equipment and supplies, and to work as environmental consultants. Many students interested in medical careers major in biology as undergraduates. Teaching biology in high school or middle school is another career choice of biology majors.

The aim of the biomedical science concentration is to provide graduates with the scientific, technical, communication and teamwork skills suitable for direct entry into a wide range of biomedical careers. Graduates are able to work in industry, hospitals, medical schools or graduate programs in all fields of biological sciences and medical sciences (anatomy, physiology, microbiology, pathobiology, pharmacology). Biomedical researchers apply their scientific knowledge to a range of problems in medicine and the health sciences. Depending on their area of interest, they investigate aspects of the structure and function of the human body, disease and disease prevention.

Biotechnology graduates can pursue their careers in a number of ways i.e. , research science positions in laboratories applying biotechnology to problems in industry and agriculture; management positions in the biotechnology industry; positions at companies that are investing in biotechnology; working for law firms in biotechnology.

| CURRICULUM STRUCTURE |

| Biological Science Major |

Courses	Credits
General Education Courses	52
Core Science Courses	32
Required Major Courses	58
Elective Major Courses	34
Free Elective Courses	8
<i>Total</i>	<i>184</i>

| COURSE LIST |

General Education Courses	52 credits
English Communication	16 credits
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)
ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)
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	243	Belief Systems in English Usage	4 (4-0-8)
ICEG	250	Introduction to Linguistics	4 (4-0-8)
ICEG	265	Literature into Film	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 course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences			12 credits
ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	112	Integrated Biology	4 (4-0-8)
ICNS	141	Computer Essentials	4 (3-2-7)
ICNS	142	Internet Technology	4 (3-2-7)
ICNS	152	Southeast Asian Ecology	4 (4-0-8)
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 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
Humanities			12 credits
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	106	Moral and Ethical Studies*	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM	140	Elements of Art Theory*	4 (4-0-8)

ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Intermediate Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)
ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note 1: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

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	121	Southeast Asia 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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	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	104	Physical Education: Pistol and Rifle	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	108	Physical Education: Snooker	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	120	Physical Education: Aikido	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)

Major Courses **124 credits**

Core Science Courses **32 credits**

ICMA	102	Principles of Mathematics	4 (4-0-8)
ICPY	132	Principles of Physics	4 (4-0-8)
ICCH	210	General Chemistry I	4 (4-0-8)
ICCH	211	General Chemistry II	4 (4-0-8)
ICSC	302	Scientific Research and Presentations	4 (4-0-8)
ICSC	303	Statistics	4 (4-0-8)
ICSC	304	Computer for Research	4 (3-2-7)
ICSC	333	Statistics for Research	4 (4-0-8)

Required Major Courses **58 credits**

ICBI	102	Integrated Laboratory in Biological Science I	2 (0-4-2)
ICBI	202	Integrated Laboratory in Biological Science II	2 (0-4-2)
ICBI	211	General Microbiology	4 (3-2-7)
ICBI	212	General Biochemistry	4 (3-2-7)
ICBI	213	Genetics	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	308	Molecular Biology	4 (4-0-8)
ICBI	344	Environmental Science	4 (4-0-8)
ICBI	491	Seminar in Biological Science	2 (2-0-4)
ICBI	498	Research Project in Biological Science	6 (0-12-6)
ICCH	221	Organic Chemistry I	4 (4-0-8)

ICCH	224	Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
ICPY	210	General Physics	4 (3-2-7)
ICMA	215	Calculus	4 (4-0-8)

Elective Major Courses**34 credits****A. BIOLOGY CONCENTRATION**

ICBI	241	Ecology and Conservation	4 (3-2-7)
ICBI	255	Introduction to Oceanography	4 (3-2-7)
ICBI	256	Sustainable Development	4 (4-0-8)
ICBI	257	Environmental Issues: Past, Present and Future	4 (4-0-8)
ICBI	314	Tropical Ecology	4 (3-2-7)
ICBI	317	Aquatic Ecology	4 (4-0-8)
ICBI	318	Aquatic Ecology Field Course	4 (0-8-4)
ICBI	319	Conservation Biology	4 (4-0-8)
ICBI	320	Population and Community Ecology	4 (3-2-7)
ICBI	321	Invertebrate Zoology	4 (3-2-7)
ICBI	322	Vertebrate Zoology	4 (3-2-7)
ICBI	421	Entomology	4 (3-2-7)
ICBI	441	Marine Biology	4 (3-2-7)

B. BIOMEDICAL SCIENCE CONCENTRATION

ICBI	204	Developmental Biology	4 (4-0-8)
ICBI	206	Medical Ethics	2 (2-0-4)
ICBI	301	Functional Histology	4 (3-2-7)
ICBI	304	Basic Immunology	2 (2-0-4)
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	310	Mammalian Physiology	4 (3-2-7)
ICBI	311	Pharmacology and Toxicology	4 (3-2-7)
ICBI	332	Medical Microbiology	4 (4-0-8)
ICBI	341	Neurobiology	4 (3-2-7)
ICBI	391	Health Psychology	4 (4-0-8)
ICBI	402	Epidemiology	4 (3-2-7)
ICBI	403	Introduction to Tropical Medicine	4 (4-0-8)
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)
ICBI	412	Parasitology	4 (3-2-7)

C. BIOTECHNOLOGY CONCENTRATION

ICBI	315	Microbial Physiology and Genetics	4 (4-0-8)
ICBI	316	Environmental Microbiology	4 (3-2-7)
ICBI	330	Biology of Fungi	4 (4-0-8)
ICBI	372	Utilization of Water and Wastewater Treatment	4 (3-2-7)
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	464	Cell Technology	4 (3-2-7)
ICCH	311	Analytical Chemistry	4 (3-2-7)
ICCH	316	Modern Methods of Analysis	4 (3-2-7)

Free Elective Courses**8 credits**

Biological Science students can take any course offered by MUIC as a free elective, except for fundamental science courses (Fundamental Biology, Fundamental Chemistry, Fundamental Physics and Fundamental Mathematics).

CHEMISTRY MAJOR

| DEGREES OFFERED |

Bachelor of Science (Chemistry)

B.Sc. (Chemistry)

| THE FIELD |

Chemistry plays an important part in the shaping of our everyday life. The applications of its concepts are the genesis of many modern-day objects and useful materials. It is chemistry that forms the foundations of other scientific disciplines, such as pharmaceuticals, petroleum, petrochemical, biological sciences, polymer sciences and even automotive-catalysts. Modern-day chemistry has developed to such an extent that modern physics, particularly quantum mechanics, has become so interwoven and indispensable towards the understanding of chemical reactions and molecular structural characterizations. In modern-day chemical research, the notion of interdisciplinary disciplines, such as the crossovers into the realm of biological and physical problems which include nano phenomenon, is now the norm.

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 will be taught with full rigor the essential but key subjects such as General Chemistry, Organic Chemistry, Inorganic Chemistry, Analytical Chemistry and Physical Chemistry. One trimester is allotted for mandatory Quantum Mechanics. Reflecting the modern trends of chemistry, the students, by means of selecting appropriate elective courses, can orient their preference towards physical chemistry-oriented elective courses, or biological chemistry or even towards industrial chemistry selections. The elective courses in the Chemistry Program offer the Chemistry students the opportunity to shape their elective-course selection towards an emphasis on physical chemistry, organic chemistry, biological chemistry, analytical chemistry or industrial/applied chemistry.

| CAREER OPPORTUNITIES |

Career opportunities include lucrative positions with pharmaceutical companies, research positions in all fields of sciences and industry and graduate studies. There are many opportunities for chemists in governmental positions at the local, state and national levels. In addition, chemists are engaged in a large number of related fields that include medicine, dentistry, law, international secondary school education, administration, technical sales, scientific journalism and the illustrative arts.

| CURRICULUM STRUCTURE |

| Chemistry Major |

Courses	Credits
General Education Courses	60
Core Science Courses	28
Required Major Courses	62
Elective Major Courses	30
Free Elective Courses	8
TOTAL	188

| COURSE LIST |

General Education Courses	60 credits
English Communication	16 credits
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)
ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)
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 243 Belief Systems in English Usage	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	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 course 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 required to successfully complete ICCM100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences			16 credits
ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	102	Principles of Mathematics	4 (4-0-8)
ICNS	112	Integrated Biology	4 (4-0-8)
ICNS	132	Principles of Physics	4 (4-0-8)
ICNS	141	Computer Essentials	4 (3-2-7)
ICNS	142	Introduction to Internet Technology	4 (3-2-7)
ICNS	152	Southeast Asian Ecology	4 (4-0-8)
ICNS	153	Ecosystems and Natural Resources	4 (4-0-8)
ICNS	154	Science, Technology and Environment	4 (4-0-8)
ICNS	161	General Geology	4 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
ICNS	252	Marine Biology	4 (3-2-7)
ICNS	253	Environmental Science	4 (4-0-8)
ICNS	254	Pollution Biology	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			12 credits
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	106	Moral and Ethical Studies*	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM	140	Elements of Art Theory*	4 (4-0-8)
ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Intermediate Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)
ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)

ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking equential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

Social Sciences			12 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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)
ICPE	122	Selected Topics in Sports	1 (0-3-1)
ICPE	123	Cycling	1 (0-3-1)

Major Courses		120 credits
Core Science Courses		28 credits
ICCH 210	General Chemistry I	4 (4-0-8)
ICCH 221	Organic Chemistry I	4 (4-0-8)
ICMA 211	General Mathematics I	4 (4-0-8)
ICPY 211	General Physics I	4 (4-0-8)
ICSC 302	Scientific Research and Presentations	4 (4-0-8)
ICSC 303	Statistics	4 (4-0-8)
ICSC 304	Computer for Research	4 (3-2-7)
Required Major Courses		62 credits
ICCH 211	General Chemistry II	4 (4-0-8)
ICCH 222	Organic Chemistry II	4 (4-0-8)
ICCH 224	Integrated Laboratory Techniques in Chemistry I	2 (0-4-2)
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 322	Advanced Organic Chemistry	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 334	Physical Chemistry II	4 (4-0-8)
ICCH 381	Mathematics for Chemists	4 (4-0-8)
ICCH 390	Organic Chemistry Laboratory Techniques	2 (0-4-2)
ICCH 441	Inorganic Chemistry I	4 (4-0-8)
ICCH 442	Inorganic Chemistry II	4 (4-0-8)
ICCH 454	Seminar in Chemistry	2 (2-0-4)
ICCH 455	Senior Project in Chemistry	6 (0-12-6)
ICBI 212	General Biochemistry	4 (3-2-7)
Elective Major Courses		30 credits
ICCH 335	Physical Chemistry III	4 (4-0-8)
ICCH 421	Physical Organic Chemistry	4 (4-0-8)
ICCH 422	Organic Synthesis	4 (4-0-8)
ICCH 423	Heterocyclic Chemistry	4 (4-0-8)
ICCH 424	Natural Product Chemistry	4 (4-0-8)
ICCH 431	Advanced Physical Chemistry	4 (4-0-8)
ICCH 432	Special Topics in Physical Chemistry	2 (2-0-4)
ICCH 443	Special Topics in Inorganic Chemistry	2 (2-0-4)
ICCH 444	Environmental Chemistry	4 (3-2-7)
ICCH 451	Industrial Chemistry	4 (3-2-7)
ICCH 452	Polymer Science and Technology	4 (4-0-8)
ICCH 453	Special Topics in Industrial Chemistry	2 (2-0-4)

ICCH	456	Nuclear and Radiochemistry	4 (3-2-7)
ICCH	457	Industrial Chemical Processes	4 (3-2-7)
ICCH	461	Pharmacological Chemistry	4 (4-0-8)
ICCH	462	Macromolecules	4 (4-0-8)
ICCH	471	Bioorganic Chemistry	4 (4-0-8)
ICCH	472	Secondary Metabolism	4 (4-0-8)
ICBI	311	Pharmacology and Toxicology	4 (3-2-7)
ICFS	312	Food Chemistry I	4 (3-2-7)
ICFS	313	Food Chemistry II	4 (3-2-7)

Free Elective Courses**8 credits**

Note: Chemistry students can take any course offered by MUIC as a free elective, except for ICNS 101, ICNS 103, ICNS 105, ICNS 111, ICNS 121, and ICNS 131.

COMPUTER ENGINEERING MAJOR

| 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 |

| *Computer Engineering Major* |

Courses	Credits
General Education Courses	48
Core Courses	33
Required Major Courses	79
Elective Major Courses	16
Free Elective Courses	8
TOTAL	184

| COURSE LIST |**General Education Courses** **48 credits****English Communication** **12 credits**

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)
ICCM	111	Advanced English Communication I	4 (4-0-8)
ICCM	112	Advanced English Communication II	4 (4-0-8)
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	243	Belief Systems in English Usage	4 (4-0-8)
ICEG	250	Introduction to Linguistics	4 (4-0-8)
ICEG	265	Literature into Film	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 course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences **12 credits**

ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	102	Principles of Mathematics	4 (4-0-8)
ICNS	112	Principles of Biology	4 (4-0-8)
ICNS	152	Southeast Asian Ecology	4 (4-0-8)
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 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)

ICNS	211	The Science of Food	4 (4-0-8)
ICNS	252	Marine Biology	4 (3-2-7)
ICNS	253	Environmental Science	4 (4-0-8)
ICNS	254	Pollution Biology	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**12 credits**

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	106	Moral and Ethical Studies*	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM	140	Elements of Art Theory*	4 (4-0-8)
ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Digital Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)
ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)

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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	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	104	Physical Education: Pistol and Rifle	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	108	Physical Education: Snooker	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	120	Physical Education: Aikido	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)

Major Courses **128 credits**

Core Courses			33 credits
EGCI	100	Introduction to Computer Engineering	1 (0-2-1)
EGCI	200	Engineering Mathematics	4 (4-0-8)
EGCI	203	Ordinary Differential Equations	4 (4-0-8)
EGCI	204	Engineering Mechanics	4 (4-0-8)
ICMA	215	Calculus	4 (4-0-8)
ICNS	122	Principles of Chemistry	4 (4-0-8)
ICNS	132	Principles of Physics	4 (4-0-8)

ICPY	211	General Physics I	4 (4-0-8)
ICSC	333	Statistics for Research	4 (4-0-8)

Required Major Courses **79 credits**

EGCI	111	Computer Programming	4 (3-2-7)
EGCI	201	Discrete Mathematics	4 (4-0-8)
EGCI	202	Numerical Methods for Signal Processing	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	230	Electric Circuit Analysis	4 (4-0-8)
EGCI	231	Digital Circuit Design	4 (3-2-7)
EGCI	232	Engineering Electronics	4 (3-2-7)
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	321	Database Systems	4 (4-0-8)
EGCI	330	Microprocessors and Interfacing	4 (4-0-8)
EGCI	331	Introduction to IC Design	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	390	Engineering Training	1 (0-100-50)
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)

Elective Major Courses **16 credits**

EGCI	301	Computer Graphics	4 (4-0-8)
EGCI	304	Computer Aided Analysis and Design	4 (4-0-8)
EGCI	334	Computation Structures	4 (4-0-8)
EGCI	380-389	Special Topics in Computer Engineering (...)	4 (4-0-8)
EGCI	391-399	Special Topics in Computer Engineering (...)	4 (4-0-8)
EGCI	401	Operations Research	4 (4-0-8)
EGCI	402	Switching Theory	4 (4-0-8)
EGCI	403	Engineering Management	4 (4-0-8)
EGCI	404	Theory of Computation	4 (4-0-8)
EGCI	405	Mechatronics	4 (4-0-8)
EGCI	411	Object Oriented Design	4 (4-0-8)

EGCI 412	Introduction to Parallel Programming	4 (4-0-8)
EGCI 421	Management Information Systems	4 (4-0-8)
EGCI 422	Electronic Commerce	4 (4-0-8)
EGCI 423	Web Database and Information Systems	4 (4-0-8)
EGCI 424	Advanced Topics in Database Systems	4 (4-0-8)
EGCI 425	Data Mining	4 (4-0-8)
EGCI 426	Knowledge Management	4 (4-0-8)
EGCI 432	Distributed Systems	4 (4-0-8)
EGCI 433	Introduction to VLSI Design	4 (4-0-8)
EGCI 442	Advanced Topics in Software Engineering	4 (4-0-8)
EGCI 451	Compilers	4 (4-0-8)
EGCI 452	Advanced Topics in Operating Systems	4 (4-0-8)
EGCI 461	Artificial Intelligence	4 (4-0-8)
EGCI 462	Expert Systems	4 (4-0-8)
EGCI 463	Pattern Recognition	4 (4-0-8)
EGCI 464	Voice Recognition	4 (4-0-8)
EGCI 465	Fuzzy Sets and Neural Networks	4 (4-0-8)
EGCI 466	Natural Language Processing	4 (4-0-8)
EGCI 472	Introduction to Cryptography	4 (4-0-8)
EGCI 473	Computer Security	4 (4-0-8)
EGCI 474	Internetworking Technologies I	4 (3-2-7)
EGCI 475	Internetworking Technologies II	4 (3-2-7)
EGCI 481	Digital Signal Processing	4 (4-0-8)
EGCI 486	Image Processing	4 (4-0-8)

Free Elective Courses**8 credits**

Computer Engineering students can take any courses offered by MUIC as a free elective, except ICNS 101, ICNS 103, ICNS 105, ICNS 111, ICNS 121, ICNS 131, ICNS 141 and ICNS 142.

| STUDY TRACK |

A guideline to choose your elective courses according to your interest in a specific computer engineering field.

• Circuit and Hardware

EGCI 334	Computation Structures	4 (4-0-8)
EGCI 402	Switching Theory	4 (4-0-8)
EGCI 405	Mechatronics	4 (4-0-8)
EGCI 433	Introduction to VLSI Design	4 (4-0-8)

• **Industrial Applications**

EGCI	301	Computer Graphics	4 (4-0-8)
EGCI	304	Computer Aided Analysis and Design	4 (4-0-8)
EGCI	463	Pattern Recognition	4 (4-0-8)
EGCI	464	Voice Recognition	4 (4-0-8)
EGCI	465	Fuzzy Sets and Neural Networks	4 (4-0-8)
EGCI	486	Image Processing	4 (4-0-8)

• **Computer Systems**

EGCI	432	Distributed Systems	4 (4-0-8)
EGCI	451	Compilers	4 (4-0-8)
EGCI	452	Advanced Topics in Operating Systems	4 (4-0-8)

• **Communication, Network and Security**

EGCI	472	Introduction to Cryptography	4 (4-0-8)
EGCI	473	Computer Security	4 (4-0-8)
EGCI	474	Internetworking Technologies I	4 (3-2-7)
EGCI	475	Internetworking Technologies II	4 (3-2-7)

• **Artificial Intelligence and Applications**

EGCI	461	Artificial Intelligence	4 (4-0-8)
EGCI	462	Expert Systems	4 (4-0-8)
EGCI	466	Natural Language Processing	4 (4-0-8)

• **Database and Information System Design**

EGCI	421	Management Information Systems	4 (4-0-8)
EGCI	422	Electronic Commerce	4 (4-0-8)
EGCI	423	Web Database and Information Systems	4 (4-0-8)
EGCI	424	Advanced Topics in Database Systems	4 (4-0-8)
EGCI	425	Data Mining	4 (4-0-8)
EGCI	426	Knowledge Management	4 (4-0-8)
EGCI	442	Advanced Topics in Software Engineering	4 (4-0-8)

• **Other Computer Engineering Electives**

EGCI	401	Operations Research	4 (4-0-8)
EGCI	403	Engineering Management	4 (4-0-8)
EGCI	404	Theory of Computation	4 (4-0-8)
EGCI	411	Object Oriented Design	4 (4-0-8)
EGCI	412	Introduction to Parallel Programming	4 (4-0-8)
EGCI	481	Digital Signal Processing	4 (4-0-8)

COMPUTER SCIENCE MAJOR

| DEGREE OFFERED |

Bachelor of Science (Computer Science)

B.Sc. (Computer Science)

| THE FIELD |

Computer Science is one of promising disciplines for career opportunities. It emphasizes a wide range of computing fields from theoretical foundations to the state-of-the-art technology development in large-scale development systems and networks, intelligent systems, mobile and Internet programming and more. Students majoring in Computer Science will receive solid grounding in such areas as programming, algorithm analysis and design, systems development, information management, and computer security.

The Computer Science Program at MUIC offers students the opportunity to become involved in many areas of interest in terms of theory, software, and hardware. This includes microprocessors and computer architecture, computer graphics, database systems, distributed systems, computer networks, numerical analysis, operating systems, programming languages, software engineering, artificial intelligence including data warehousing and mining, and information technology management.

| CAREER OPPORTUNITIES |

The Computer Science major is designed to prepare students for the following career paths:

- **System development:** Jobs in this category includes web development, interface design, security issues, mobile computing. Career opportunities occur in a wide variety of settings including large or small software companies, large or small computer services companies and large organizations of all kinds (industry, government, banking, healthcare, etc.).
- **Innovation of computer technology application:** Career opportunities in this area can involve a position at a research university or industrial research and development laboratory, entrepreneurial activity, or a combination of the two.
- **Computing solution development:** This involves applying and developing computer science theory algorithms for the best possible solutions for computationally intensive problems. Career opportunities typically require graduate work to a Ph.D. level, followed by a position at a research university or an industrial research and development laboratory.
- **Organizational technology infrastructure planning and management:** This is also the type of work aimed at those who study information technology (IT).

| CURRICULUM STRUCTURE |

| Computer Science Major |

Courses	Credits
General Education Courses	60
Core Science Courses	32
Required Major Courses	54
Elective Major Courses	32
Free Elective Courses	8
TOTAL	186

| COURSE LIST |

General Education Courses	60 credits
English Communication	16 credits
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)
ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)
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 243 Belief Systems in English Usage	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	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 course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences			16 credits
ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	102	Principles of Mathematics	4 (4-0-8)
ICNS	112	Principles of Biology	4 (4-0-8)
ICNS	122	Principles of Chemistry	4 (4-0-8)
ICNS	132	Principles of Physics	4 (4-0-8)
ICNS	151	Basic Ecology	4 (3-2-7)
ICNS	152	Southeast and Natural Resources	4(4-0-8)
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 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
ICNS	252	Marine Biology	4 (3-2-7)
ICNS	253	Environmental Science	4 (4-0-8)
ICNS	254	Pollution Biology	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 : Mandatory Natural Sciences course : ICNS 102 and ICNS 132

Humanities			12 credits
ICHM	101	Introduction to Philosophy *	4 (4-0-8)
ICHM	102	Man and Nature in World Literature	4 (4-0-8)
ICHM	103	Introduction to Logic *	4 (4-0-8)
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	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	206	Ethics and Technology	4 (4-0-8)
ICHM	216	Tragedy and Comedy in Literature	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	219	20th Century Philosophy	4 (4-0-8)
ICHM	220	The European Enlightenment*	4 (4-0-8)
ICHM	221	Critical Thinking*	4 (4-0-8)
ICHM	222	Advanced Music Appreciation	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)

ICHM	224	Introduction to Thai Music	4 (2-2-5)
ICHM	225	The Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses : ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

Social Sciences			12 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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	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	104	Physical Education: Pistol and Rifle	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	108	Physical Education: Snooker	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	120	Physical Education: Aikido	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)

Major Courses**118 credits****Core Science Courses****32 credits**

ICMA	211	General Mathematics I	4 (4-0-8)
ICMA	212	General Mathematics II	4 (4-0-8)

ICPY	211	General Physics I	4 (4-0-8)
ICSC	302	Scientific Research and Presentations	4 (4-0-8)
ICSC	303	Statistics	4 (4-0-8)
ICCS	199	Computer Concepts and Fundamentals	4 (4-0-8)
ICCS	201	Computer Programming I	4 (3-2-7)
ICCS	204	Introduction to Digital Electronics	4 (4-0-8)

Required Major Courses **54 credits**

ICCS	203	Computer Programming II	4 (3-2-7)
ICCS	207	Introduction to File Processing	4 (4-0-8)
ICCS	208	Computer Logic	4 (4-0-8)
ICCS	306	Numerical Methods I	4 (4-0-8)
ICCS	315	Operating Systems	4 (4-0-8)
ICCS	316	Computer Architectures	4 (4-0-8)
ICCS	321	Data Structures and Algorithm Analysis	4 (4-0-8)
ICCS	323	Computer Data Communication	4 (4-0-8)
ICCS	324	Discrete Structures	4 (4-0-8)
ICCS	325	Theory of Computation	4 (4-0-8)
ICCS	365	Information System Analysis and Design	4 (4-0-8)
ICCS	371	Internship in Computer Science	2 (2-0-4)
ICCS	411	Database Management Systems	4 (4-0-8)
ICCS	499	Senior Project in Computer Science	4 (0-8-4)

Elective Major Courses **32 credits**

ICMA	321	Linear Algebra	4 (4-0-8)
ICCS	281	Advanced Mathematics for Computer Science	4 (4-0-8)
ICCS	311	Compilers	4 (4-0-8)
ICCS	312	Human Computer Interaction	4 (4-0-8)
ICCS	322	Microcomputer Systems and Interfacing	4 (3-2-7)
ICCS	331	Organization of Programming Languages	4 (4-0-8)
ICCS	332	Image Processing and Visualization	4 (4-0-8)
ICCS	366	Management Information System	4 (4-0-8)
ICCS	367	Design Patterns	4 (4-0-8)
ICCS	398	Special Topics in Computer Science I	4 (4-0-8)
ICCS	406	Numerical Methods II	4 (4-0-8)
ICCS	412	Distributed Database Systems	4 (3-2-7)
ICCS	413	Data Warehousing and Data Mining	4 (4-0-8)
ICCS	414	Information Storage and Retrieval	4 (4-0-8)
ICCS	415	Computer Graphics	4 (3-2-7)
ICCS	416	Knowledge Management	4 (4-0-8)
ICCS	421	Computer Networks and Distributed Processing	4 (3-2-7)

ICCS	425	Algorithms	4 (4-0-8)
ICCS	426	Advanced Data Communications	4 (3-2-7)
ICCS	427	Enterprise Networking	4 (4-0-8)
ICCS	428	Object - oriented Concepts	4 (4-0-8)
ICCS	429	Microprocessor Concepts and Applications	4 (3-2-7)
ICCS	431	Software Design and Development	4 (4-0-8)
ICCS	432	Software Engineering Project Management	4 (4-0-8)
ICCS	433	Network Analysis	4 (3-2-7)
ICCS	434	Computer Security	4 (4-0-8)
ICCS	435	Database System Development and Analysis	4 (4-0-8)
ICCS	436	Operating Systems Analysis	4 (4-0-8)
ICCS	441	Business Application Programming	4 (3-2-7)
ICCS	442	Decision Support System	4 (4-0-8)
ICCS	451	Artificial Intelligence	4 (4-0-8)
ICCS	452	Intelligent Robotics	4 (4-0-8)
ICCS	453	Machine Learning	4 (4-0-8)
ICCS	473	Technology of Computer Center Management	4 (4-0-8)
ICCS	474	Internet Programming	4 (3-2-7)
ICCS	476	Internet Enterprise Design and Development	4 (3-2-7)
ICCS	477	System Simulation	4 (4-0-8)
ICCS	478	Pattern Recognition	4 (4-0-8)
ICCS	479	Electronic Commerce	4 (4-0-8)
ICCS	497	Seminar in Computer Science	2 (2-0-4)
ICCS	498	Special Topics in Computer Science II	4 (4-0-8)

Free Elective Courses**8 credits**

Note: Students can take any MUIC courses as a free elective, except for ICGM 206, ICNS 103, ICNS 111, ICNS 121, ICNS 131, ICNS 141 and ICNS 142. Any other courses which students choose as free electives must be approved by the students' academic advisors.

ENVIRONMENTAL SCIENCE MAJOR

| DEGREE OFFERED |

1. Bachelor of Science (Environmental Science: Ecology)
 2. Bachelor of Science (Environmental Science: Environmental Technology)
- 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. There are two concentrations: Environmental Technology and Ecology. 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 sensitive habitat protection, ecosystem restoration, global warming, waste management, ground and surface water contamination, pesticide toxicity, resistance, and degradation, and the effect of environmental stress on terrestrial and aquatic ecosystems.

| CAREER OPPORTUNITIES |

The B.Sc. degree in Environmental Science leads to a variety of career opportunities in private industry and governmental agencies concerned with environmental quality assessment, community environment program, and inter-agency coordination in environmental quality maintenance. Graduates can work as scholars, researchers, experts on the national and international levels, as well as in the public sector in the supervision of the environment and its resources in addition to private and business sectors in the production of goods and services, which require secured technology to the environment, monitoring environment and reducing pollution in the environmental organization for competition and sustenance.

Graduates are well prepared for their further studies in postgraduate levels in environmental management and resources, environmental biology, applied biology, conservation biology, environmental toxicology and environmental technology.

| CURRICULUM STRUCTURE |

| Environmental Science Major |

Courses	Credits
General Education Courses	52
Core Science Courses	32
Required Major Courses	66
Elective Major Courses	28
Free Elective Courses	8
TOTAL	186

| COURSE LIST |

General Education Courses	52 credits
English Communication	16 credits
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)
ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)
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 243 Belief Systems in English Usage	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	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 course 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 required to successfully complete ICCM100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences			12 credits
ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	141	Computer Essentials	4 (3-2-7)
ICNS	142	Internet Technology	4 (3-2-7)
ICNS	152	Southeast Asian Ecology	4 (4-0-8)
ICNS	154	Science, Technology, and Environment	4 (4-0-8)
ICNS	161	General Geology	4 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
 Humanities			12 credits
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	106	Moral and Ethical Studies*	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM	140	Elements of Art Theory*	4 (4-0-8)
ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Digital Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)
ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	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	104	Physical Education: Pistol and Rifle	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	108	Physical Education: Snooker	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	120	Physical Education: Aikido	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)

Major Courses**126 credits****Core Science Courses****32 credits**

ICNS	112	Integrated Biology	4 (4-0-8)
ICNS	153	Ecosystems and Natural Resources	4 (3-2-7)
ICMA	102	Principles of Mathematics	4 (4-0-8)
ICPY	132	Principles of Physics	4 (4-0-8)

ICCH	210	General Chemistry I	4 (4-0-8)
ICSC	302	Scientific Research and Presentations	4 (4-0-8)
ICSC	303	Statistics	4 (4-0-8)
ICSC	304	Computer for Research	4 (3-2-7)

Required Major Courses **66 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	331	Soil, Land Use and Degradation	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	491	Seminar in Environmental Science	2 (2-0-4)
ICEN	492	Environmental Field Excursions	2 (0-4-2)
ICEN	496	Senior Project in Environmental Sciences	6 (0-12-6)
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)
ICMA	215	Calculus	4 (4-0-8)

Elective Major Courses **28 credits**

A. ECOLOGY AREA OF CONCENTRATION

ICBI	102	Integrated Laboratory in Biological Sciences I	2 (0-4-2)
ICBI	212	General Biochemistry	4 (3-2-7)
ICBI	231	Plant Biology	4 (3-2-7)
ICBI	241	Ecology and Conservation	4 (3-2-7)
ICBI	310	Mammalian Physiology	4 (3-2-7)
ICBI	321	Invertebrate Zoology	4 (3-2-7)
ICBI	322	Vertebrate Zoology	4 (3-2-7)
ICBI	421	Entomology	4 (3-2-7)
ICBI	441	Marine Biology	4 (3-2-7)
ICEN	314	Tropical Ecology	4 (3-2-7)
ICEN	317	Aquatic Ecology	4 (3-2-7)
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	415	Biodiversity	4 (4-0-8)
ICEN	416	Ecotoxicology	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	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	469	Heritage Conservation	4 (2-4-6)
ICEN	483	Physical Planning and Environment	4 (4-0-8)

B. ENVIRONMENTAL TECHNOLOGY AREA OF CONCENTRATION

ICCH	311	Analytical Chemistry I	4 (3-2-7)
ICEN	301	Basic Environmental Statistics	4 (4-0-8)
ICEN	313	Clean Technology and Waste Utilization	4 (4-0-8)
ICEN	352	Environmental and Resource Economics	4 (4-0-8)
ICEN	401	Applied Mathematics for Environmental Studies	4 (4-0-8)
ICEN	402	Geoinformatics	4 (3-2-7)
ICEN	403	Principle of Environmental Informatics	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	421	Water and Wastewater Treatment	4 (4-0-8)
ICEN	422	Solid and Hazardous Waste Management	4 (4-0-8)
ICEN	441	Occupational Health and Safety	4 (4-0-8)
ICEN	464	Water Resource Management	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)

Free Elective Courses

8 credits

Note: Students can choose any courses offered by MUIC or other faculties, with the approval of advisors, as a free elective, except for ICNS 103, ICNS 111, ICNS, 121 and ICNS 131.

FOOD SCIENCE AND TECHNOLOGY MAJOR

| DEGREE OFFERED |

Bachelor of Science (Food Science and Technology)

B.Sc. (Food Science and Technology)

| 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 the 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 |

In Thailand, the food manufacturing industry caters to both local market and export-oriented opportunities. Our international clients include neighbouring ASEAN countries as well as the larger export markets of Europe, North America, and Japan. Thus there is often a need for highly trained technical personnel who are able to communicate well in English because in these countries most people concerned with food imports use English as a second language. In the Food Science and Technology Program at MUIC, students receive rigorous theoretical and practical training in the basic sciences and also in applied food technology, similar to what is found in most food technology programs.

The difference at MUIC is that all lectures, written materials, special lectures and trips are completely in English. Internationally graduate studies programs either in Thailand or abroad typically require a strong command of English, as demonstrated in standard English exams such as TOEFL or the IELTS exams. This gives the MUIC Food Science and Technology graduates a huge competitive advantage upon completion of their degrees. Because of their broad scientific and technical background, graduates are well prepared to work in the food manufacturing industry or to continue their studies toward a master's or doctorate degree in either Food Science or other related subjects.

| CURRICULUM STRUCTURE |

| Food Science and Technology Major |

Courses	Credits
General Education Courses	59
Core Science Courses	28
Required Major Courses	70
Required Major Business Courses	12
Elective Major Courses	10
Free Elective Courses	8
TOTAL	187

| COURSE LIST |

General Education Courses	59 credits
English Communication	16 credits
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)
ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)
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 243 Belief Systems in English Usage	4 (4-0-8)
ICEG 250 Introduction to Linguistics	4 (4-0-8)
ICEG 265 Literature into Film	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 course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences			16 credits
ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	102	Principles of Mathematics	4 (4-0-8)
ICNS	112	Principles of Biology	4 (4-0-8)
ICNS	122	Principles of Chemistry	4 (4-0-8)
ICNS	132	Principles of Physics	4 (4-0-8)
ICNS	141	Computer Essentials	4 (3-2-7)
ICNS	142	Internet Technology	4 (3-2-7)
ICNS	151	Basic 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 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
ICNS	252	Marine Biology	4 (3-2-7)
ICNS	253	Environmental Science	4 (4-0-8)
ICNS	254	Pollution Biology	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 : Mandatory Natural Sciences course : ICNS 211

Humanities			12 credits
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	106	Moral and Ethical Studies*	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM	140	Elements of Art Theory*	4 (4-0-8)
ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Digital Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)

ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

Social Sciences **12 credits**

ICSS	112	Introduction to Psychology	4 (4-0-8)
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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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	4 (4-0-8)

Health Science and Physical Education**3 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	104	Physical Education: Pistol and Rifle	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	108	Physical Education: Snooker	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)

ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	120	Physical Education: Aikido	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)

Major Courses **120 credits**

Core Science Courses **28 credits**

ICCH	111	General Chemistry	4 (3-2-7)
ICCH	211	General Chemistry II	4 (4-0-8)
ICCH	220	Basic Organic Chemistry	4 (3-2-7)
ICMA	215	Calculus	4 (4-0-8)
ICPY	210	General Physics	4 (3-2-7)
ICSC	302	Scientific Research and Presentations	4 (4-0-8)
ICSC	303	Statistics	4 (4-0-8)

Required Major Courses **70 credits**

ICBI	211	General Microbiology	4 (3-2-7)
ICBI	212	General Biochemistry	4 (3-2-7)
ICCH	311	Analytical Chemistry I	4 (3-2-7)
ICFS	312	Food Chemistry I	4 (3-2-7)
ICFS	313	Food Chemistry II	4 (3-2-7)
ICFS	314	Food Analysis	4 (3-2-7)
ICFS	315	Food Processing I	4 (3-2-7)
ICFS	316	Food Processing II	4 (3-2-7)
ICFS	321	Principles of Quality Assurance in Food Processing	4 (4-0-8)
ICFS	331	Food Hygiene and Sanitation	4 (4-0-8)
ICFS	372	Utilization of Water and Wastewater Treatment	2 (2-0-4)
ICFS	421	Food and Nutrition	4 (4-0-8)
ICFS	431	Food Microbiology	4 (3-2-7)
ICFS	441	Food Engineering I	4 (3-2-7)
ICFS	442	Food Engineering II	4 (3-2-7)
ICFS	491	Seminar in Food Science and Technology	2 (2-0-4)
ICFS	492	Senior Project in Food Science and Technology	6 (0-12-6)
ICFS	493	Internship	4 (0-12-4)

Required Major Business Courses			12 credits
ICFS	332	Food Law and Standard of Commercial Food Products *	4 (4-0-8)
ICMB	341	Business Law *	4 (4-0-8)
ICFS	381	Products Management and Marketing of Food Products **	4 (4-0-8)
ICMB	221	Principles of Marketing **	4 (4-0-8)
ICMB	211	Fundamental Financial Accounting ***	4 (4-0-8)

* Either ICFS 332 or ICMB 341

** Either ICFS 381 or ICMB 221

*** Either ICMB 211 or any BBA course for which there is no prerequisite.

Elective Major Courses			10 credits
ICFS	322	Fruits and Vegetables Technology	4 (4-0-8)
ICFS	323	Marine and Freshwater Products Technology	4 (4-0-8)
ICFS	324	Meat and Poultry Products Technology	4 (4-0-8)
ICFS	325	Dairy Products Technology	4 (4-0-8)
ICFS	371	Food Product Development	4 (4-0-8)
ICFS	423	Beverage Technology	4 (4-0-8)
ICFS	424	Fat and Oil Technology	4 (4-0-8)
ICFS	425	Cereal Science and Technology	4 (3-2-7)
ICFS	432	Sensory Evaluation of Food Products	4 (4-0-8)
ICFS	452	Food Packaging	4 (4-0-8)
ICFS	463	Field Trip	2 (0-6-2)

Free Elective Courses	8 credits
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Note: Students can take any MUIC courses as a free elective, except for ICNS 101, ICNS 103, ICNS 105, ICNS 111, ICNS 121, and ICNS 131.

Other courses offered in Mahidol University may be taken as Free Elective Courses with the approval of the Food Science and Technology Program Director.

PHYSICS MAJOR

| DEGREE OFFERED |

Bachelor of Science (Physics)

B.Sc. (Physics)

| THE FIELD |

Physics is one of the major basic sciences. The study in physics 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 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 |

Excellent career opportunities for Physics and Applied Physics graduates exist. Graduates in physics can work as researchers or laboratory assistants in industrial R&D and government agencies, including the departments of science and technology. Graduates are able to work in hospitals, medical schools or graduate programs in all fields of medical physics and physical science. For many Physics majors, undergraduates studies are only a preliminary to the pursuit of an advanced degree that will lead to a career as an academic, scientist or researcher.

| CURRICULUM STRUCTURE |

| Physics Major |

Courses	Credits
General Education Courses	52
Core Science Courses	32
Required Major Courses	76
Elective Major Courses	20
Free Elective Courses	8
TOTAL	188

| COURSE LIST |

General Education Courses	52 credits
English Communication	16 credits
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)
ICCM	111	Advanced English Communication I	4 (4-0-8)
ICCM	112	Advanced English Communication II	4 (4-0-8)
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	243	Belief Systems in English Usage	4 (4-0-8)
ICEG	250	Introduction to Linguistics	4 (4-0-8)
ICEG	265	Literature into Film	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 course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences			12 credits
ICNS	015	Refresher Mathematics	0 (4-0-0)
ICNS	100	Intensive Mathematics	0 (4-0-0)
ICNS	112	Integrated Biology*	4 (4-0-8)
ICNS	141	Computer Essentials	4 (3-2-7)
ICNS	142	Internet Technology	4 (3-2-7)
ICNS	152	Southeast Asian Ecology	4 (4-0-8)
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 (4-0-8)
ICNS	162	Southeast Asian Geography	4 (4-0-8)
ICNS	171	The Scientific Approach and Society	4 (3-2-7)
ICNS	211	The Science of Food	4 (4-0-8)
ICNS	256	Sustainable Development	4 (4-0-8)
ICNS	257	Environmental Issues: Past, Present and Future	4 (4-0-8)

* Recommended

Humanities			12 credits
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	106	Moral and Ethical Studies*	4 (4-0-8)
ICHM	107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM	140	Elements of Art Theory*	4 (4-0-8)
ICHM	141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM	142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Digital Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)
ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses

: ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	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	104	Physical Education: Pistol and Rifle	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	108	Physical Education: Snooker	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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	120	Physical Education: Aikido	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)
Major Courses			128 credits
Core Science Courses			32 credits
ICPY	132	Principles of Physics	4 (4-0-8)
ICPY	211	General Physics I	4 (4-0-8)
ICPY	212	General Physics II	4 (4-0-8)
ICMA	102	Principles of Mathematics	4 (4-0-8)
ICMA	218	Calculus for Physical Science	4 (4-0-8)
ICSC	302	Scientific Research and Presentations	4 (4-0-8)
ICSC	303	Statistics	4 (4-0-8)
ICSC	304	Computer for Research	4 (3-2-7)
Required Major Courses			76 credits
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	331	Mathematical Methods in Physics I	4(4-0-8)
ICPY	332	Mathematical Methods in Physics II	4(4-0-8)
ICPY	341	Integrated Laboratory In Physics I	2(0-4-2)
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	371	Thermal Physics	4(4-0-8)
ICPY	435	Seminar in Physics I	1(0-2-1)
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	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)
ICCH	210	General Chemistry I	4(4-0-8)
ICCH	211	General Chemistry II	4(4-0-8)

Elective Major Courses**20 credits**

ICPY	325	Advanced Optics	4(4-0-8)
ICPY	326	Special Topics in Optics	2(2-0-4)
ICPY	327	Laser and Applications	4(4-0-8)
ICPY	333	Mathematical Methods in Physics III	4(4-0-8)
ICPY	334	Numerical Methods in Physics	4(4-0-8)
ICPY	421	Theoretical Physics	4(4-0-8)
ICPY	431	Surface Analysis	4(4-0-8)
ICPY	453	Theory of Relativity	4(4-0-8)
ICPY	461	Quantum Mechanics II	4(4-0-8)
ICPY	462	Molecular Dynamics	4(4-0-8)
ICPY	474	Astrophysics	4(4-0-8)
ICPY	475	Plasma Physics	4(4-0-8)
ICPY	476	High Energy Physics	4(4-0-8)
ICPY	477	Special Topics in Nuclear Physics	2(2-0-4)
ICPY	478	Advanced Topics on Solid State Physics	4(4-0-8)
ICPY	481	Nanomaterial Physics	4(4-0-8)
ICPY	482	Special Topics in Nanomaterials	2(2-0-4)
ICPY	490	Computational Physics	4(4-0-8)
ICPY	491	Computer Programming for Physicists	4(4-0-8)
ICPY	492	Electronics	4(4-0-8)
ICPY	493	Geophysics	4(4-0-8)
ICPY	495	Special Topics in Geophysics	2(2-0-4)
ICPY	496	Biophysics	4(4-0-8)
ICPY	497	Special Topics in Biophysics	2(2-0-4)
ICCS	201	Computer Programming I	4 (3-2-7)
ICCS	203	Computer Programming II	4 (3-2-7)

Free Elective Courses**8 credits**

Physics students can take any course offered by MUIC as a free elective, but not fundamental science courses (Fundamental Biology, Fundamental Chemistry, Fundamental Mathematics and Fundamental Physics).



SOCIAL SCIENCE

DIVISION

| **DIVISION CHAIRMAN** |

Associate Professor Dr. Peter R. Smith, B.Ed. (Hons.) (Geography; University of Bristol, England), Ph.D. (Sociology of Religion; University of Lancaster, England)

| **FACULTY MEMBERS** || **Full-Time** |

Ms. Ruchi Agarwal, B.A. (Business Administration; Mahidol University International College, Thailand), M.A. (International Economics and Finance; Chulalongkorn University, Thailand)

Mr. Iljas Baker, B.A. (Sociology and Social Administration; University of Strathclyde, Scotland), C.A.S.S. (Applied Social Studies; University of Aberdeen, Scotland), M. Phil. (Urban Design and Regional Planning; University of Edinburgh, Scotland)

Dr. Matthew Copeland, B.A. (Chinese Studies; University of Boulder, USA), M.A. (History and Chinese Studies; University of Colorado, USA), Ph.D. (Asian Studies; Australian National University, Australia)

Assistant Professor Dr. Marja-Leena Heikilä-Horn, M.A. (History; Abo Akademi University, Finland), Ph.D. (Comparative Religions; University of Abo, Finland)

Assistant Professor Dr. Eugene Jones, B.A. (History; Lincoln University, Missouri, USA), M.A. (Philosophy; University of Missouri, Columbia, USA), Ph.D. (Social and Political Philosophy; University of Missouri, Columbia, USA)

Mr. William J. Jones, B.A. (Social Science: International Studies; Mahidol University International College, Thailand), M.A. (European Studies; Chulalongkorn University, Thailand)

Mr. Ian Mc Donald, B.A. (Psychology; Stephen F. Austin State University, Texas, USA), M.A. (Psychology; Eastern Michigan University, USA)

Mr. Christian Oesterheld, B.A. (Austronesian Studies, Asia-Africa-Institute; University of Hamburg, Germany), MSc. (Conflict, Violence and Development; School of Oriental and African Studies, University of London, England)

Ms. Natanaree Posrithong, B.A. (Hons.) (Social Science: International Studies; Mahidol University International College, Thailand), M.A. (History of International Relations; London School of Economics and Political Science, England)

Mr. Douglas Rhein, B.A. (Psychology; East Michigan University, USA) M.A. (Communications; University of Leicester, England)

Dr. Dale Rorex, B.A. (Spanish and History; University of California–Sacramento, USA), M.A. (Latin America History; National University of Mexico), M.S. (Linguistics; University of Central Connecticut, USA), Ph.D. (Chicano Studies; University of North Texas, USA)

Ms. Pattaka Sa-ngimnet, B.A. (Social Science), Mahidol University International College, Thailand., M.A. (History of Gender Issues), University of Central Arkansas, USA.

Dr. James Warren, B.A. (Hons.) Modern History and Politics, University of Reading, UK., M.A. South East Asia Area Studies (Distinction), SOAS, University of London, UK., PhD. History, SOAS, University of London, UK.

| **Part-Time** |

Mr. Rohit Agarwal, B.A. (Business English; Assumption University; Thailand), M.A. (International Tourism and Hospitality Management; Southern Cross University, NSW, Australia)

Mr. Panlavée Boonpongsa, B.A. (Social Science: International Studies; Mahidol University International College, Thailand), M.A. (International Relations; Thammasat University, Thailand)

Dr. Ramesh Boonratana, B. Sc. (Anthropology, Panjab University), M.Sc. (Anthropology, Panjab University), Ph.D. (Biology, Mahidol University, Thailand)

Associate Professor Dr. Wariya Chinwanno, Ph.D. (American Studies; University of Hawaii, USA)

Assistant Professor Dr. Charles Freeland, B.A. (Philosophy; University of Colorado at Boulder, USA), Ph.D. (Philosophy; Duquesne University, Pittsburgh, Pa, USA)

Mr. Takayoshi Fujiwara, B.A. (Linguistics; University of Tsukuba), B.A. (Mass Communications; University of Tsukuba, Japan), M.A. (Social Psychology; Histotsubashi University, Tokyo, Japan)

Dr. Mike Hayes, B.A. (Hons.) (Communications; Curtin University, Australia), M.A. (Post Colonial Studies; Wollongong, Australia), Ph.D. (Communication & Politics; Wollongong, Australia)

Mr. Jose Angel Hernaiz-Cotrina, B.A. (Hons) (European Studies; University of Coventry, England) M.A. (Marketing; Coventry, UK)

Associate Professor Dr. Thanik Lertcharnit, B.A. (Archaeology; Silpakorn University, Thailand), M.A. (Anthropology;

Washington State University), Ph.D. (Anthropology; Washington State University, USA)

Dr. Colin MacAndrews, B.A. (History; Cambridge University, England), M.A. (Political Science; York University, Canada), Ph.D. (Political Science; MIT, USA)

| RESEARCH INTERESTS |

Areas of research interest in the Division include: Asian Studies; Babi and Baha'i Studies; Nationalism and Social Change; Politics and the Media; Sociology of Religion; Southeast Asian History; Thai Buddhism; Women in Southeast Asia; Religious Influence on Thai Society; Poverty and Rural Development; Southeast Asian Press and Media; Youth and Information & Communications Technology; Thai Cinema; Public participation in environment and technological decision making; the social impacts of technology; ethics in social research; managing the Mekong river; drug policy pertaining to the use of illicit drugs; the sociology of consumerism; the environmental movement; social protest.

SOCIAL SCIENCE MAJOR

| DEGREE OFFERED |

Bachelor of Arts (Social Science)

B.A. (Social Science)

There are 3 concentrations:

1. International Studies
2. Modern World History
3. Southeast Asian Studies

| THE FIELD |

All students in the Social Science major take a set of common core courses designed to introduce them to the key elements of theory and methodology in the Social Sciences as well as various issues and aspects of the modern world. They are also required to conduct some independent research and write a dissertation in their chosen subject area. Critical and original thinking is encouraged. Students also have the opportunity to attend and help organize MUIC Social Science conferences and to participate in seminar discussions. The whole program is subject to regular review so that course materials and content can be improved. A consultative relationship between faculty and students is fostered.

International Studies:

The International Studies concentration offers students an introduction to selected aspects of contemporary world affairs. Students can choose from a range of courses dealing with international relations; global society and economy; and selected area studies. In addition, all International Studies students are given an extensive introduction to modern world history, study various global issues, and are able to take intensive courses on various world regions.

Modern World History:

The Modern World History concentration provides students with an introduction to world history in the modern period (c. 1450 to the present). Students can choose from a range of courses in comparative history, Asian studies, European and Russian studies, and studies of the Americas (Latin America and North America). Some courses on other world regions are also available.

Southeast Asian Studies:

The Southeast Asian Studies concentration provides students with a comprehensive introduction to modern Southeast Asia, with required courses on the geography, history, religions, political systems, economics and gender relations of the region, and electives in a wide range of specific topics relating to the societies, culture and arts of Southeast Asia, some with a particular reference to Thailand.

| CAREER OPPORTUNITIES |

Studying for a degree in Social Science (International Studies/Modern World History/ Southeast Asian Studies) should accomplish two objectives: (1) to give students a good knowledge of a particular subject area and (2) to train students in the critical analysis of systems of ideas, enabling them to analyze, evaluate and correlate new information and apply theory to practice. Both of these objectives are relevant in pursuing a career. Thus, the analytical skills which the student acquires in the process of studying their subject area can be used in entirely different types of careers. Careers which may be of particular interest to Social Science graduates include: international business, work in international and non-governmental organizations, journalism and the media, and higher education both in teaching and administration. A Social Science undergraduate degree also provides an excellent basis for many higher degrees, including International Relations.

| CURRICULUM STRUCTURE |**| Social Science Major |**

Courses	Credits
General Education Courses	60
Core Social Science Courses	28
Required Major Courses	
- International Studies	24
- Modern World History	24
- Southeast Asian Studies	36
Elective Major Courses	
- International Studies	60
- Modern World History	60
- Southeast Asian Studies	48
Free Elective Courses	8
TOTAL	180

| COURSE LIST |**General Education Courses****60 credits**

Social Science Students are not permitted to take General Education Classes in the Natural & Social Sciences which are recoded versions of classes they are taking for their major.

English Communication**16 credits**

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)
ICCM	111	Advanced English Communication I	4 (4-0-8)
ICCM	112	Advanced English Communication II	4 (4-0-8)
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	243	Belief Systems in English Usage	4 (4-0-8)
ICEG	250	Introduction to Linguistics	4 (4-0-8)
ICEG	265	Literature into Film	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 course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences**16 credits**

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)
ICNS	111	Fundamental Biology	4 (4-0-8)
ICNS	121	Fundamental Chemistry	4 (4-0-8)
ICNS	131	Fundamental Physics	4 (4-0-8)

ICNS 141	Computer Essentials*	4 (3-2-7)
ICNS 142	Internet Technology	4 (3-2-7)
ICNS 152	Southeast Asian Ecology	4 (4-0-8)
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 (4-0-8)
ICNS 162	Southeast Asian Geography	4 (4-0-8)
ICNS 171	The Scientific Approach and Society	4 (3-2-7)
ICNS 211	The Science of Food	4 (4-0-8)
ICNS 256	Sustainable Development	4 (4-0-8)
ICNS 257	Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: *Mandatory Courses

Humanities		12 credits
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 106	Moral and Ethical Studies*	4 (4-0-8)
ICHM 107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM 140	Elements of Art Theory*	4 (4-0-8)
ICHM 141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM 142	Art Appreciation II (18 th century - Present)	4 (4-0-8)
ICHM 143	Introduction to Photography	4 (3-2-7)
ICHM 144	Intermediate Photography	4 (3-2-7)
ICHM 203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM 213	Elements of Knowledge Representation	4 (4-0-8)
ICHM 216	Ethics and Politics	4 (4-0-8)
ICHM 218	Film Studies	4 (4-0-8)
ICHM 223	Thai Arts	4 (4-0-8)
ICHM 225	Western Classical Ideal*	4 (4-0-8)
ICHM 241	Introduction to Drawing	2 (1-2-3)
ICHM 242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

Social Sciences			12 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	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	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 in 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 Civilizations of East Asia	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	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	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	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	332	Introduction to Human Rights	4 (4-0-8)
ICSS	335	SEA Arts I	4 (4-0-8)
ICSS	337	Introduction to Southeast Asian Dance & Theater	4 (4-0-8)
ICSS	344	Introduction to North America History since 1900	4 (4-0-8)
ICSS	346	Introduction to Europe History since 1945	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 in the Modern World	4 (4-0-8)
ICSS	374	Introduction to International Organizations	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)
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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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)
ICPE	122	Selected Topics in Sports	1 (0-3-1)
ICPE	123	Cycling	1 (0-3-1)

Major Courses **112 credits**

Core Social Science Courses **28 credits**

ICSO	202	Major Social Institutions	4 (4-0-8)
ICSO	205	Paradigms in the Social Sciences I	4 (4-0-8)
ICSO	206	Paradigms in the Social Sciences II	4 (4-0-8)
ICSO	301	Research Methods in the Social Sciences	4 (4-0-8)
ICSO	332	Human Rights	4 (4-0-8)
ICSO	401	Independent Study in the Social Sciences	4 (4-0-8)
ICSO	402	Research Seminar	4 (4-0-8)

1. International Studies Concentration

Required Courses **24 credits**

ICSO	203	Global Change in the Late Twentieth Century	4 (4-0-8)
ICSO	204	Academic Methodologies for the Social Science	4 (4-0-8)
ICSO	210	World History A (c. 1400-1763)	4 (4-0-8)
ICSO	211	World History B (c. 1763-1914)	4 (4-0-8)
ICSO	212	World History C (c. 1914-1945)	4 (4-0-8)
ICSO	213	World History D (c. 1945-2000)	4 (4-0-8)

Elective Courses **60 credits**

Note 1: Electives can be chosen from any approved higher level Social Science courses. We require students to take at least two elective theory courses, and in addition, we normally expect them to take elective courses from any two focus areas in their concentration (at least 6 electives from each area where available). However, if a student wants to take most (at least 10) or all of their elective focus area courses from one area rather than two, this is acceptable. In all cases, the choice of electives requires the approval of the

concentration advisor.

Note II: Focus Areas

- For International Studies the focus areas which are presently available are as follows:

1. Comparative Studies
2. International Relations
3. Global Society and Economy
4. Area Studies : If 6 courses are chosen from one specific area in Modern World History and Southeast Asian

Studies then this can count as a INS focus area

- East and South Asian Studies
- European and Russian Studies
- American and Pacific Studies
- Southeast Asian Studies

Social Theory Courses

INS Students must follow at least two of the following

ICHM	220	European Enlightenment	4 (4-0-8)
ICSO	283	International Cultural Studies	4 (4-0-8)
ICSO	302	Historiography	4 (4-0-8)
ICSO	303	Modern Social Theory	4 (4-0-8)
ICSP	250	History and Systems of Psychology	4 (4-0-8)

Focus Areas

1.Comparative Studies Focus Area

ICSO	201	Human Geography	4 (4-0-8)
ICSO	207	The History of the World Economy	4 (4-0-8)
ICSO	276	History of War	4 (4-0-8)
ICSO	280	Gender Issues in the Modern World	4 (4-0-8)
ICSO	281	The Social Impact of Science and Technology	4 (4-0-8)
ICSO	282	Global Media and Social Change	4 (4-0-8)
ICSO	284	History of Disease and Medicine	4 (4-0-8)
ICSO	364	Slavery and Human Trafficking	4 (4-0-8)
ICSO	365	Genocide and Ethnic Cleansing	4 (4-0-8)
ICSO	373	Conflict resolution	4 (4-0-8)
ICSO	374	Revolution, Terrorism and the Modern State	4 (4-0-8)
ICSO	376	War, the Military, Society, and the State	4 (4-0-8)
ICSO	378	International Law and the State	4 (4-0-8)
ICSO	381	Ethnicity, Society and the State	4 (4-0-8)
ICSO	382	Religion, Society and the State	4 (4-0-8)

ICSA 312 Ethnicity and Nationalism in Southeast Asia 4 (4-0-8)

2. International Relations Focus Area

ICSO 271 International Relations 4 (4-0-8)
 ICSO 272 Comparative Political Systems 4 (4-0-8)
 ICSO 273 World Politics and World Order 4 (4-0-8)
 ICSO 274 International Organizations 4 (4-0-8)
 ICSO 275 Democracy as a Political System 4 (4-0-8)
 ICSO 309 Political Movements 4 (4-0-8)
 ICSO 370 Diplomacy and Negotiation 4 (4-0-8)
 ICSO 371 Foreign Policy of the Major Powers Since 1945 4 (4-0-8)
 ICSO 377 Devolution, Privatization and the State 4 (4-0-8)
 ICSO 378 International Law and the State 4 (4-0-8)

3. Global Society and Economy Focus Area

ICSO 261 Economic Geography 4 (4-0-8)
 ICSO 262 Global Resources 4 (4-0-8)
 ICSO 263 Population and Migration in the Modern World 4 (4-0-8)
 ICSO 264 The World Economy since 1945 4 (4-0-8)
 ICSO 285 Drugs and Society 4 (4-0-8)
 ICSO 360 Patterns and Consequences of Development 4 (4-0-8)
 ICSO 366 Indigenous Cultures in the Modern World 4 (4-0-8)
 ICSO 367 Environmental Issues in Social Context 4 (4-0-8)
 ICSO 369 NGOs and Political and Business Contexts 4 (4-0-8)
 ICSO 383 International Crime and Law Enforcement 4 (4-0-8)
 ICSO 390 Tourism, Development and Cultural Change 4 (4-0-8)

Other Approved Courses

4. Area Studies

- Asian Studies:

East Asia

ICSO 231 Modern History of East Asia 4 (4-0-8)
 ICSO 232 Civilizations of East Asia 4 (4-0-8)
 ICSO 341 Society, Politics and Economics in Contemporary East Asia 4 (4-0-8)
 ICSO 350 Contemporary China and the Chinese World 4 (4-0-8)
 ICSO 351 Contemporary Japan and Korea 4 (4-0-8)

South Asia

ICSO 234 The Indian Sub-Continent up to c. 1500 4 (4-0-8)
 ICSO 235 The Indian Sub-Continent since c. 1500 4 (4-0-8)

ICSO 342 Society, Politics and Economics in 4 (4-0-8)

Contemporary South Asia

- American and Australasian Studies:

Latin America

ICSO 241 Latin America Since 1800 4 (4-0-8)

ICSO 346 Society, Politics and Economics in Contemporary
Latin America & the Caribbean 4 (4-0-8)

North America

ICSO 243 North America c. 1763-1900 4 (4-0-8)

ICSO 244 The United States and Canada since 1900 4 (4-0-8)

ICSO 347 Society, Politics and Economics in Contemporary North America 4 (4-0-8)

The Americas: North and South

ICSO 355 Religion in the Americas 4 (4-0-8)

Australasia

ICSO 237 Australasia Since 1770 4 (4-0-8)

ICSO 343 Society, Politics and Economics in Contemporary Australasia 4 (4-0-8)

- European and Russian Studies:

Europe

ICSO 246 Europe Since 1945 4 (4-0-8)

ICSO 247 The European Union: Development, Institutions and Politics 4 (4-0-8)

ICSO 250 The European Classical Heritage 4 (4-0-8)

ICSO 251 Medieval and Renaissance: Europe 4 (4-0-8)

ICSO 252 Early Modern Europe, c. 1450 - c.1700 4 (4-0-8)

ICSO 253 The European Ancien Regime and Revolution, c.1700 - c. 1830 4 (4-0-8)

ICSO 254 European Society and Culture, c. 1830 - c. 1945 4 (4-0-8)

ICSO 348 Society, Politics and Economics in Contemporary Europe 4 (4-0-8)

ICHM 217 The European Enlightenment 4 (4-0-8)

Russia

ICSO 248 Russia and The Soviet Union since 1800 4 (4-0-8)

ICSO 349 Society, Politics and Economics in Contemporary
Russia and the Former Soviet Republics 4 (4-0-8)

-Southeast Asian Studies:

ICSA 203 The History of Southeast Asia up to 1800 4 (4-0-8)

ICSA 204 Modern History of Southeast Asia, c. 1800-Present 4 (4-0-8)

ICSA	206	Political Systems of Southeast Asia	4 (4-0-8)
ICSA	211	Economics of Southeast Asia	4 (4-0-8)
ICSA	255	Thai Economic History	4 (4-0-8)
ICSA	311	International Politics in Southeast Asia	4 (4-0-8)
ICSA	312	Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSA	321	Religion, Society and Politics in Mainland Southeast Asia	4 (4-0-8)
ICSA	322	Religion, Society and Politics in Maritime Southeast Asia	4 (4-0-8)

Note I :

-Courses on African and Middle Eastern History can also be taken when available.

-Approved Courses from Other Majors

ICEC	201	Macroeconomics	4 (4-0-8)
ICEC	202	Microeconomics	4 (4-0-8)
ICHM	201	The Western Classical Ideal	4 (4-0-8)
ICHM	219	Twentieth Century Philosophy	4 (4-0-8)

2. Modern World History Concentration**Required Courses** **24 credits**

ICSO	204	Academic Methodologies for the Social Science	4 (4-0-8)
ICSO	210	World History A (c. 1400-1763)	4 (4-0-8)
ICSO	211	World History B (c. 1763-1914)	4 (4-0-8)
ICSO	212	World History C (c. 1914-1945)	4 (4-0-8)
ICSO	213	World History D (c. 1945-2000)	4 (4-0-8)
ICSO	302	Historiography	4 (4-0-8)

Elective Courses **60 credits**

Note I: Electives can be chosen from any approved higher level Social Science courses. Normally, we expect students to take most of their elective courses from any two focus areas in their concentration (at least 6 electives from each area where available), but if a student wants to take most (at least 10) or all of their elective courses from one focus area, this is acceptable. In all cases, the choice of electives requires the approval of the concentration advisor.

Note II: Focus Areas

- For Modern World History the focus areas which are presently available are as follows:

1. Comparative and General History
2. Asian Studies
3. American and Australasian Studies
4. European and Russian Studies

- General survey courses on African & Middle Eastern History may be made available over the next two years and

will be provisionally included in the Comparative and General History section until an appropriate focus area can be developed.

Focus Areas

1. Comparative and General History Focus Area:

Comparative Studies

ICSO	201	Human Geography	4 (4-0-8)
ICSO	203	Global Change in the Late Twentieth Century	4 (4-0-8)
ICSO	364	Slavery and Human Trafficking	4 (4-0-8)
ICSO	365	Genocide and Ethnic Cleansing	4 (4-0-8)
ICSO	374	Revolution, Terrorism and the Modern State	4 (4-0-8)
ICSO	376	War, the Military, Society, and the State	4 (4-0-8)
ICSO	378	International Law and the State	4 (4-0-8)
ICSO	381	Ethnicity, Society and the State	4 (4-0-8)
ICSO	382	Religion, Society and the State	4 (4-0-8)
ICSA	312	Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)

General History

ICSO	207	The History of the World Economy	4 (4-0-8)
ICSO	276	History of War	4 (4-0-8)
ICSO	284	History of Disease and Medicine	4 (4-0-8)
ICSO	371	Foreign Policy of the Major Powers Since 1945	4 (4-0-8)

African and Middle Eastern Studies

ICSO	238	Africa Since 1800	4 (4-0-8)
ICSO	344	Society, Politics and Economics in Contemporary Africa	4 (4-0-8)
ICSO	239	The Middle East Since 1800	4 (4-0-8)
ICSO	345	Society, Politics and Economics in the Contemporary Middle East	4 (4-0-8)

2. Asian Studies Focus Area:

East Asia

ICSO	231	Modern History of East Asia	4 (4-0-8)
ICSO	232	Civilizations of East Asia	4 (4-0-8)
ICSO	341	Society, Politics and Economics in Contemporary East Asia	4 (4-0-8)
ICSO	350	Contemporary China and the Chinese World	4 (4-0-8)
ICSO	351	Contemporary Japan and Korea	4 (4-0-8)

South Asia

ICSO	234	The Indian Sub-Continent up to c. 1500	4 (4-0-8)
ICSO	235	The Indian Sub-Continent since c. 1500	4 (4-0-8)

ICSO 342 Society, Politics and Economics in Contemporary South Asia 4 (4-0-8)

Southeast Asia (All SEA Courses)

ICSA 203 The History of Southeast Asia up to 1800 4 (4-0-8)

ICSA 204 Modern History of Southeast Asia, c. 1800-Present 4 (4-0-8)

ICSA 206 Political Systems of Southeast Asia 4 (4-0-8)

ICSA 211 Economics of Southeast Asia 4 (4-0-8)

ICSA 255 Thai Economic History 4 (4-0-8)

ICSA 311 International Politics in Southeast Asia 4 (4-0-8)

ICSA 312 Ethnicity and Nationalism in Southeast Asia 4 (4-0-8)

ICSA 321 Religion, Society and Politics in Mainland Southeast Asia 4 (4-0-8)

ICSA 322 Religion, Society and Politics in Maritime Southeast Asia 4 (4-0-8)

3. American and Australasian Studies Focus Area:

Latin America

ICSO 241 Latin America Since 1800 4 (4-0-8)

ICSO 346 Society, Politics and Economics in Contemporary
Latin America & the Caribbean 4 (4-0-8)

North America

ICSO 243 North America c. 1763-1900 4 (4-0-8)

ICSO 244 The United States and Canada since 1900 4 (4-0-8)

ICSO 347 Society, Politics and Economics in Contemporary North America 4 (4-0-8)

The Americas: North and South

ICSO 355 Religion in the Americas 4 (4-0-8)

Australasia

ICSO 237 Australasia Since 1770 4 (4-0-8)

ICSO 343 Society, Politics and Economics in Contemporary Australasia 4 (4-0-8)

4. European and Russian Studies Focus Area:

Europe

ICSO 246 Europe Since 1945 4 (4-0-8)

ICSO 247 The European Union: Development, Institutions and Politics 4 (4-0-8)

ICSO 250 The European Classical Heritage 4 (4-0-8)

ICSO 251 Medieval and Renaissance: Europe 4 (4-0-8)

ICSO 252 Early Modern Europe, c. 1450 - c.1700 4 (4-0-8)

ICSO 253 The European Ancien Regime and Revolution, c. 1450 - c.1700 4 (4-0-8)

ICSO 254 European Society and Culture, c. 1830 - c. 1945 4 (4-0-8)

ICSO 348 Society, Politics and Economics in Contemporary Europe 4 (4-0-8)

ICHM	217	The European Enlightenment	4 (4-0-8)
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Russia

ICSO	248	Russia and The Soviet Union since 1800	4 (4-0-8)
ICSO	349	Society, Politics and Economics in Contemporary Russia and the Former Soviet Republics	4 (4-0-8)

3. Southeast Asian Studies Concentration**Required Courses** **36 credits**

ICSO	204	Academic Methodologies for the Social Science	4 (4-0-8)
ICSA	201	Geography of Southeast Asia	4 (4-0-8)
ICSA	203	The History of Southeast Asia up to 1800	4 (4-0-8)
ICSA	204	Modern History of Southeast Asia, c. 1800-Present	4 (4-0-8)
ICSA	207	Contemporary History of Southeast Asia, c. 1948-Present	4 (4-0-8)
ICSA	211	Economics of Southeast Asia	4 (4-0-8)
ICSA	312	Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSA	321	Religion, Society and Politics in Mainland Southeast Asia	4 (4-0-8)
ICSA	322	Religion, Society and Politics in Maritime Southeast Asia	4 (4-0-8)

Elective Courses **48 credits****Social Theory Courses**

ICSO	283	International Cultural Studies	4 (4-0-8)
ICSO	302	Historiography	4 (4-0-8)
ICSO	303	Modern Social Theory	4 (4-0-8)

Other SEA Electives

Note 1: These may be chosen from any of the courses in the following categories: SEA Economy and Society; Aspects of SEA Culture; and Country Studies, but must include at least two Country Studies.

SEA Economy and Society

ICSA	202	Ecology of Southeast Asia	4 (4-0-8)
ICSA	208	Southeast Asian Archaeology	4 (4-0-8)
ICSA	213	Poverty and Rural Development in Southeast Asia	4 (3-2-7)
ICSA	254	Introduction to Thai History	4 (4-0-8)
ICSA	255	Thai Economic History	4 (4-0-8)
ICSA	311	International Politics in Southeast Asia	4 (4-0-8)
ICSA	313	Economic History of Southeast Asia	4 (4-0-8)
ICSA	314	Economic Problems in Southeast Asia	4 (4-0-8)
ICSA	315	Globalization in Southeast Asia	4 (4-0-8)
ICSA	317	Political Systems of Southeast Asia I	4 (4-0-8)
ICSA	318	Political Systems of Southeast Asia II	4 (4-0-8)
ICSA	329	Indigenous Peoples of Southeast Asia	4 (4-0-8)

ICSA	411	Law and Society in Southeast Asia	4 (4-0-8)
ICSA	412	Population Movements and Diasporas in Southeast Asia	4 (4-0-8)

Aspects of SEA Culture

ICSA	231	Southeast Asian Arts I	4 (4-0-8)
ICSA	233	Dance and Theatre in Southeast Asia	4 (4-0-8)
ICSA	234	Southeast Asian Cinema	4 (4-0-8)
ICSA	331	Southeast Asian Arts II	4 (4-0-8)
ICSA	333	Media and Politics in Southeast Asia	4 (4-0-8)
ICSA	334	Gender and Identity in Southeast Asia	4 (4-0-8)
ICSA	431	Urban Anthropology of Southeast Asia	4 (4-0-8)

Country Studies

ICSA	420	Contemporary Issues in Thailand	4 (4-0-8)
ICSA	421	Contemporary Issues in Burma	4 (4-0-8)
ICSA	422	Contemporary Issues in Malaysia	4 (4-0-8)
ICSA	423	Contemporary Issues in Indonesia	4 (4-0-8)

Free Elective Courses**8 credits**

Note: Students can take any MUIC courses as a free elective.



**MAHIDOL
UNIVERSITY**
Wisdom of the Land

International College



TOURISM AND HOSPITALITY MANAGEMENT DIVISION

| DIVISION CHAIRMAN |

Assistant Professor Dr. Chanin Yoopetch, B.A. (Emphasis in Economics; The University of the Thai Chamber of Commerce), M.B.A. (Emphasis in Finance; Toledo, Ohio, USA), Ph.D. (Management Development; National Institute of Development Administration)

| FACULTY MEMBERS |**| Full-Time |**

Dr. Kannapa Pongponrat, B.A. (International Affairs; Thammasat University), M.A. (Development Administration; Western Michigan University, USA), Ph.D. (Regional and Rural Development Planning; Asian Institute of Technology)

Ms. Kaewta Muangasame, B.A. (Communication Art; Rajabhat Institute Phranakhon), M.Sc. (International Hospitality Management; Leeds Metropolitan University, The United Kingdom)

Dr. Pisut Yuwanond, Dip. (Hotel Management; Les Roches, Switzerland), B.S.B.A. (Travel Industry Management and Marketing; Hawaii Pacific University, U.S.A.), M.S.I.S. (Information Systems; Hawaii Pacific University, U.S.A), Ph.D. (Business Administration; Southern California University, U.S.A.)

Ms. Nate-tra Tevabanchachai, Dip. (Secretarial Program; Hotel management Centre International de Glion, Switzerland), B.Sc. (International Hospitality Management; Glion Management Center, Switzerland), M.Ed. (Organizational Training & Management in Hospitality Industry; Glion Management Center, Switzerland)

Dr. Chen Ka Tat Nixon, Professional Dip. (General Management, Design Management and Marketing), Grad Dip. (Administration), M.A. (Cultural Management), Ph.D. (Architectural Heritage Management and Tourism)

Assistant Professor Dr. Sompong Amnuay-ngerntra, B.A. (Journalism; Thammasat University), M.I.T.M (Tourism Management; Southern Cross University, Australia), Ph.D. (Architectural Heritage Management and Tourism, Silpakorn University)

Dr. Veerades Panvisavas, B.A. (Travel Industry Management; Mahidol University International College), M.A. (Hospitality and Management; University of Birmingham, United Kingdom), Ph. D. (Hospitality and Tourism Management; University of Strathclyde Glasgow, United Kingdom)

Ms. Walanchalee Wattanacharoensil, B.Sc. (Computer Science; Thammasat University), M.I.B. (International Business; University of Wellongong, Dubai Campus)

|Part-Time|

Mr. Christophe Mercier, B.Sc. (Management of Human Resources; Bellevue University, U.S. A.), M.M. (Economie et de Management, spécialité Hôtellerie Internationale; Université de Perpignan, France), Executive MBA (International Hotel Management; Vatel International Business School, France)

Dr. Daniel Fuchs, B.A. (Accounting; University of Zurich, Switzerland), M.A. (Finance; University of Zurich, Switzerland), Ph.D. (Hotel Management; Ecole Superior de Robert Sorbon, France)

Mr. Harvey Sebastian Taylor, B.B.S. (Business; University of Glamorgan, UK), LL.B. (Law; University of London, UK), M.Ed. (Curriculum and Instruction; Assumption University)

Ms. Naphawan Chantrodoan, B.A. (Travel Industry Management; Mahidol University International College), MSc. (Tourism and Hospitality Management; School of Economics and Commercial Law, Gothenburg University, Sweden)

Ms. Pimwadee Phandhumkomol, B.A. (Accountancy; Chulalongkorn University), M.A. (Professional Accounting; University of Texas at Austin, U.S.A.)

Ms. Quanvari Pramoj na Ayudhaya, LL.B. (Thammasat University), LL.M. (Maritime Law; University College London, University of London)

Mr. Rangson Chirakranon, B.B.A. (Marketing; Bangkok University), M.Sc. (Home Economic; Kasetsart University), Associate Degree (Culinary Arts; Johnson & Wales University, U.S.A.)

Ms. Veerisa Chotiyaputta, B.A. (Finance and Accounting; Richmond University, United Kingdom), M.B.A. (International Accounting; Richmond University, United Kingdom)

| RESEARCH INTERESTS |**Assistant Professor Dr. Chanin Yoopetch**

- Tourism Research
- Knowledge Management
- Consumer Behavior

Dr. Chen Ka Tat Nixon

- Museum Studies
- Cultural Heritage Management
- Consumer Behavior
- Marketing

Ms. Kaewta Muangasame

- Crisis management in Tourism
- Crisis communication tools
- Green tourism
- Green tourist (shades of green tourist behavior)
- Marketing for sustainable tourism development

Dr. Kannapa Pongponrat

- Sustainable Development
- Sustainable Planning
- Participation
- Community-based Development
- Vulnerability Assessment
- Sustainable Tourism/ Responsible Tourism
- Environment Management
- Disaster Community Preparedness

Ms. Nate-tra Tevabanchachai

- Hotel Management
- Leadership
- Human Resource and Training

Dr. Pisut Yuwanond

- Hotel management and marketing
- Hospitality management and marketing

Assistant Professor Dr. Sompong Amnuay-ngerntra

- Heritage Tourism Management
- Heritage Interpretation
- Destination Marketing Strategy: Product Development

Dr. Sunanta Chutinan

- Cultural Heritage Management & Planning
- Interpretation
- Tourism Development & Planning
- Marketing

Dr. Veerades Panvisavas

- Strategic Management
- Internationalization and entry modes
- Social Responsibility of the Business

Ms. Walanchalee Wattanacharoensil

- Service quality management in Airline Industry
- Service quality management in Healthcare Industry
- Corporate Social Responsibility in Airline

TOURISM AND HOSPITALITY MANAGEMENT

MAJOR

| DEGREE OFFERED |

Bachelor of Business Administration (Tourism and Hospitality Management)

B.B.A. (Tourism and Hospitality Management)

There are 2 Modules:

1. Travel and Sustainable Tourism Development
2. Hospitality Management

| THE FIELD |

Tourism is one of the fastest growing and most dynamic industries in the world. This is especially true in Thailand where tourism has enormous importance for both the public and private sectors.

In line with industry needs, the focus of the THM major is the critical interface between theory and practice. This is clearly demonstrated by the courses' strong vocational nature and their analytical approach to this global industry.

As part of its commitment to both students and industry, MUIC recently opened its own fully functional 4-star training hotel, where students can gain a genuine insight into the running and management of a live hotel and experience real life situations, functions, guests and conferences.

At MUIC, the integration of faculty expertise, industry links and state of the art facilities provide the most comprehensive training environment in Thailand.

To provide students with a greater range of career options, Tourism and Hospitality Management Division provides two modules from which students can choose.

Travel & Sustainable Tourism Development Module:

The Travel & Sustainable Tourism Development Module engages students in the areas of tourism business management, destination planning and development, destination marketing management, tourism promotion, and tourism resource management. This module also develops analytical thinking towards the planning, development and management of the industry. The sustainable tourism development module prepares students towards reducing environmental impacts, increasing benefits for stakeholder communities, safeguarding the future livelihood of local people and ensuring the protection of destinations for future generations.

Hospitality Management Module:

The Hospitality Management Module focuses on the importance of quality services within hotels, strategic management, service marketing, human resource training and development, food and beverage management, event management, and feasibility studies and business development in the industry. In this module students are trained within the individual departments of a hotel, and more importantly, they are trained from a managerial perspective. The students also have the opportunity to put the management training and theory into practice during their internships with industry practitioners.

| CAREER OPPORTUNITIES |

According to leading authorities, including the Thai Hotel Association (THA) and Tourism Authority of Thailand (TAT), the tourism and hospitality industry in Thailand needs more than 8,000 new graduates over the next 5 years. This is, therefore, an industry that provides unique opportunities for career advancement and professional development.

The MUIC Tourism and Hospitality Management Division is Thailand's leading force in the training of middle and senior management professionals of the future. It has established excellent links with the industry and has a growing national and international reputation for quality in Tourism and Hospitality education.

| CURRICULUM STRUCTURE |**| Tourism and Hospitality Management Major |**

Courses	Credits
General Education Courses	52
Core Courses	28
Required Major Courses	64
Elective Major Courses	32
Free Elective Courses	8
TOTAL	184

| COURSE LIST |

General Education Courses	52 credits
English Communication	16 credits
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)
ICCM 111 Advanced English Communication I	4 (4-0-8)
ICCM 112 Advanced English Communication II	4 (4-0-8)
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)

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 course 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 required to successfully complete ICME100-English Resource Skills, a non-credit course, before moving on to ICCM104.

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: ICCM111 and ICCM112 in order, and finally, any 200+ level English course.

Natural Sciences		12 credits
ICNS 101	Introduction to Mathematics*	4 (4-0-8)
ICNS 111	Fundamental Biology	4 (4-0-8)
ICNS 121	Fundamental Chemistry	4 (4-0-8)
ICNS 131	Fundamental Physics	4 (4-0-8)
ICNS 141	Computer Essentials*	4 (3-2-7)
ICNS 142	Internet Technology	4 (3-2-7)
ICNS 152	Southeast Asian Ecology	4 (4-0-8)
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 (4-0-8)
ICNS 162	Southeast Asian Geography	4 (4-0-8)
ICNS 171	The Scientific Approach and Society	4 (3-2-7)
ICNS 211	The Science of Food	4 (4-0-8)
ICNS 256	Sustainable Development	4 (4-0-8)
ICNS 257	Environmental Issues: Past, Present and Future	4 (4-0-8)

Note: *Mandatory Courses

Humanities		12 credits
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 106	Moral and Ethical Studies*	4 (4-0-8)
ICHM 107	Introduction to Asian Philosophy*	4 (4-0-8)
ICHM 140	Elements of Art Theory*	4 (4-0-8)
ICHM 141	Art Appreciation (Ancient Art - Renaissance & Baroque)	4 (4-0-8)
ICHM 142	Art Appreciation II (18 th century - Present)	4 (4-0-8)

ICHM	143	Introduction to Photography	4 (3-2-7)
ICHM	144	Digital Photography	4 (3-2-7)
ICHM	203	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	Enlightenment in European Literature	4 (4-0-8)
ICHM	213	Elements of Knowledge Representation	4 (4-0-8)
ICHM	216	Ethics and Politics	4 (4-0-8)
ICHM	218	Film Studies	4 (4-0-8)
ICHM	223	Thai Arts	4 (4-0-8)
ICHM	225	Western Classical Ideal*	4 (4-0-8)
ICHM	241	Introduction to Drawing	2 (1-2-3)
ICHM	242	Intermediate Drawing	2 (1-2-3)
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)
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)
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)
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)
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)
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)

Note I: All non-FAA students must take at least ONE of the six available compulsory Humanities courses ICHM101, ICHM103, ICHM 106, ICHM107, ICHM140, or ICHM225.

These students must then either follow the 'culture track', taking any 2 additional Humanities courses, or follow the 'language track', taking sequential (Elementary 1 and Elementary 2, or Elementary 2 and Elementary 3) courses in any one of the foreign language programs.

Note II: THM students must follow their compulsory Humanities course by following the 'language track', described in the preceding paragraph.

Note III: FAA students must take 3 Humanities courses to fulfill their General Education requirement, but they do not have any compulsory Humanities courses. It is recommended, but not required, that they take the following courses: ICHM105, ICHM142, and ICHM143.

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	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	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	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	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	251	Developmental Psychology I	4 (4-0-8)
ICSS	252	Developmental Psychology II	4 (4-0-8)
ICSS	332	Introduction to Human Rights	4 (4-0-8)

Note: *Mandatory Courses

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	114	Thai Sports	1 (0-3-1)
ICPE	115	Self Defense	1 (0-3-1)
ICPE	116	Adapted Physical Activities	2 (1-2-3)
ICPE	117	Physical Education: Mind and Body	1 (0-3-1)
ICPE	118	Physical Education: American Flag Football	1 (0-3-1)
ICPE	119	Physical Education: Weight Training	1 (0-3-1)
ICPE	121	Physical Education: Soccer	1 (0-3-1)

Tourism and Hospitality Management Courses **124 credits**

Core Courses **28 credits**

ICBC	201	Business Communication I	4 (4-0-8)
ICBC	202	Business Communication II	4 (4-0-8)
ICTM	200	Fundamental Accounting	4 (4-0-8)
ICTM	201	Principles of Marketing	4 (4-0-8)
ICTM	212	Introduction to Travel Industry	4 (4-0-8)
ICMS	301	Management and Organizational Behavior	4 (4-0-8)
ICTM	401	Strategic Management for Travel Industry	4 (4-0-8)

Note: Students are required to earn at least a C grade in each of these courses.

Required Courses **64 credits**

ICML	103	Elementary German III*	4 (4-0-8)
ICML	113	Elementary Japanese III*	4 (4-0-8)
ICML	123	Elementary French III*	4 (4-0-8)
ICML	133	Elementary Chinese III*	4 (4-0-8)
ICML	163	Elementary Thai III*	4 (4-0-8)
ICTM	210	Accounting for Travel Industry	4 (4-0-8)
ICTM	211	Statistics for Travel Industry	4 (4-0-8)
ICTM	213	Finance for Travel Industry	4 (4-0-8)
ICTM	310	Event Management	4 (3-2-7)
ICTM	311	Sales and Marketing for Travel Industry	4 (4-0-8)
ICTM	312	Human Resources Management for Travel Industry	4 (4-0-8)
ICTM	352	Tourism and Hospitality Law	4 (4-0-8)
ICTM	400	Tourism Business Management	4 (4-0-8)
ICTM	413	Service and Quality Management	4 (4-0-8)
ICTM	414	Ethics in Hospitality Operations	4 (4-0-8)
ICTM	420	Sustainable Tourism Studies	4 (3-2-7)
ICTM	461	Travel Industry Management: Internship I	12 (0-48-12)
ICTM	480	Tourism and Hospitality Research Methods	4 (4-0-8)

Note: Students must continue with level III in a foreign language other than in their native language or English.

Major Elective Courses			32 credits
Travel & Sustainable Tourism Development Module			
ICTM	214	Economics of Tourism	4 (4-0-8)
ICTM	270	Consumer Behavior in Tourism	4 (4-0-8)
ICTM	307	International Travel & Tourism	4 (4-0-8)
ICTM	313	Tourism Environments	4 (3-2-7)
ICTM	319	Eco-tourism Studies	4 (3-2-7)
ICTM	330	Cultural Heritage Management	4 (4-0-8)
ICTM	331	Guide to Tourist Health and Safety	4 (4-0-8)
ICTM	341	Wilderness Tourism Management	4 (3-2-7)
ICTM	370	Technology for Tourism Industry	4 (4-0-8)
ICTM	410	Passenger Transportation Management	4 (4-0-8)
ICTM	423	Seminar in Tourism Planning and Promotion	4 (4-0-8)
ICTM	428	Tourism Guide	4 (3-2-7)
ICTM	430	Managing Package Tourism	4 (4-0-8)
ICTM	431	Rural Tourism	4 (4-0-8)
ICTM	433	Tourism in Developing Countries	4 (4-0-8)
ICTM	462	Travel Industry Management: Internship II	12 (0-48-12)
ICTM	471	Seminar in Tourism Industry	4 (4-0-8)
ICTM	472	Airline Business Management	4 (4-0-8)
Hospitality Management Module			
ICTM	320	Lodging Property Management	4 (4-0-8)
ICTM	323	Front Office Management	4 (4-0-8)
ICTM	324	Food and Beverage Management	4 (4-0-8)
ICTM	325	Housekeeping Management	4 (4-0-8)
ICTM	442	Hospitality Training	4 (4-0-8)
ICTM	462	Travel Industry Management: Internship II	12 (0-48-12)
ICTM	473	Seminar in Service Management	4 (4-0-8)
ICTM	474	Supervision in Hospitality Business	4 (4-0-8)
ICTM	475	Introduction to Culinary Arts	4 (3-2-7)
ICTM	477	Hospitality Facilities Management	4 (4-0-8)
ICTM	478	Facilities Development & Planning in Hospitality	4 (4-0-8)
Free Elective Courses			8 credits

Students can take any MUIC courses as a free elective.



**MAHIDOL
UNIVERSITY**
Wisdom of the Land

International College



MINORS

| BUSINESS ADMINISTRATION MINOR | (for non-BBA students)

Students from other majors besides Business Administration can earn a minor in Business Administration by completing the following eight subjects:

ICMB	201	Macroeconomics	4 (4-0-8)
ICMB	202	Microeconomics	4 (4-0-8)
ICMB	211	Fundamental Financial Accounting	4 (4-0-8)
ICMB	221	Principles of Marketing	4 (4-0-8)
ICMB	232	Essentials of Management	4 (4-0-8)
ICMB	233	Human Resource Management	4 (4-0-8)
ICMB	341	Business Law	4 (4-0-8)
ICMB	371	Business Finance	4 (4-0-8)

(Including all required pre-requisites for the above courses)

Note: Non-BBA students with a Cum GPA of 3.00 and above are encouraged to apply. Forms are available at the BA Office and the BA Secretaries would be able to guide the students through the rest of the application process. If you have any questions, please do not hesitate to contact the BA Office Manager who will be happy to advise students.

| ENGLISH STUDIES MINORS |

The core courses in English Communication do not make a student truly bilingual. However, the completion of a minor or a certificate in English Studies shows a level of knowledge with which the student is able to function well in any English-speaking environment or workplace.

Permission from both the English Studies Program Director and the student's advisor is required before any student undertakes a minor or a certificate program. Note that a GPA of 2.5 or above is recommended.

Students pursuing an English Studies minor are required to take 8 English Studies courses (32 credits) beyond their basic General Education English requirement (16 credits). Students must complete any seven 200+ level English courses plus ICEG490-Senior Project. Upon approval from the English Studies Program Director, students can substitute up to two English-related courses from outside the English Studies Program.

Students in the certificate program in English Studies must complete any four 200+ level courses beyond their basic General Education requirement.

Elective Courses - English Studies Minor or Certificate

(200+ level courses can also be used to meet the General Education English Language requirement, with appropriate permission)

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	461	Topics in Comparative Literature A: Poetry	4 (4-0-8)
ICEG	462*	Topics in Comparative Literature B: Short Story and Novel	4 (4-0-8)
ICEG	463*	Topics in Comparative Literature C: Drama	4 (4-0-8)
ICEG	484*	First and Second Language Acquisition	4 (4-0-8)

Compulsory Course–English Studies Minor

ICEG	490	Senior Project	4 (4-0-8)
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Please contact the English Studies Program Director, Mr Jonathan Green, if you are considering signing up for either the certificate or the minor.

| FOREIGN LANGUAGE MINORS |

The fact that English is today's international medium of communication does not imply that learning a second foreign language has become obsolete. A brief look at job advertisements shows that many important Thai and international companies need to recruit staff possessing a good command of at least another foreign language, if not two. As MUIC students plan for an international career, they must be ready to quickly learn and master (at least) an intermediate level of a foreign language or otherwise remain a complete stranger to their new working and cultural environment with all the drawbacks it implies.

At a more general level, knowledge of a second foreign language is a major personal enrichment. Not only does it help students develop communication abilities, allowing them to better understand and overcome communication handicaps in a truly international environment, but by introducing them to new ways of reasoning and of understanding/approaching the world, it broadens their intellectual scope.

The Foreign Language Program reflects this overall approach to modern language studies, and as a first step towards the development of full-fledged majors, is offering the minors and certificate programs listed below to students from other majors. Students pursuing a minor must complete 8 courses (32 credits) beyond those offered for the General Education requirement. Students in a certificate program must complete 4 additional courses (16 credits).

Permission from both the Foreign Language Program Director and the student's advisor is required before any student undertakes a certificate program or a minor. Interested students should contact the appropriate foreign language advisor.

Note that:

1. A student must have a minimum grade of C+ in level I, II & III of the elementary courses in the language he or she wishes to study. It is also recommended that a student has an overall GPA of 3.0 or higher.

2. The terms elementary and intermediate in the following course descriptions for the European languages refer to the definition of language proficiency levels given by the European Council. Students having completed a given level should be able to successfully pass the corresponding standardized language proficiency examinations. The same principle is applied to the Asian languages. The corresponding proficiency examination for Chinese is the “Chinese Level Test” (HSK), and for Japanese it is the Japanese Language Proficiency Test (JLPT).

4. BBA and TIM students taking a minor in a foreign language will be encouraged to do their final internship in an environment in which they will have to make use of the language competency acquired in their minor subject.

Advisor in charge of each minor:

1. Chinese (Advisor: Ms. Zhang Qiujuan)
2. French (Advisor: Mr. Bruno Mahon)
3. German (Advisor: Mr. Thomas Krey)
4. Japanese (Advisor: Ms. Orié Green)
5. Thai (Advisor: Ms. Arpaporn Iemubol)
6. Spanish (Advisor: Mr. Javier Fernandez)

| CHINESE |

Students in other majors who wish to take a minor in Chinese must complete the courses listed below.

Prerequisites

ICML	131	Elementary Chinese I	4 (4-0-8)
ICML	132	Elementary Chinese II	4 (4-0-8)
ICML	133	Elementary Chinese III (taken as a free elective)	4 (4-0-8)

Required Courses

			32 credits
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	320	Intermediate Chinese: Oral Skills A	4 (4-0-8)
ICLC	330	Intermediate Chinese: Written Skill A	4 (4-0-8)

| FRENCH |

Students in other majors who wish to take a minor in French must complete the courses listed below.

Prerequisites

ICML	121	Elementary French I	4 (4-0-8)
ICML	122	Elementary French II	4 (4-0-8)
ICML	123	Elementary French III (taken as a free elective)	4 (4-0-8)

Required Courses			32 credits
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	320	Intermediate French: Oral Skills A	4 (4-0-8)
ICLF	330	Intermediate French: Written Skill A	4 (4-0-8)

| GERMAN |

Students in other majors who wish to take a minor in German must complete the courses listed below.

Prerequisites

ICML	101	Elementary German I	4 (4-0-8)
ICML	102	Elementary German II	4 (4-0-8)
ICML	103	Elementary German III (taken as a free elective)	4 (4-0-8)

Required Courses			32 credits
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	320	Intermediate German: Oral Skills A	4 (4-0-8)
ICLG	330	Intermediate German: Written Skill A	4 (4-0-8)

| JAPANESE |

Students in other majors who wish to take a minor in Japanese must complete the courses listed below.

Prerequisites

ICML	111	Elementary Japanese I	4 (4-0-8)
ICML	112	Elementary Japanese II	4 (4-0-8)
ICML	113	Elementary Japanese III (taken as a free elective)	4 (4-0-8)

Required Courses			32 credits
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	320	Intermediate Japanese: Oral Skills A	4 (4-0-8)
ICLJ	330	Intermediate Japanese: Written Skill A	4 (4-0-8)

| THAI |

Students in other majors who wish to take a minor in Thai must complete the courses listed below.

Prerequisites

ICML	161	Elementary Thai I	4 (4-0-8)
ICML	162	Elementary Thai II	4 (4-0-8)
ICML	163	Elementary Thai III (taken as a free elective)	4 (4-0-8)

Required Courses

32 credits

ICLT	211	Pre-intermediate Thai I	4 (4-0-8)
ICLT	212	Pre-intermediate Thai II	4 (4-0-8)
ICLT	213	Pre-intermediate Thai III	4 (4-0-8)
ICLT	311	Intermediate Thai I	4 (4-0-8)
ICLT	312	Intermediate Thai II	4 (4-0-8)
ICLT	313	Intermediate Thai III	4 (4-0-8)
ICLT	320	Intermediate Thai: Oral Skills A	4 (4-0-8)
ICLT	330	Intermediate Thai: Written Skill A	4 (4-0-8)

| SPANISH |

Students in other majors who wish to take a minor in Spanish must complete the courses listed below.

Prerequisites

ICML	141	Elementary Spanish I	4 (4-0-8)
ICML	142	Elementary Spanish II	4 (4-0-8)
ICML	143	Elementary Spanish III (taken as free elective)	4 (4-0-8)

Required Courses

32 credits

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	320	Intermediate Spanish: Oral Skills A	4 (4-0-8)
ICLS	330	Intermediate Spanish: Written Skill A	4 (4-0-8)

| HUMANITIES Certificate |

The German Philosopher Immanuel Kant wrote: All the interests of my reason, speculative as well as practical, combine in the three following questions: 1. What can I know? 2. What ought I to do? 3. What may I hope? Written more than 200 years ago, these questions still challenge contemporary philosophy.

Being able to discuss the fundamental questions of life is more than an academic skill. A comprehensive understanding of philosophy and its different forms of argumentation allows for a meaningful and responsible connection to the world—be it when we have to make difficult decisions, in conversations with others, in (academic) reading, or in aesthetic experience. Philosophy broadens our horizon, opens up new perspectives and sharpens our mind both analytically and creatively. Studying philosophy is rewarding in itself; a certified philosophy minor, however, will definitely prove an additional asset for students who aim to continue in a postgraduate program or attempt to enter a difficult job market that increasingly demands intellectual flexibility and independence, analytical thinking and a sense for the ethical dimension of life.

Students wishing to pursue a deeper understanding of a specific area of the humanities can pursue either a certificate or a minor.

There are four Humanities certificate options, each one focusing on a specific thematic area: (A) Philosophy, (B) Reasoning & Analysis, (C) Ethics, and (D) Aesthetics. To earn a certificate, students must take a total of four courses (16 credits) in a specific area. These courses are in addition to a student's normal General Education requirement in the Humanities.

Students can also choose to go further and earn a minor in 'Philosophical Reasoning' by completing any one of the certificate plans, plus any four additional courses from any of the other certificate plans, for a total of eight courses (32 credits) beyond the student's normal Humanities General Education requirement.

| PHILOSOPHY |

Compulsory Course

ICHM101	Introduction to Philosophy	4 (4-0-8)
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Elective Courses (must take three)

ICHM106	Moral and Ethical Studies	4 (4-0-8)
ICHM107	Asian Philosophy	4 (4-0-8)
ICHM212	Enlightenment in European Literature	4 (4-0-8)
ICHM225	Western Classical Ideal	4 (4-0-8)
ICSO303	Modern Social Theory	4 (4-0-8)

| REASONING & ANALYSIS |**Compulsory Course**

ICHM103	Introduction to Logic	4 (4-0-8)
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Elective Courses (must take three)

ICHM203	Intermediate Logic	4 (4-0-8)
ICHM213	Elements of Knowledge Representation	4 (4-0-8)
ICNS171	The Scientific Approach to Society	4 (4-0-8)

| ETHICS |**Compulsory Course**

ICHM106	Moral and Ethical Studies	4 (4-0-8)
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Elective Courses (must take three)

ICHM107	Asian Philosophy	4 (4-0-8)
ICHM205	Politics and Ethics	4 (4-0-8)
ICHM206	Ethics and Technology	4 (4-0-8)
ICSO332	Human Rights	4 (4-0-8)
ICSO378	International Law and the State	4 (4-0-8)

| AESTHETICS |**Compulsory Course**

ICHM140	Introduction to Art Theory	4 (4-0-8)
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Elective Courses (must take three)

ICHM105	Music Appreciation	4 (4-0-8)
ICHM141	Art Appreciation I	4 (4-0-8)
ICHM142	Art Appreciation II	4 (4-0-8)
ICHM218	Film Studies	4 (4-0-8)
ICHM223	Thai Arts I	4 (4-0-8)

| ENTERTAINMENT MEDIA PRODUCTION MINOR |

Students who are interested in having a minor in Entertainment Media Production (EM) must complete a minimum of 32 credits, 16 of which are from the required courses, and the remaining 16 credits are from the major elective courses.

Required Course			16 credits
ICEM	101	Media Production	4 (4-0-8)
ICEM	104	Visual Communication I	4 (4-0-8)
ICEM	105	Visual Communication II	4 (4-0-8)
ICEM	202	Storytelling	4 (4-0-8)

Elective Courses			16 credits
ICAM	101	Introduction to Animation	4 (4-0-8)
ICAM	102	Color Theory and Application	4 (4-0-8)
ICAM	103	Drawing for Animation I	4 (0-8-4)
ICAM	201	Character Design I	4 (0-8-4)
ICFM	101	Film Production	4 (0-8-4)
ICFM	102	Introduction to Film	4 (4-0-8)
ICFM	201	Cinematography	4 (0-8-4)
ICFM	203	Scriptwriting for Film	4 (4-0-8)
ICFM	204	Film Post Production I	4 (0-8-4)
ICFM	251	Music Video Production	4 (0-8-4)
ICFM	301	Acting for Film	4 (0-8-4)
ICFM	402	Film Producing	4 (0-8-4)
ICTV	101	TV Production Techniques	4 (0-8-4)
ICTV	102	Multi-Camera Production	4 (0-8-4)
ICTV	201	TV Production Design	4 (0-8-4)
ICTV	202	TV On-Location Production	4 (0-8-4)
ICTV	353	Make-up for TV and Film	4 (4-0-8)
ICTV	355	Special Effects Make-up for TV and Film	4 (4-0-8)

| SOCIAL SCIENCE MINORS |

Purpose

The Social Science Minors are designed to enable students to make a short intensive study of a particular subject area in addition to their chosen major. To complete a Social Science Minor, a student must complete a total of eight agreed higher level Social Science courses in addition to the courses which they study for their General Education, free electives and subject major.

Minors and available courses

A total of four Social Science minors are currently available. Students who are not studying for a Social Science Major may take any of the four minors; students who are majoring in Social Science are allowed to apply for minors which are not in the area of their concentration. The minors are as follows:

1. International Studies
2. Modern World History
3. Southeast Asian Studies
4. Psychology

Student information

MUIC students who wish to take one of the minors in Social Science must complete eight of the listed courses in addition to their subject major and their General Education requirement. Permission of both the Coordinator of the particular Social Science Minor and the Program Director of the student's own major is required before any student undertakes a minor.

Interested students should contact the appropriate Social Science Coordinator for information about a particular minor.

A student who wishes to take a Social Science Minor must register twice, once each with the Social Science program and with the Office for Academic Services. The Social Science Administrative Coordinator will supply details and an application/ registration form on request.

Notes:

1. It is not possible to count any course for both General Education and a Social Science minor.
2. Before being accepted to study a Social Science Minor, students must have both a GPA close to 3.0 or higher (GPA of 2.75 as minimum requirement) and proven English competence.
3. Students who have taken any of the specialist Social Science courses for a particular minor as General Education courses should consult the Coordinator for details of alternative courses they may take.

Course requirements

The course requirements for each minor are listed below. Substitutions for certain courses may be allowed after consultation with the responsible Minor Coordinator, and with the formal approval of the Social Science Division Executive Committee. Details of course availability must be checked with the responsible Minor Coordinator.

| INTERNATIONAL STUDIES |

Required Courses			12 credits
ICSO	202	Major Social Institutions	4 (4-0-8)
ICSO	203	Global Change in the Late Twentieth Century	4 (4-0-8)
ICSO	207	The History of the World Economy	4 (4-0-8)
Elective Courses (choose 5 courses)			20 credits
ICSO	261	Economic Geography	4 (4-0-8)
ICSO	262	Global Resources	4 (4-0-8)
ICSO	263	Population and Migration in the Modern World	4 (4-0-8)
ICSO	264	The World Economy Since 1945	4 (4-0-8)
ICSO	271	International Relations	4 (4-0-8)
ICSO	272	Comparative Political Systems	4 (4-0-8)
ICSO	273	World Politics and World Order	4 (4-0-8)
ICSO	274	International Organizations	4 (4-0-8)
ICSO	275	Democracy as a Political System	4 (4-0-8)

ICSO	276	History of War	4 (4-0-8)
ICSO	280	Gender Issues in the Modern World	4 (4-0-8)
ICSO	282	The Global Media and Social Change	4 (4-0-8)
ICSO	285	Drugs and Society	4 (4-0-8)
ICSO	332	Human Rights	4 (4-0-8)
ICSO	360	Patterns and Consequences of Development	4 (4-0-8)
ICSO	364	Slavery and Human Trafficking	4 (4-0-8)
ICSO	365	Genocide and Ethnic Cleansing	4 (4-0-8)
ICSO	366	Indigenous Cultures in the Modern World	4 (4-0-8)
ICSO	367	Environmental Issues in Social Context	4 (4-0-8)
ICSO	369	NGOs and Political and Business Contexts	4 (4-0-8)
ICSO	370	Diplomacy and Negotiation	4 (4-0-8)
ICSO	371	Foreign Policy of the Major Powers Since 1945	4 (4-0-8)
ICSO	374	Revolution, Terrorism and the Modern State	4 (4-0-8)
ICSO	378	International Law and the State	4 (4-0-8)
ICSO	381	Ethnicity, Society and the State	4 (4-0-8)
ICSO	382	Religion, Society and the State	4 (4-0-8)
ICSO	383	International Crime and Law Enforcement	4 (4-0-8)
ICSO	384	Migration, Diasporas, and Culture	4 (4-0-8)
ICSO	390	Tourism, Development and Cultural Change	4 (4-0-8)
ICSO	401	Independent Study in the Social Sciences*	4 (4-0-8)

*Note: The Independent Study must be an International Studies topic chosen in consultation with the Concentration Advisor.

| MODERN WORLD HISTORY |

Required Courses			20 credits
ICSO	210	World History A (c. 1400-c. 1763)	4 (4-0-8)
ICSO	211	World History B (c. 1763-c. 1914)	4 (4-0-8)
ICSO	212	World History C (c. 1914-c. 1945)	4 (4-0-8)
ICSO	213	World History D (c. 1945-c. 2000)	4 (4-0-8)
ICSO	302	Historiography	4 (4-0-8)
Elective Courses (choose 3 courses)			12 credits
ICSO	203	Global Change in the Late Twentieth Century	4 (4-0-8)
ICSO	207	The History of the World Economy	4 (4-0-8)
ICSO	231	Modern History of East Asia	4 (4-0-8)
ICSO	232	Civilizations of East Asia	4 (4-0-8)
ICSO	234	The Indian Sub-Continent up to c. 1500	4 (4-0-8)
ICSO	235	The Indian Sub-Continent since c. 1500	4 (4-0-8)
ICSO	237	Australasia Since 1770	4 (4-0-8)
ICSO	238	Africa Since 1800	4 (4-0-8)
ICSO	239	The Middle East Since 1800	4 (4-0-8)

ICSO	241	Latin America Since 1800	4 (4-0-8)
ICSO	243	North America, c. 1763-1900	4 (4-0-8)
ICSO	244	The United States and Canada Since 1900	4 (4-0-8)
ICSO	245	European Society and Culture up to 1900	4 (4-0-8)
ICSO	246	Europe Since 1945	4 (4-0-8)
ICSO	247	The European Union: Development, Institutions, and Politics	4 (4-0-8)
ICSO	248	Russia and the Soviet Union Since 1800	4 (4-0-8)
ICSO	250	The European Classical Heritage	4 (4-0-8)
ICSO	251	Medieval and Renaissance Europe	4 (4-0-8)
ICSO	252	Early Modern Europe, c. 1450-c. 1700	4 (4-0-8)
ICSO	253	The European Ancien Regime and Revolution, c. 1700-c. 1830	4 (4-0-8)
ICSO	254	European Society and Culture, c. 1830-c. 1945	4 (4-0-8)
ICSO	264	The World Economy Since 1945	4 (4-0-8)
ICSO	276	History of War	4 (4-0-8)
ICSO	281	The Social Impact of Science and Technology in The Modern World	4 (4-0-8)
ICSO	284	History of Disease and Medical	4 (4-0-8)
ICSO	341	Society, Politics and Economics in Contemporary East Asia	4 (4-0-8)
ICSO	342	Society, Politics and Economics in Contemporary South Asia	4 (4-0-8)
ICSO	343	Society, Politics and Economics in Contemporary Australasia	4 (4-0-8)
ICSO	344	Society, Politics and Economics in Contemporary Africa	4 (4-0-8)
ICSO	345	Society, Politics and Economics in the Contemporary Middle East	4 (4-0-8)
ICSO	346	Society, Politics and Economics in Contemporary Latin America and the Caribbean	4 (4-0-8)
ICSO	347	Society, Politics and Economics in Contemporary North America	4 (4-0-8)
ICSO	348	Society, Politics and Economics in Contemporary Europe	4 (4-0-8)
ICSO	349	Society, Politics and Economics in Contemporary Russia and the Former Soviet Republics	4 (4-0-8)
ICSO	355	Religion in the Americas	4 (4-0-8)
ICSO	371	Foreign Policy of the Major Powers Since 1945	4 (4-0-8)
ICHM	217	The European Enlightenment	4 (4-0-8)
ICSO	401	Independent Study in the Social Sciences*	4 (4-0-8)

*Note: The Independent Study must be a History topic chosen in consultation with the Concentration Advisor.

| SOUTHEAST ASIAN STUDIES |

Required Courses			16 credits
ICSA	201	Geography of Southeast Asia	4 (4-0-8)
ICSA	203	The History of Southeast Asia up to 1800	4 (4-0-8)
ICSA	204	Modern History of Southeast Asia, c. 1800-Present	4 (4-0-8)
ICSA	206	Political Systems of Southeast Asia	4 (4-0-8)

Elective Courses (choose 4 courses)			16 credits
ICSA	202	Ecology of Southeast Asia	4 (4-0-8)
ICSA	211	Economics of Southeast Asia	4 (4-0-8)
ICSA	212	Peasant Societies in Southeast Asia	4 (4-0-8)
ICSA	213	Poverty and Rural Development in Southeast Asia	4 (4-0-8)
ICSA	214	Women in Southeast Asia	4 (4-0-8)
ICSA	253	Thai Society and Culture	4 (4-0-8)
ICSA	255	Thai Economic History	4 (4-0-8)
ICSA	311	International Politics in Southeast Asia	4 (4-0-8)
ICSA	312	Ethnicity and Nationalism in Southeast Asia	4 (4-0-8)
ICSA	314	Economic Problems in Southeast Asia	4 (4-0-8)
ICSA	321	Religion, Society and Politics in Mainland Southeast Asia	4 (4-0-8)
ICSA	322	Religion, Society and Politics in Maritime Southeast Asia	4 (4-0-8)
ICSO	401	Independent Study in the Social Sciences*	4 (4-0-8)

*Note: The Independent Study must be a Southeast Asian Studies topic chosen in consultation with the Concentration Advisor.

| PSYCHOLOGY |

Required Course			4 credits
ICSP	250	History and Systems of Psychology	4 (4-0-8)

Elective Courses (choose 7 courses)			28 credits
ICSP	251	Introduction to Developmental Psychology I	4 (4-0-8)
ICSP	252	Introduction to Developmental Psychology II	4 (4-0-8)
ICSP	253	Introduction to Social Psychology	4 (4-0-8)
ICSP	254	Theories of Personality	4 (4-0-8)
ICSP	255	Introduction to Abnormal Psychology	4 (4-0-8)
ICSP	256	Industrial and Organizational Psychology	4 (4-0-8)
ICSP	257	Educational Psychology	4 (4-0-8)
ICSP	258	Cross-Cultural Psychology	4 (4-0-8)
ICSO	301	Research Methods in the Social Sciences	4 (4-0-8)
ICSP	350	Evolutionary Psychology	4 (4-0-8)
ICSP	351	Introduction to the Freudian and Psychodynamic Traditions	4 (4-0-8)
ICSP	352	Prosocial and Antisocial Behaviour	4 (4-0-8)
ICSP	353	Clinical Psychology	4 (4-0-8)
ICSP	354	Psychological Testing	4 (4-0-8)
ICSP	355	Drug Use and Behaviour	4 (4-0-8)
ICSP	356	Psychology of Emotion	4 (4-0-8)
ICSP	357	Psychology of Motivation	4 (4-0-8)

RECOMMENDED PREPARATION

Students should have some background knowledge in Psychology, and will be required to complete extra reading if they have not already taken ICSS 112 (Introduction to Psychology) as part of their General Education requirement.

| TOURISM AND HOSPITALITY MANAGEMENT MINOR |

Students who are interested in having a minor in Tourism and Hospitality Management (THM) must complete a minimum of 32 credits, 16 of which are from the required courses, and the remaining 16 credits are from elective courses.

Required Courses			16 credits
ICTM	212	Introduction to Travel Industry	4 (4-0-8)
ICTM	311	Sales and Marketing for Travel Industry	4 (4-0-8)
ICTM	400	Tourism Business Management	4 (4-0-8)
ICTM	420	Sustainable Tourism Studies	4 (3-2-7)

Elective Courses			16 credits
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| Hospitality Management |

ICTM	210	Accounting for the Travel Industry	4 (4-0-8)
ICTM	213	Finance for Travel Industry	4 (4-0-8)
ICTM	310	Event Management	4 (3-2-7)
ICTM	312	Human Resources Management for Travel Industry	4 (4-0-8)
ICTM	320	Lodging Property Management	4 (4-0-8)
ICTM	323	Front Office Management	4 (4-0-8)
ICTM	324	Food and Beverage Management	4 (4-0-8)
ICTM	325	Housekeeping Management	4 (4-0-8)
ICTM	352	Tourism and Hospitality Law	4 (4-0-8)
ICTM	401	Strategic Management for Travel Industry	4 (4-0-8)
ICTM	475	Introduction to Culinary Arts	4 (3-2-7)

| Tourism Management |

ICTM	214	Economics of Tourism	4 (4-0-8)
ICTM	270	Consumer Behavior in Tourism	4 (4-0-8)
ICTM	313	The Tourism Environments	4 (3-2-7)
ICTM	319	Eco-tourism Studies	4 (3-2-7)
ICTM	330	Cultural Heritage Management	4 (4-0-8)
ICTM	341	Wilderness Tourism Management	4 (3-2-7)
ICTM	370	Technology for Tourism Industry	4 (4-0-8)
ICTM	352	Tourism and Hospitality Law	4 (4-0-8)
ICTM	428	Tourism Guide	4 (3-2-7)
ICTM	430	Managing Package Tourism	4 (4-0-8)
ICTM	472	Airline Business Management	4 (4-0-8)
ICTM	480	Tourism and Hospitality Research Methods	4 (4-0-8)

SCIENCE MINORS**For Science Majors****| MINOR IN APPLIED MATHEMATICS |**

Mathematics is the study of and search for patterns. As such, it plays a fundamental role in many fields. The ubiquitous application of statistical analysis in both commerce and science makes mathematics useful for almost anyone.

Course Requirements

Required Courses		20 credits
ICMA 211	General Mathematics I	4 (4-0-8)
	OR	
ICMA 215	Calculus	4 (4-0-8)
ICMA 212	General Mathematics II	4 (4-0-8)
ICMA 321	Linear Algebra	4 (4-0-8)
ICMA 322	Advanced Calculus	4 (4-0-8)
ICMA 242	Discrete Mathematics	4 (4-0-8)
	OR	
ICCS 324	Discrete Structures	4 (4-0-8)
Elective Courses		12 credits
ICMA 214	Ordinary Differential Equations	4 (4-0-8)
	OR	
ICCS 281	Advanced Mathematics for Computer Science	4 (4-0-8)
ICMA 323	Partial Differential Equations	4 (4-0-8)
ICMA 324	Real Analysis	4 (4-0-8)
ICMA 335	Complex Variables	4 (4-0-8)
ICMA 336	Numerical Methods	4(3-2-7)
	OR	
ICCS 306	Numerical Methods I	4 (4-0-8)

| MINOR IN BIOLOGICAL SCIENCE |

The study of life is of enormous relevance to everyone. Our existence is an amazing synergy of matter and energy. Before we are managers, secretaries, travel agents or CEO's, CFO's or CIO's, we are living organisms. There is no doubt that any human would find knowledge of biology useful throughout their lives.

For science majors, biology integrates much of what is learned in isolation in other disciplines. It applies what is taught theoretically. Life science applications of the physical and mathematical sciences are abundant and include mathematical modeling for epidemiology, development of miniaturized (and eventually nano-scale) non-invasive medical technology, and pharmaceutical research and development.

Course Requirements

Required Courses		20 credits
ICBI 211	General Microbiology	4 (3-2-7)
ICBI 212	General Biochemistry	4 (3-2-7)
ICBI 213	Genetics	4 (4-0-8)
ICBI 216	Cell Biology	4 (4-0-8)
ICBI 241	Ecology and Conservation	4 (3-2-7)

Elective Courses		12 credits
ICBI 102	Integrated Laboratory in Biological Science I	2 (0-4-2)
ICBI 221	Animal Biology	4 (3-2-7)
ICBI 231	Plant Biology	4 (3-2-7)
ICBI 314	Tropical Ecology	4 (3-2-7)
ICBI 317	Aquatic Ecology	4 (4-0-8)
ICBI 344	Environmental Science	4 (4-0-8)
ICBI 415	Biotechnology	4 (4-0-8)
ICBI 441	Marine Biology	4 (3-2-7)
ICBI 464	Cell Technology	4 (3-2-7)

| MINOR IN CHEMISTRY |

The Chemistry minor teaches understanding of the elements, their reactivity and their interactions. It complements studies in Biology, Biomedical Science, Environment and Food Science and would be valuable for business managers in most industries.

Course Requirements

Required Courses		24 credits
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)
	OR	
ICCH 220	Basic Organic Chemistry	4 (3-2-7)
ICCH 222	Organic Chemistry II	4 (4-0-8)
ICCH 311	Analytical Chemistry I	4 (3-2-7)
ICCH 441	Inorganic Chemistry I	4 (4-0-8)

Elective Courses		8 credits
ICCH 321	Organic Spectroscopy	4 (4-0-8)
ICCH 421	Physical Organic Chemistry	4 (4-0-8)
ICCH 423	Heterocyclic Chemistry	4 (4-0-8)
ICCH 424	Natural Product Chemistry	4 (4-0-8)

| MINOR IN COMPUTER SCIENCE |

The study of Computer Science can be applied to every job function. The minor in Computer Science teaches a broad understanding of computer methodology. It is open to all majors and with the ubiquity of computer-based research and analysis, forms a complement for studies in all fields.

Course Requirements

Required Courses		20 credits
ICCS 201	Computer Programming I	4 (3-2-7)
ICCS 321	Data Structures and Algorithm Analysis	4 (4-0-8)
ICCS 323	Computer Data Communication	4 (4-0-8)
ICCS 365	Information System Analysis and Design	4 (4-0-8)
ICCS 411	Database Management Systems	4 (4-0-8)

Elective Courses		12 credits
ICCS 315	Operating Systems	4(4-0-8)
ICCS 366	Management Information System	4 (4-0-8)
ICCS 415	Computer Graphic	4 (3-2-7)
ICCS 428	Object - Oriented Concepts	4(4-0-8)
ICCS 431	Software Design Development	4 (4-0-8)
ICCS 434	Computer Security	4 (4-0-8)
ICCS 451	Artificial Intelligence	4 (4-0-8)
ICCS 474	Internet Programming	4 (3-2-7)
ICCS 477	System Simulation	4 (4-0-8)
ICCS 479	Electronic Commerce	4 (4-0-8)

| MINOR IN ENVIRONMENTAL SCIENCE |

As nations develop they move from economies based on natural resources to ones based on information. The value of healthy ecosystems becomes better appreciated, and governments respond to this public interest with toughening environmental regulations such as ISO 14001. Industrial, business and governmental executives should have a working knowledge of environmental science. This minor can be tailored to suit student's interests.

Course Requirements

Required Courses		16 credits
ICNS 111	Fundamental Biology	4 (4-0-8)
	OR	
ICNS 112	Principles of Biology	4(4-0-8)
	OR	
ICNS 112	Integrated Biology	4 (4-0-8)
ICNS 153	Ecosystems and Natural Resources	4 (3-2-7)
	OR	
ICBI 241	Ecology and Conservation	4(3-2-7)
ICEN 391	Sustainable Development	4 (4-0-8)
ICNS 257	Environmental Issues: Past, Present and Future	4 (4-0-8)

Elective Courses			16 credits
ICBI	255	Introduction to Oceanography	4 (3-2-7)
ICBI	344	Environmental Science	4 (4-0-8)
ICBI	441	Marine Biology	4 (3-2-7)
ICEN	241	Environmental Pollution I	4 (4-0-8)
ICEN	313	Clean Technology and Waste Utilization	4(4-0-8)
ICEN	314	Tropical Ecology	4 (3-2-7)
ICEN	317	Aquatic Ecology	4 (3-2-7)
ICEN	318	Aquatic Ecology Field Course	4 (0-8-4)
ICEN	320	Population and Community Ecology	4 (3-2-7)
ICEN	331	Soil, Land Use and Degradation	4 (4-0-8)
ICEN	352	Environmental and Resource Economics	4 (4-0-8)
ICEN	362	Natural Resource Conservation and Management	4 (4-0-8)
ICEN	431	Land Use and Urban Environmental Planning	4 (4-0-8)
ICEN	441	Occupational Health and Safety	4 (4-0-8)
ICEN	461	Energy Conservation and Development	4 (4-0-8)
ICEN	462	Coastal and Marine Resources	4 (4-0-8)
ICEN	464	Water Resources Management	4 (4-0-8)

Other ICEN or ICBI courses may be substituted for the Minor Electives with approval of the minor program director. Students are recommended to concentrate their elective in related areas such as the marine or terrestrial environments, or management.

| MINOR IN FOOD SCIENCE AND TECHNOLOGY |

Students in this program learn the principles of modern food processing and preservation. Direct applications abound in the multibillion-dollar food industry.

Course Requirements

Required Courses			16 credits
ICFS	312	Food Chemistry I	4 (3-2-7)
ICFS	313	Food Chemistry II	4 (3-2-7)
ICFS	315	Food Processing I	4 (3-2-7)
ICFS	316	Food Processing II	4 (3-2-7)

Elective Courses			16 credits
ICFS	322	Fruits and Vegetables Technology	4 (4-0-8)
ICFS	323	Marine and Freshwater Products	4 (4-0-8)
ICFS	325	Dairy Products Technology	4 (4-0-8)
ICFS	371	Food Product Development	4 (4-0-8)
ICFS	423	Beverage Technology	4 (4-0-8)
ICFS	424	Fat and Oil Technology	4 (4-0-8)
ICFS	425	Cereal Science and Technology	4 (3-2-7)

Other ICFS courses may be substituted for Minor Electives with approval of the Food Science and Technology Program Director.

| MINOR IN PHYSICS |

A Physics minor leads to deeper understanding of the fundamental mechanisms that govern reality. It is useful for engineering and is an excellent complement for chemistry; biosciences students interested in physiology, physical therapy, and medical technology will also benefit.

Course Requirements

Required Courses			24 credits
ICSC 303	Statistics		4 (4-0-8)
ICMA 211	General Mathematics I		4 (4-0-8)
ICMA 215	Calculus		4 (4-0-8)
ICMA 212	General Mathematics II		4 (4-0-8)
ICPY 132	Principles of Physics		4 (4-0-8)
ICPY 211	General Physics I		4 (4-0-8)
ICPY 212	General Physics II		4 (4-0-8)

Elective Courses			8 credits
ICPY 321	Intermediate Mechanics		4 (4-0-8)
ICPY 322	Electricity and Magnetism		4 (4-0-8)
ICPY 323	Electrodynamics		4 (4-0-8)

For Non-Science Majors**| MINOR IN APPLIED MATHEMATICS |**

Required Courses			24 credits
ICNA 102	Principles of Mathematics		4 (4-0-8)
ICNS 111	Fundamental Biology		4 (4-0-8)
ICNS 121	Fundamental Chemistry		4 (4-0-8)
ICNS 131	Fundamental Physics		4 (4-0-8)
ICMA 211	General Mathematics I		4 (4-0-8)
	OR		
ICMA 215	Calculus		4 (4-0-8)
ICMA 212	General Mathematics II		4(4-0-8)

Elective Courses			8 credits
ICMA 214	Ordinary Differential Equations		4 (4-0-8)
ICMA 321	Linear Algebra *		4 (4-0-8)
ICMA 323	Partial Differential Equations		4 (4-0-8)

* Strongly recommended

| MINOR IN BIOLOGICAL SCIENCE |

Required Courses			20 credits
ICNS 103	Fundamental Mathematics		4 (4-0-8)

ICNS 112	Principles of Biology OR	4(4-0-8)
ICNS 112	Integrated Biology	4 (4-0-8)
ICNS 121	Fundamental Chemistry	4 (4-0-8)
ICNS 131	Fundamental Physics	4 (4-0-8)
ICBI 102	Integrated Laboratory in Biological Sciences I	2 (0-4-2)

Elective Courses **12 credits**

ICBI 211	General Microbiology	4 (3-2-7)
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 241	Ecology and Conservation	4 (3-2-7)
ICBI 256	Sustainable Development	4 (4-0-8)
ICBI 257	Environmental Issues: Past, Present and Future	4 (4-0-8)
ICBI 304	Basic Immunology	2 (2-0-4)
ICBI 308	Molecular Biology	4 (4-0-8)
ICSC 302	Scientific Research and Presentations	4 (4-0-8)

| MINOR IN CHEMISTRY |

Required Courses **28 credits**

ICNS 103	Fundamental Mathematics	4 (4-0-8)
ICNS 111	Fundamental Biology	4 (4-0-8)
ICNS 121	Principles of Chemistry	4 (4-0-8)
ICNS 131	Fundamental Physics	4 (4-0-8)
ICCH 111	General Chemistry	4 (3-2-7)
ICCH 220	Basic Organic Chemistry	4 (3-2-7)
ICCH 311	Analytical Chemistry I	4 (3-2-7)

Elective Courses **4 credits**

ICCH 444	Environmental Chemistry	4 (3-2-7)
ICCH 452	Polymer Science and Technology	4 (4-0-8)

| MINOR IN ENVIRONMENTAL SCIENCE |

Required Courses **28 credits**

ICNS 103	Fundamental Mathematics	4 (4-0-8)
ICNS 112	Principles of Biology	4 (4-0-8)
ICNS 121	Fundamental Chemistry	4 (4-0-8)
ICNS 131	Fundamental Physics	4 (4-0-8)
ICEN 311	Environmental Analysis Laboratory	4 (2-4-8)
ICEN 362	Natural Resource Conservation and Management	4 (4-0-8)
ICEN 391	Sustainable Development	4 (4-0-8)

Elective Courses		4 credits
ICEN 466	Environmental Management Systems	4 (4-0-8)
ICEN 468	Environmental Management Policy	4 (4-0-8)

| MINOR IN FOOD SCIENCE AND TECHNOLOGY |

Required Courses		28 credits
ICNS 103	Fundamental Mathematics	4 (4-0-8)
ICNS 112	Principles of Biology	4(4-0-8)
	OR	
ICNS 112	Integrated Biology	4 (4-0-8)
ICNS 121	Fundamental Chemistry	4 (4-0-8)
ICNS 131	Fundamental Physics	4 (4-0-8)
ICNS 211	The Science of Food	4 (4-0-8)
ICFS 315	Food Processing I	4 (3-2-7)
ICFS 316	Food Processing II	4 (3-2-7)

Elective Courses		4 credits
ICFS 331	Food Hygiene and Sanitation	4 (4-0-8)
ICFS 431	Food Microbiology	4 (3-2-7)

| MINOR IN PHYSICS |

Required Courses		24 credits
ICNS 103	Fundamental Mathematics	4 (4-0-8)
ICNS 111	Fundamental Biology	4 (4-0-8)
ICNS 121	Fundamental Chemistry	4 (4-0-8)
ICNS 131	Principles of Physics	4 (4-0-8)
ICPY 211	General Physics I	4 (4-0-8)
ICPY 212	General Physics II	4 (4-0-8)

Elective Courses		8 credits
ICPY 321	Intermediate Mechanics	4 (4-0-8)
ICPY 322	Electricity and Magnetism	4 (4-0-8)
ICPY 323	Electrodynamics	4 (4-0-8)

| MINOR IN COMPUTER SCIENCE |

Required Courses		24 credits
ICMA 102	Principles of Mathematics or equivalent (ICNS 101 and ICNS 103)	4 (4-0-8)
ICSC 303	Statistics	4 (4-0-8)
ICNS 141	Computer Essentials	4 (3-2-7)
ICCS 201	Computer Programming I	4 (3-2-7)
ICCS 321	Data Structures and Algorithm Analysis	4 (4-0-8)

ICCS 323	Computer Data Communication	4 (4-0-8)
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Elective Courses		8 credits
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ICCS 315	Operating Systems	4 (4-0-8)
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ICCS 366	Management Information System	4 (4-0-8)
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ICCS 365	Information System Analysis and Design *	4 (4-0-8)
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ICCS 411	Database Management Systems *	4(3-2-7)
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* Strongly recommended

| MINOR IN INTEGRATED SCIENCE |

Required Courses		24 credits
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ICNS 103	Fundamental Mathematics	4 (4-0-8)
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ICNS 111	Fundamental Biology	4 (4-0-8)
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ICNS 121	Fundamental Chemistry	4 (4-0-8)
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ICNS 131	Fundamental Physics	4 (4-0-8)
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- Choose one from Ecology Cluster

ICNS 152	Southeast Asian Ecology	4(4-0-8)
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ICNS 153	Ecosystems and Natural Resources	4 (3-2-7)
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- Choose one from Environmental Science Cluster

ICNS 253	Environmental Science	4 (4-0-8)
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ICNS 256	Sustainable Development	4 (4-0-8)
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ICNS 257	Environmental Issues: Past, Present and Future	4 (4-0-8)
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Elective Courses		8 credits
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ICNS 211	The Science of Food	4 (4-0-8)
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ICNS 252	Marine Biology	4 (3-2-7)
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ICNS 254	Pollution Biology	4 (3-2-7)
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N.B. Elective Substitutions: If students meet the prerequisites or have permission of the instructor any other science major course, except in **Mathematics and Computer Science**, may be substituted for the two electives.

The substitutions must be approved by the Integrated Science Minor Coordinator.

COURSE DESCRIPTIONS

| COURSE CODE |

ICAM	Animation Production
ICMA	Applied Mathematics
ICBI	Biological Science
ICMB	Business Administration
ICBE	Business Economics
ICCH	Chemistry
ICLC	Chinese
ICCD	Communication Design
EGIC	Computer Engineering
ICCS	Computer Science
ICCM	English Communication
ICEG	English Studies
ICEM	Entertainment Media Program
ICEN	Environmental Science
ICFM	Film Production
ICMF	Finance
ICFS	Food Science and Technology
ICLF	French
ICLG	German
ICHE	Health Education

ICHM	Humanities
ICIS	Information System
ICMI	International Business
ICSO	International Studies
ICLJ	Japanese
ICMK	Marketing
ICML	Modern Languages
ICNS	Natural Science
NSNS	Nursing Science
ICPE	Physical Education
ICPY	Physics
ICSP	Psychology
ICSC	Science
ICSS	Social Science
ICSA	Southeast Asian Studies
ICLS	Spanish
ICTV	Television Production
ICLT	Thai
ICTM	Travel Industry Management

|ANIMATION PRODUCTION|

ICAM 101	Introduction to Animation Prerequisite: ICEM 101	4 (1-6-5)
	General theories of animation as art and entertainment; history of animation; changes in attitudes towards animation; overview of the state of the art, technology, and business of animation; key concepts of visual language and composition.	
ICAM 102	Color Theory and Application	4 (1-6-5)
	Historical evolution of color theory; theories of color; basic color terminology; abstract and representational color, harmony and color relationships, color schemes. Color applied to storytelling: color for characters, sequences and scenes, emotional use of color, and narrative use of color.	
ICAM 103	Drawing for Animation I	4 (0-8-4)
	Introduction to technical drawing for 2D and 3D animation; animation fundamentals including posing, staging, caricature, and exaggeration. Study and creation of cartoon drawings; study of realistic drawings; studio practice in life drawing studio; drawing from a human model.	
ICAM 104	2D Animation I Prerequisite: ICAM 101	4 (0-8-4)
	Basic principles of animation including posing, timing, squash and stretch, anticipation, slow in and out, follow through. Studio practice includes a series of hand-drawn exercises.	
ICAM 201	Character Design I Prerequisite: ICAM 103	4 (1-6-5)
	Creation of animation-friendly 2D and 3D characters for the screen, emphasizing the look and appeal of a character, personality, psychology, context within an environment and within a cast of supporting characters.	
ICAM 202	Drawing for Animation II Prerequisite: ICAM 103	4 (0-8-4)
	Deeper exploration of the human muscular and skeletal structure; volumetric drawing from a model, realistic drawing, light, value, techniques for making the 2D drawing look more 3-dimensional.	
ICAM 203	Storyboarding I	4 (1-6-5)
	Introduction to the development of a storyboard; combination of cinematic storytelling skills with drawing, acting, pacing, etc. Practice is based on the application of film language and narrative devices and structures, careful study of scripts and of animated and live action films; drawing and staging exercises.	

ICAM 204	2D Animation II Prerequisite: ICAM 104 Acting, dialogue, and perspective; exploration of the 2D animation process: rough, breakdown, and clean-up.	4 (0-8-4)
ICAM 205	Computer Programs for Animation Prerequisites: ICAM 202, ICAM 204 Introduction to computer programs essential to the pre-production and production process; technical and artistic use of computer programs as a tool for creating art; specific use of each program in an integrated computer graphics production facility.	4 (0-8-4)
ICAM 206	Storyboarding II Prerequisite: ICAM 203 In-depth exploration of storyboarding: characterization, points of view, guidance of the eye through the sequence of the storyboard, and montage sequences. From storyboard to story reel: integrating sound and editing techniques. Special focus on story reels and storyboards for a TV series.	4 (0-8-4)
ICAM 301	Layout Design I Prerequisite: ICAM 206 Creating the space for animated characters to act in; visual storytelling, introduction to perspective; creating the illusion of 3D space, incorporating perspective into the design of all manner of environments. Basic design principles utilized to guide the eye of the audience around the static and moving picture: basic lighting concepts, using value to direct the eye.	4 (0-8-4)
ICAM 302	3D Animation I Prerequisite: ICAM 204 Foundation skills for 3D computer animation; developing a working knowledge of the underlying process of 3D animation; polygonal modeling techniques, NURBS, procedural and raster image mapping, lighting, camera, shader and rendering methods, hierarchical linking, "keyframe animation", and pre-production fundamentals.	4 (0-8-4)
ICAM 303	3D Animation II Prerequisite: ICAM 302 Expansion of 3D computer animation; developing a working knowledge of the advanced process of 3D animation; complex polygonal modeling techniques, NURBS, procedural and raster image mapping, lighting, camera, shader and rendering methods, hierarchical linking, keyframe animation, and dynamic simulation	4 (0-8-4)

ICAM 304	Character Design II Prerequisite: ICAM 201 Creation and development of complex and multi-faceted 2D and 3D characters, emphasizing facial expressions; study and practice of a variety of animation design styles; 3D sculpting using Maya and Zbrush.	4 (0-8-4)
ICAM 351	Animation Production Management Aspects of managing a production: economics of the animation business; supply and demand of the global animation industry; production process and pipeline from development to postproduction.	4 (4-0-8)
ICAM 352	Layout Design II Prerequisite: ICAM 301 Building on the foundations of Layout Design I; in-depth practice in creating and staging of the environments in which characters act; implementation of film language principles using Maya tools; color and stylization. 2D, 3D, and live action filmmaking will be discussed.	4 (0-8-4)
ICAM 353	Painting I Watercolor and acrylic painting: introduction to color composition, color mixing, wet and dry techniques, light and value, and texture. Painting from still-life and outdoor landscapes.	4 (0-8-4)
ICAM 354	Painting II Prerequisite: ICAM 353 Introduction to computer programs used by professional 2D and 3D animation studios: Photoshop, Painter, and Body Paint; using various combinations of programs for visual paint effects, pre-production and production uses of each program.	4 (0-8-4)
ICAM 355	Computer and Video Games Introduction to game theory and practice; principal, technical and process of video game creation; ethical and marketing factors. Educational theory to adjust level of game design and activities to the intended user.	4 (4-0-8)
ICAM 356	Media Compositing Introduction to technical and principles of media compositing; conceptualizing many layers of visual material to create a complete picture; visualization of and combination of live action and computer generated pictures, not in real time during the shooting process; the marriage of multiple sources of visual material, each obtained at differing times in the production process.	4 (2-4-6)

ICAM 370	Seminar in Animation Production Prerequisite: Third year or higher The course examines and finds solutions to chosen current issues or case studies in Animation Production. Students are required to participate in supervised discussions supported by experienced lecturers.	2 (2-0-4)
ICAM 380	Selected Topics in Animation Production Prerequisite: Third year or higher Selected topics in animation including specific animation schools and styles, animators, character walks, 3 D game design, various topics in Maya, Photoshop, Premier, After Effects, or Flash, detailed investigation of new or emerging trends in animation, etc.; special subjects determined by student interest and available instructor or visiting faculty.	4 (0-8-4)
ICAM 381	Independent Study in Animation Production A directed independent study tailored to fit individual interests in a specific area of animation production.	4 (0-8-4)
ICAM 398	Professional Internship in Animation Production Supervised internship in the field through placement in local animation companies. At the end of the internship, a seminar will be conducted in order to summarize the main concepts in "Animation Production" within a context of Mass Communication.	4 (0-12-4)
ICAM 399	International Field Study in Animation Production Prerequisite: ICAM 303 Introduction to the management styles of international media corporations; international artistic and business trends, and international media markets; foreign regulations and legal considerations; innovations, and technology.	4 (0-12-4)
ICAM 498	Animation Production Final Project I Preparation of the models and story reel for a short 2 to 3 minute animated film using the medium of their choice. A faculty member will supervise the progression of the project over the course of the trimester.	4 (0-12-4)
ICAM 499	Animation Production Final Project II Prerequisite: ICAM 498 Completion of the short film prepared in Animation Final Project part I. A faculty member will supervise the progression of the project over the course of the trimester. Upon completion, all final projects will be presented together in a film festival/job fair setting.	8 (0-24-8)

| APPLIED MATHEMATICS |

ICMA 102	Principles of Mathematics A brief review of trigonometry; limits and continuity; differentiation and its techniques; derivatives of functions such as trigonometric, logarithmic, exponential and inverse trigonometric; sketching graph; applications of the derivative; antiderivative and integration area under a curve and between two curves.	4 (4-0-8)
ICMA 211	General Mathematics I Techniques of integration, improper integrals, applications of integration, analytical geometry, infinite series, polar coordinates, parametric equations, vectors in the plane.	4 (4-0-8)
ICMA 212	General Mathematics II Prerequisite: ICMA 211 Three-dimensional space; rectangular, spherical and cylindrical coordinates; functions of several variables; partial derivatives; multiple integrals; vector calculus; line and surface integrals of vector functions; Green's theorem; the divergence theorem; Stoke's theorem.	4 (4-0-8)
ICMA 214	Ordinary Differential Equations Prerequisite: ICMA 102 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.	4 (4-0-8)
ICMA 215	Calculus Derivatives of logarithmic and exponential functions techniques techniques of integration, improper integrals, application of derivatives and integration in life sciences, analytic geometry, infinite series, polar coordinates, parametric equations.	4 (4-0-8)
ICMA 218	Calculus for Physical Sciences Differentiation and integration involving logarithmic, exponential and inverses of trigonometric functions, hyperbolic functions and inverses of hyperbolic functions, techniques of integration improper integrals, L'Hospital's Rule, applications of integration, infinite series, analytic geometry, polar coordinates, parametric equations.	4 (4-0-8)
ICMA 219	Calculus of Several Variables Vectors, three-dimensional space, cylindrical and spherical coordinates, functions of several variables, partial derivatives, calculus of vector-valued functions, multiple integrals, line and surface integrals of vector-valued functions, Green's theorem, the divergence theorem, and Stokes' theorem.	4 (4-0-8)

ICMA 222	Introduction to Mathematical Software Introduction to the use of several software packages which are useful to Mathematics students. Software for symbolic computing, software for numerical computing, and software for mathematical documents, introduction to spreadsheets.	4 (3-2-7)
ICMA 231	Theory of Interest Simple interest; compound interest; effective rate of interest; effective rate of discount; annuities; amortization schedule and sinking fund; yield rates; bonds and other securities; installment loans.	4 (4-0-8)
ICMA 242	Discrete Mathematics Basic logic, set theory, relations, functions, integers, counting technique, algorithms, method of proof, Boolean algebra, topics from graph theory, tree, modeling computation.	4 (4-0-8)
ICMA 313	Number Theory Divisibility, primes and their distribution, congruence, Fermat's theorem, Euler's generalization of Fermat's theorem, primitive roots and indices, quadratic reciprocity, quadratic congruence, perfect numbers	4 (4-0-8)
ICMA 316	Introduction to Graph Theory Graphs and subgraphs, isomorphic graphs, graph and matrices, connectivity, Eulerian and Hamiltonian circuits, planarity, Euler's Formula, digraphs, graph colorings problems and chromatic polynomial, trees, shortest path minimal spanning tree, Ramsey number.	4 (4-0-8)
ICMA 319	Introduction to Combinatorial Mathematics Counting principles, inclusion-exclusion principle, recurrence relations, partitions and generating functions, Stirling's approximation, permutations and groups, graphs, counting patterns, Polya's Theorem.	4 (4-0-8)
ICMA 321	Linear Algebra Matrices, determinant, linear equations, system of linear equations, vector spaces, linear transformations, eigenvalues and eigenvectors, inner product spaces.	4 (4-0-8)
ICMA 322	Advanced Calculus Real and complex number systems; functions; continuity; convergence; differentiation; integration.	4 (4-0-8)
ICMA 323	Partial Differential Equations Heat equation, method of separation of variables, Fourier series, wave equation, Laplace's equation.	4 (4-0-8)
ICMA 324	Real Analysis Prerequisite: ICMA 322 Infinite series, sequence and series of functions, power series, fourier series.	4 (4-0-8)

ICMA 331	Special Functions Prerequisite: ICMA 214 Orthogonal polynomials, gamma functions, beta functions, hypergeometric functions, Legendre functions, spherical harmonics in p dimensions, Bessel functions.	4 (4-0-8)
ICMA 333	Boundary Value Problems Prerequisite: ICMA 323 Sturm-Liouville eigenvalue problems, nonhomogeneous problems, Green's function and generalized Green's function.	4 (4-0-8)
ICMA 335	Complex Variables 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, Rouché's Theorem.	4 (4-0-8)
ICMA 336	Numerical Methods Prerequisites: ICCS 199, ICCS 201, ICCS 203 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.	4 (3-2-7)
ICMA 341	Fluid Dynamics Prerequisite: ICMA 214 Review of fluid mechanics, including one dimensional flow, two dimensional motion, Eulerian methods and momentum, the pressure equation, general equations of motions, irrotational motion, viscous fluid, stream functions, complex potential, method of images, and basic singularities.	4 (4-0-8)
ICMA 344	Time Series Analysis Prerequisite: ICSC 303 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.	4 (4-0-8)
ICMA 346	Optimization Prerequisite: ICMA 336 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.	4 (4-0-8)

ICMA 348	Numerical Methods for Partial Differential Equations Prerequisite: ICMA 323, ICMA 336 Forming and solving elliptic difference equations, relaxation, conjugate gradient and multigrid solution algorithms, discrete maximum principles and error estimates, explicit and implicit difference schemes for parabolic equations and systems, stability of difference schemes, parabolic free boundary problems, Stefan problems, Stochastic algorithms, first-order hyperbolic equations and systems in one space variable.	4 (4-0-8)
ICMA 350	Probability Prerequisites: ICMA 212 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.	4 (4-0-8)
ICMA 352	Experimental Design Prerequisite: ICSC 303 Basic principles of experimental design; completely randomized design; randomized block design; Latin square design; factorial experiments; confounding; split-plot experiment.	4 (4-0-8)
ICMA 353	Actuarial Mathematics I 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.	4(4-0-8)
ICMA 354	Actuarial Mathematics II Prerequisite: ICMA 353 Survival probability; joint life probabilities; last survivor and compound status functions; premiums; life insurance for other status; annuities; annuities paid after death.	4 (4-0-8)
ICMA 355	Introduction to Operation Research Introduction to quantitative analysis, formulation of linear optimization, algebraic and geometric models, simplex method, sensitivity testing, duality, optimization in network, network algorithm.	4 (4-0-8)
ICMA 356	Decision Analysis Prerequisite: ICSC 303 Decision models; expected monetary values; decision flow diagrams; probability assessment; optimization techniques; perfect information; opportunity losses; uncertain payoffs; biased measurements; utility theory; judgmental probability; normal form of analysis; economics of sampling; risk sharing.	4 (4-0-8)

ICMA 360	Sampling Techniques Prerequisite: ICSC 303 Survey methods and planning a survey; elements of random sampling; choices of sampling units; estimation of sample size; techniques of sampling such as simple random, unequal probability, stratified, systematic, cluster, two-stage sampling and miscellaneous survey techniques, errors and non-response.	4 (4-0-8)
ICMA 393	Special Topics in Applied Mathematics I Topics of current interest.	4 (4-0-8)
ICMA 395	Special Topics in Applied Mathematics II Topics of current interest.	4 (4-0-8)
ICMA 423	Set Theory Historical introduction, classes and sets, functions, relations, partially orders classes, axiom of choice and related principle, natural numbers, finite and infinite sets, arithmetic of cardinal numbers, arithmetic of ordinal numbers.	4 (4-0-8)
ICMA 424	Abstract Algebra Partitions and equivalence relations, binary operations, groups, subgroups, permutations, cyclic groups, isomorphism, direct products, cosets, normal subgroups, factor groups, homomorphism, rings, fields, integral domains.	4 (4-0-8)
ICMA 425	Introduction to Topology Topological spaces, closed sets, open sets, homeomorphisms, continuous functions, metric topology, connected spaces, compact spaces, countability axioms, separation axioms, normal spaces, Urysohn lemma, Urysohn metrization theorem.	4 (4-0-8)
ICMA 432	Multivariate Analysis Prerequisites: ICSC 303 Multivariate normal distribution; multiple and partial correlation; Wishart distribution; Hotelling's T distribution; multivariate analysis of variance; discriminant analysis; factor analysis.	4 (4-0-8)
ICMA 434	Introduction to Fourier Analysis Prerequisite: ICMA 322, ICMA 335 Fourier coefficients and Fourier series, spaces, convolution and the delta function, Fourier transforms.	4 (4-0-8)
ICMA 435	Regression Analysis Prerequisite: ICSC 303 Simple and multiple regression, diagnostics, model selection, models with categorical variables.	4 (4-0-8)

ICMA 441	Viscous Fluid Prerequisite: ICMA 214 Couette and Poiseuille flow, Navier-Stokes equation, small Reynolds number flows, flow in convergent and divergent channels, boundary layer analysis, flow along a flat plate; displacement thickness; curved walls and separation; instability of Vortex motion.	4 (4-0-8)
ICMA 444	Research Project in Applied Mathematics Small research project in Mathematics or related fields under the supervision of an advisor.	6 (6-0-12)
ICMA 445	Seminar in Applied Mathematics Student presentations and discussions of research; review of topics.	2 (2-0-4)
ICMA 450	Introduction to Mathematical Modeling Prerequisites: ICMA 214, ICMA 321, ICMA 336 Concepts of mathematical modeling. modeling methods, understand the problem, choosing variables, making assumptions, solving the equations, interpreting the solution and validating the model. improving the model, classic models such as predator-prey interaction, numerical methods for mathematical models.	4 (4-0-8)
ICMA 484	Special Topics in Applied Mathematics III Topics of current interest.	4 (4-0-8)
ICMA 485	Special Topics in Applied Mathematics IV Topics of current interest.	4 (4-0-8)

| BIOLOGICAL SCIENCE |

ICBI 102	Integrated Laboratory in Biological Sciences I Cell structure and function, tissue, cell division, ecology, movement of molecules, respiration, and photosynthesis.	2 (0-4-2)
ICBI 202	Integrated Laboratory in Biological Sciences II Integrated laboratory exercises on cell biology, genetics and molecular biology.	2 (0-4-2)
ICBI 204	Developmental Biology Prerequisites: ICNS 112 or equivalent 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.	4 (4-0-8)
ICBI 206	Medical Ethics Prerequisites: ICNS 112 or equivalent Ethical issues in medical practice and research in biomedical science involving patients or human volunteers; design of field and clinical trials.	2(2-0-4)
ICBI 211	General Microbiology Prerequisites: ICNS 112 or equivalent Structure, physiology and ecology of viruses, bacteria, protozoa and fungi, especially bacteria; aspects of microbiology importance in health, sanitation, food processing and industry; practical exercises included.	4 (3-2-7)
ICBI 212	General Biochemistry Prerequisites: ICNS 112 or equivalent Structure and function of biomolecules; controls and processes of metabolism at the cellular and molecular levels; practical exercises included.	4 (3-2-7)
ICBI 213	Genetics Prerequisites: ICNS 112 or equivalent DNA as genetic material, Mendelian genetics, chromosomal basis of heredity, complex traits, evolutionary genetics, molecular genetics, formulation of genetic hypotheses.	4 (4-0-8)
ICBI 216	Cell Biology Prerequisites: ICNS 112 or equivalent Analysis of the structures and functions of cells, cell action, especially the fundamental relationships between structure and function at the cellular and molecular levels.	4 (4-0-8)

ICBI 221	Animal Biology Prerequisites: ICNS 112 or equivalent A survey of the animal kingdom with emphasis on function, structure, evolution, and ecology; demonstrations and practical exercises included.	4 (3-2-7)
ICBI 231	Plant Biology Prerequisites: ICNS 112 or equivalent A survey of the plant kingdom, their functional anatomy and morphology, physiology, evolution, diversity and utilization; practical exercises, included.	4 (3-2-7)
ICBI 241	Ecology and Conservation Prerequisites: ICNS 112 or equivalent 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 included.	4 (3-2-7)
ICBI 255	Introduction to Oceanography History of oceanography; introduction to the earth and geomorphology; 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.	4 (3-2-7)
ICBI 256	Sustainable Development Sustainable development: 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.	4 (4-0-8)
ICBI 257	Environmental Issues: Past, Present and Future 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 Genetically Modified Organism (GMOs); water issues; urban issues; contemporary and likely future environmental issues.	4 (4-0-8)
ICBI 301	Functional Histology Microscopic characteristics of cells, tissues, and organs of the human body; a systematic and sequential consideration of fundamental histology of the basic tissues and microscopic organization of the major organs and organ systems.	4 (3-2-7)

ICBI 304	Basic Immunology Prerequisites: ICBI 211 Current understanding of the cellular and molecular interactions in the inductions, expression, and regulation of the cellular and humoral 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.	2 (2-0-4)
ICBI 305	Human Anatomy I Prerequisites: ICBI 204 Human anatomy and function. Laboratory exercises include dissections of human cadavers: head, neck, back, anterior chest wall and upper limbs.	4 (2-4-6)
ICBI 306	Human Anatomy II Prerequisite: ICBI 305 Human anatomy and function. Laboratory exercises include dissections of human cadavers: thorax, abdomen, pelvis, perineum and lower limbs.	4 (2-4-6)
ICBI 307	Nutrition and Dietetics Prerequisite: ICNS 112 or equivalent 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.	4 (4-0-8)
ICBI 308	Molecular Biology Prerequisites: ICBI 213 Critical thinking styles, brief of key instruments, reviews on basic functional interactions of macromolecules, molecular biology of genes and genomes, genetic engineering and genome analysis; Group discussion included.	4 (4-0-8)
ICBI 309	Pathobiology Prerequisites: ICNS 112, ICBI 216 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.	4 (3-2-7)

ICBI 310	Mammalian Physiology Prerequisites: ICNS 112 or equivalent Function and control mechanisms of nervous, muscular, circulatory, respiratory, excretory, digestive, endocrine and reproductive systems; their interrelationships in homeostasis.	4 (3-2-7)
ICBI 311	Pharmacology and Toxicology Prerequisites: ICNS 112, ICBI 212 Principles of pharmacology; how selected drugs and chemicals affect biological systems; naturally occurring toxicants, mycotoxin, bacterial toxins, chemical additives, residues of agricultural chemicals and other environmental contaminants; standard procedures used for evaluation of food products; practical exercises included.	4 (3-2-7)
ICBI 314	Tropical Ecology 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.	4 (3-2-7)
ICBI 315	Microbial Physiology and Genetics Prerequisites: ICNS 112, ICBI 211 Microbial growth, metabolism; microbial structures and functions; gene structure and regulation of microbial metabolism; microbial genetic structure; maintenance, expression, and exchange of genetic materials in microbial cells.	4 (4-0-8)
ICBI 316	Environmental Microbiology Prerequisites: ICNS 112, ICBI 211 Influence of aquatic environments on microorganisms; effects of microbial metabolic processes on the quality of water; field survey with laboratory exercises included.	4 (3-2-7)
ICBI 317	Aquatic Ecology Hydrological cycle; physico-chemical properties of water; effect of light in the aquatic environment; physical limnology; biological activity in lakes; nutrient limitation; trophic interaction in lakes; characteristics of material flow in streams and rivers; tides and estuaries; practical exercises, included.	4(4-0-8)
ICBI 318	Aquatic Ecology Field Course 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-lake habitat types, algal communities, benthic invertebrates, fish communities; student presentations.	4 (0-8-4)

ICBI 319	Conservation Biology Prerequisites: ICNS 112 or equivalent 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, reducing and management of endangered species, social and ethical issues in conservation.	4 (4-0-8)
ICBI 320	Population and Community Ecology Prerequisites: ICNS 112 or equivalent 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, laboratory experiments, field trips, sampling and modeling exercises.	4 (3-2-7)
ICBI 321	Invertebrate Zoology Prerequisites: ICNS 112 or equivalent Morphology, anatomy, physiology and taxonomy of the invertebrates from protozoa to coelomates; phylogenetic relationships; ecology and behavior; demonstrations and practical exercises included.	4 (3-2-7)
ICBI 322	Vertebrate Zoology Prerequisites: ICNS 112 or equivalent Morphology, physiology, behavior and taxonomy of various vertebrate groups; comparative anatomy in relationship to the evolution of the vertebrates; demonstrations and laboratory exercises included.	4 (3-2-7)
ICBI 330	Biology of Fungi Prerequisites: ICBI 211, 212, 213 Kingdom of fungi, fungal like microorganisms (slime mold and water mold), morphology and physiology, nutrition and metabolism, growth and differentiation, reproduction, life cycle, classification, ecological roles, culture collection, advantage of fungi and fungal products.	4 (4-0-8)
ICBI 332	Medical Microbiology Prerequisites: ICBI 211, ICBI 212 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.	4 (3-2-7)

ICBI 341	Neurobiology Prerequisites: ICNS 112, ICBI 204 Developmental neurobiology, neuroanatomy, and neurophysiology; some clinical aspects as a result of neuropathological defects or lesions; practical exercises included.	4 (3-2-7)
ICBI 344	Environmental Science Prerequisites: ICNS 112 or equivalent Ecological concepts related to the problems of pollution and their impact on agriculture and wildlife communities, natural resources, sustainable development and maintenance of clean environment.	4 (4-0-8)
ICBI 372	Utilization of Water and Wastewater Treatment 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.	4 (3-2-7)
ICBI 391	Health Psychology An individual's psychology and the ways it can affect adjustment to illness; prevention of illness through health promotion.	4 (4-0-8)
ICBI 402	Epidemiology Prerequisites: ICNS 112, ICBI 211, ICBI 412 Prevalence of endemic health problems caused by infectious diseases or non-infectious disorders; diseases of Southeast Asia in comparison with those in tropical Africa and America; field studies included.	4 (3-2-7)
ICBI 403	Introduction to Tropical Medicine Prerequisites: ICNS 112, ICBI 211 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; preventive tips for aliens living in and travelling to Thailand.	4 (4-0-8)
ICBI 405	Community Health Prerequisites: ICNS 112 or equivalent Survey of community health status, primary health care concept, health system analysis and health manpower development; practical sessions at local hospitals and field trips included.	4 (3-2-7)

ICBI 406	Ergonomics Physiological and psychological aspects in the workplace emphasizing the interfacing of man, machine and environment; work station design; work posture; manual materials handling; work-rest cycle, and seating.	2 (2-0-4)
ICBI 407	Occupational Health and Safety 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; evaluating harmful effects of such factors to control them; prevention of dissatisfaction and risk assessment in the workplace.	4 (4-0-8)
ICBI 411	Psychopathology Prerequisites: ICNS 112 or equivalent Nature and causes of maladjusted behavior; factors which may affect personality and development.	4 (4-0-8)
ICBI 412	Parasitology Prerequisites: ICNS 112, ICBI 211 Biology, ecology and physiology of parasites of man and some domestic animals; molecular parasitology; basic research in control and diagnosis of parasite infection; demonstrations and laboratory exercises included.	4 (3-2-7)
ICBI 414	Industrial Microbiology Prerequisites: ICNS 112, ICBI 211 Morphology, physiology, nutrition and growth of microorganisms; taxonomy and identification of microorganisms important to health; industrial processes; field visits and laboratory exercises included.	4 (4-0-8)
ICBI 415	Biotechnology Prerequisites: ICNS 112, ICBI 213, ICBI 308 Technology and the application of scientific principles in relation to animals, plants, microorganisms; production of cellular compounds in public health, agriculture and industry.	4 (4-0-8)
ICBI 421	Entomology Prerequisites: ICNS 112 or equivalent Insect morphology, physiology, systematics, natural history, and relationships with humans; field survey with laboratory exercises included.	4 (3-2-7)

ICBI 432	Plant Biotechnology Prerequisite: ICBI 231 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.	4 (4-0-8)
ICBI 433	Fermentation Technology Prerequisites: ICBI 211, ICBI 212 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.	4 (4-0-8)
ICBI 434	Food Biotechnology Prerequisite: ICBI 212 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.	4 (4-0-8)
ICBI 435	Molecular Techniques in Biotechnology Prerequisites: ICBI 211, ICBI212, ICBI213 Principle of recombinant DNA technology; restriction endonuclease; DNA cloning; transformation; gene library; screening for the right clone; manipulation of gene expression; DNA sequencing, PCR, directed mutagenesis, DNA fingerprint; pulsed-field-gel electrophoresis; stem cell technology; gene therapy.	4 (4-0-8)
ICBI 436	Industrial Enzymology Prerequisites: ICBI 211, ICBI212 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 is imitating 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.	4 (3-2-7)
ICBI 437	Current Issues in Biotechnology Prerequisites: ICBI 211, ICBI212 This course is organized to give lecture and discuss on the recent advances in biotechnology research and development. A lecture topic on bioinformatics will be included. Local and foreign expert will also be invited according to the opportunity.	2 (2-0-4)

ICBI 441	Marine Biology Prerequisites: ICNS 112 or equivalent Natural history of marine animals, exclusive of protozoa and insects; types of environment in the ocean, 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 included.	4 (3-2-7)
ICBI 464	Cell Technology Prerequisites: ICNS 112, ICBI 216 Culturing techniques for plant and animal cells; biotechnology applications; animal cells as hosts for virus cultures; vaccine production, antibody production, industrial production of proteins and hormones; genetic engineering using cell technology.	4 (3-2-7)
ICBI 491	Seminar in Biological Sciences Student presentations and discussions of research or review of topics of current interest in biological sciences.	2 (2-0-4)
ICBI 498	Research Project in Biological Sciences Small research project in biological sciences under the supervision of an advisor.	6 (0-12-6)

| BUSINESS ADMINISTRATION |

ICMB 201	Macroeconomics Introduction to macroeconomics principle, theories of output, consumption, inflation, unemployment, fiscal and monetary policy, international monetary system.	4 (4-0-8)
ICMB 202	Microeconomics Introduction to microeconomics principles, pricing theory, economic scarcity, consumer behavior, production costs, market structure, utility analysis, and distribution of income.	4 (4-0-8)
ICMB 211	Fundamental Financial Accounting Business transactions and financial statements. evolution of accounting, recording and classifying financial transactions, the preparation of financial statements, characteristics of various types of accounts, the accounting principles, and the usefulness and limitations of accounting information.	4 (4-0-8)
ICMB 212	Managerial Accounting Prerequisites: ICMB 211 Cost accounting and the role of managerial accounting in planning, organizing, controlling functions, and decision support.	4 (4-0-8)
ICMB 221	Principles of Marketing Managerial marketing, product management, channel of distribution, price system, promotional activities, and introduction to consumer behavior.	4 (4-0-8)
ICMB 232	Essentials of Management The basic management functions, the basic skills required in management, principles of management developed, the necessary attributes of a manager, and coverage of significant management theories, introduction to mini-case studies involving group work as a member of a management team.	4 (4-0-8)
ICMB 233	Human Resource Management Theories, practices and concepts of people management in organization, and the relationship between human resource management and organizational performance.	4 (4-0-8)
ICMB 281	Computers in Management The impact of modern information technology on the structure and management of organizations, basic computer literacy use of application programs as communication tools (primarily e-mail, word processors, database management systems, spread sheets, and presentation graphics).	4 (4-0-8)

ICMB 341	Business Law Business law, regulations, elements of contract, property law, employment law, partnership and corporation law.	4 (4-0-8)
ICMB 351	International Business Management Prerequisite: ICMB 232 International business operations, organization structure, finance and accounting systems, taxation system, marketing strategy, cultural differences, global trade, capital markets and economic growth, the impact of regional trading blocs, corporate global competitiveness, and global strategies.	4 (4-0-8)
ICMB 363	Management Science Prerequisite: ICNS 104 Model building as a foundation for rational decision making and problem solving, linear and nonlinear programming, network models, queuing analysis, probability and decision theory, non-parametric statistics, and simulation, computer software applying these techniques in the analysis of a wide variety of decision problems.	4 (4-0-8)
ICMB 371	Business Finance Prerequisites: ICNS 104, ICMB 211 An introduction to the principles of financial management, the role of finance within the firm, the firm and its objectives, time value of money, valuation of financial assets, capital budgeting techniques, risk and return, costs of capital, estimation and forecasting of cash flows, project evaluation, and other financial management tools.	4 (4-0-8)
ICMB 372	Financial Management Prerequisite: ICMB 371 Financial policies affecting decision making in financial management, the differences in the need for finance in terms of the operational characteristics of particular industries, long-term financial planning, net working capital management, asset pricing theory, efficient market hypothesis, capital structure, and dividend policy.	4 (4-0-8)
ICMB 431	Strategic Management Prerequisites: ICMB 351, Seniors The fundamental elements of organizational management strategy, the process and frameworks of strategic management, the internal and external environment, the mission of the organization, organizational objectives and policies, and business strategy.	4 (4-0-8)

ICMB 491	Practical Business Training - On Campus Prerequisites: Juniors, Seniors Serving an internship at MUIC's training facility, learning the day to day operations of the business, emphasizing on the importance of planning and control.	8 (0-24-8)
ICMB 492	Practical Business Training - Off Campus Prerequisite: Seniors Serving an internship at a company outside MUIC, placements arranged according to major.	12 (0-36-12)
ICMB 493	Directed Research Prerequisites: Juniors, Seniors, Pre-registration Developing a research paper concerning a current business, stating a hypothesis, collecting data and interpreting the data through proven testing methods, and reporting results.	8 (8-0-8)

| BUSINESS ECONOMICS |

ICBE 341	Mathematics for Business and Economics Prerequisite: ICNS 104 Introduction to mathematical tools in economic analysis and how to use these tools to answer economic questions, matrix algebra, differentiation, comparative statistics, optimization, constrained optimization, integration, and differential equations.	4 (4-0-8)
ICBE 342	Intermediate Microeconomics Prerequisite: ICMB 202 Consumption theory and indifference curve analysis with emphasis on consumption overtime, theory of information cost and market with risk, theory of production and cost, theory of the firm, different types of market structure and behavior, price determination in factor markets, general equilibrium analysis, and introductory welfare economics.	4 (4-0-8)
ICBE 343	Intermediate Macroeconomics Prerequisite: ICMB 201 Relationship between product, money, security and labor markets and the foreign sector in determining general economic stability, with their effects on income, employment and the general price level, and classical and Keynesian theories on the analysis of economic problems and policy implications.	4 (4-0-8)
ICBE 344	Econometrics I Prerequisites: ICMB 201, ICMB 202, ICNS 104 Statistical and economic theory in analyzing economic and financial market data, properties of price data, normality and log-normality, risk measurement, OLS (ordinary least square technique) and its limitations, parameter estimation techniques, and the application of simple and multiple regression models to economic analysis.	4 (4-0-8)
ICBE 345	Monetary Policy Prerequisite: ICBE 343 Theoretical and policy aspects of monetary economics, monetary theory, the supply of money, level and growth rate of money, transmission of monetary shocks, theory and practice of monetary policy, central bank operations, and evolution of monetary institutions.	4 (4-0-8)

ICBE 346	Public Economics Prerequisite: ICBE 343 The need for public policies and the analysis of government expenditures, the rationale for government economic activity, collective choice, public goods and externalities, income redistribution, and the economic analysis of taxation, including efficiency, incidence, effect on distribution of income, personal and corporate income taxes, sales and consumption taxes.	4 (4-0-8)
ICBE 347	Development Economics Prerequisite: ICBE 343 Economic change and industrialization in developing countries, comparative analysis of underlying social factors, interactions between traditional and modern sectors, international relationships, the problems faced by less developed countries, and the economic mechanisms that must be taken into account in the raising of living standards.	4 (4-0-8)
ICBE 348	Economics of Human Resources Prerequisite: ICBE 342 Models of labor market demand and supply, wage level and structure, analysis of government, labor unions, other constraints on competitive systems of wage determination, economic analysis of compensation policy, hiring and retention strategies, incentive pay, relative performance evaluation, teams, promotions, seniority, and organization design.	4 (4-0-8)
ICBE 441	Econometrics II Prerequisite: ICBE 344 Techniques for forecasting in economics and business, trends, cycles, and seasonality, the analysis of dynamic, finite and infinite distributed lag models, stationarity, cointegrated series, stochastic regressor issues, systems of equations, and approaches to economic forecasting using ARIMA and VAR models, understanding and applying the use of categorical data, the estimation of differentials and some basic binary choice models, some of the problems associated with cross-section data and applying the techniques to real data.	4 (4-0-8)
ICBE 442	International Finance Prerequisite: ICBE 343 Nature of adjustment in open economies under various monetary systems, financial exchange across international boundaries, theory of comparative advantage, balance of payments and adjustment, fixed exchange rates, flexible exchange rates, and international institutions that facilitates financial transactions.	4 (4-0-8)

ICBE 443	International Trade Prerequisites: ICMB 201, ICMB 202 Theories involved in international trade, practices and policies including tariffs, quotas, and other business barriers, current issues of international trade including impact of competitive markets, innovation and growth of world trade and its impact on developing countries, negotiating skills required to confront differences of opinion and influence agreements, examination of different game plans for both informal and formal negotiations.	4 (4-0-8)
ICBE 444	Industrial Organization Prerequisite: ICMB 202 Development of microeconomic models to explain the structure and performance of markets, analysis of the firm's behavior in imperfectly competitive markets, monopoly, oligopoly, and monopolistic competition, the conditions to exercise monopoly power, the relationship between profit rates and concentration or size, the persistence of profits over time, industry turnover and interindustry comparisons, analysis of antitrust policy with a focus on industrial structure.	4 (4-0-8)
ICBE 445	Economics of Strategy Prerequisite: ICBE 444 Firm's organization and pricing under conditions of less than perfect competition, an examination of pricing practices such as price discrimination, tie-in selling, predatory pricing, resale price maintenance, information costs and advertising, exclusive dealings, and territorial arrangements.	4 (4-0-8)
ICBE 446	Cost-Benefit Analysis Prerequisites: ICBE 342, ICBE 343 An understanding of the economist's approach to evaluating government investments or programs, the welfare economics foundation for economic valuation methods and environmental cost-benefit analysis, other economic theories relevant to project and policy appraisal.	4 (4-0-8)
ICBE 447	Corporate Governance and Business Ethics Prerequisites: ICMB 341, ICMB 372 How modern corporations are governed and to whom they should be responsible, role of the board of directors, the reaggregation of shareholder power due to concentrated institutional holdings, accountability of the board of directors to shareholders and other corporate stakeholders (employees, customers, suppliers, and communities), ethical issues facing corporate managers making decisions and their impact on employees, customers, and the public.	4 (4-0-8)

| CHEMISTRY |

ICCH 111	General Chemistry The course covers the atomic structure and chemical bonding; gases, solids, liquids and solutions stoichiometry; chemical thermodynamics and kinetics; chemical equilibria; acid and bases; acid-base equilibria and buffers; practical exercises include general techniques in chemistry, simple qualitative and quantitative analysis and acid-base titration.	4 (3-2-7)
ICCH 210	General Chemistry I Comprehensive concepts and principles of chemistry; atomic structure; chemical bonding; stoichiometry; gases, solids, liquids and solutions; chemical thermodynamics and kinetics.	4 (4-0-8)
ICCH 211	General Chemistry II Prerequisite: ICCH 210 Concepts of general chemistry: chemical and ionic equilibria; electrochemistry; periodic properties; periodic table; transition metals; nuclear chemistry.	4 (4-0-8)
ICCH 220	Basic Organic Chemistry Prerequisites: ICCH 111 or equivalent The course will cover the following topics: bondings and structures; classification of organic compounds; nomenclature and stereochemistry; properties, preparations, reactions and uses of aliphatic and aromatic compounds, organohalogens, alcohols and phenols, aldehydes and ketones, ethers, carboxylic acids and their derivatives, amines, carbohydrates, amino acids, proteins, lipids and nucleic acids. Practical exercises include crystallization, melting point determination, boiling point determination, extraction and chromatography.	4 (3-2-7)
ICCH 221	Organic Chemistry I Prerequisite: ICCH 210 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.	4 (4-0-8)
ICCH 222	Organic Chemistry II Prerequisite: ICCH 221 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.	4 (4-0-8)

ICCH 224	Integrated Laboratory Techniques in Chemistry I Laboratory practices for general chemistry and organic chemistry with inorganic and organic unknown determination included as end of course final practical and uses of spectroscopic analytical equipment for monitoring reactions and molecular characterizations.	2 (0-4-2)
ICCH 311	Analytical Chemistry Prerequisite: ICCH 210 Techniques of separation and concepts of modern analytical methods essential for quantitative and qualitative characterization; treatment of analytical data; principles and applications of chemical equilibriums; electrochemical methods; separation methods; practical exercises involving uses of spectroscopic analytical equipment included.	4 (3-2-7)
ICCH 316	Modern Methods of Analysis Prerequisite: ICCH 311 Concepts of modern analytical methods for quantitative and qualitative analyses and molecular structure characterization; gas and liquid chromatography, molecular absorption and emission spectroscopy; atomic absorption and emission spectroscopy; practical exercises involving uses of spectroscopic analytical equipment included.	4 (3-2-7)
ICCH 321	Organic Spectroscopy Prerequisite: ICCH 222 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.	4 (4-0-8)
ICCH 322	Advanced Organic Chemistry Prerequisite: ICCH 222 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.	4 (4-0-8)
ICCH 329	Integrated Laboratory Techniques in Chemistry II Laboratory practicals for inorganic and physical chemistry.	2 (0-4-2)
ICCH 333	Physical Chemistry I Prerequisite: ICCH 210 Concepts of classical physical chemistry; behaviour of gases; First Law of thermodynamics, Second and Third Laws of thermodynamics; chemical equilibrium; phases and solutions; phase equilibria.	4 (4-0-8)

ICCH 334	Physical Chemistry II Prerequisite: ICCH 333 Concepts of classical and non-classical physical chemistry; electrochemical cells; kinetics; composite reaction mechanisms; quantum mechanics; atom structure and chemical bond.	4 (4-0-8)
ICCH 335	Physical Chemistry III Prerequisite: ICCH 334 A detailed and highly mathematical study of chemical spectroscopy and molecular statistics.	4 (4-0-8)
ICCH 381	Mathematics for Chemists 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.	4 (4-0-8)
ICCH 390	Organic Chemistry Laboratory Techniques Prerequisites: ICCH 221, ICCH 222, ICCH 224 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 spectroscopic analysis.	2 (0-4-2)
ICCH 421	Physical Organic Chemistry Prerequisite: ICCH 222 A study of organic chemistry via mechanistic approach; aliphatic nucleophilic substitution reactions; aromatic electrophilic reactions; aromatic nucleophilic substitutions; photochemistry.	4 (4-0-8)
ICCH 422	Organic Synthesis Prerequisite: ICCH 222 A detailed and mechanistic study of organic reactions and synthesis; generation and synthetic uses of enolates; oxidation methods; reduction reactions via catalytic reduction and group III hydrides; halogenations.	4 (4-0-8)
ICCH 423	Heterocyclic Chemistry Prerequisite: ICCH 222 Introductory to heterocyclic chemistry; synthesis and reactions of thiophene, furan, pyrrole, indole, benzofuran, benzothiophene, oxazole, pyridine, pyrilium salts, quinoline, isoquinoline and pyridazine.	4 (4-0-8)

ICCH 424	Natural Product Chemistry Prerequisite: ICCH 222 Natural product chemistry; classification of natural products; isolation techniques and physiochemical data; terpenes; steroids; fatty acids and related compounds; sugars; carboaromatic and related compounds; alkaloids and non-alkaloids containing nitrogen; aspects of natural product photochemistry.	4 (4-0-8)
ICCH 431	Advanced Physical Chemistry Prerequisite: ICCH 334 A detailed study of specialized topics; solid state and liquid state, surface chemistry, colloids and transport properties.	4 (4-0-8)
ICCH 432	Special Topics in Physical Chemistry Prerequisite: ICCH 334 A detailed study of quantum chemistry and statistical thermodynamics.	2 (2-0-4)
ICCH 441	Inorganic Chemistry I Prerequisite: ICCH 221 Concepts of inorganic chemistry; structure of the atom; bonding models in inorganic chemistry; covalent bond; structure and reactivity; chemical forces.	4 (4-0-8)
ICCH 442	Inorganic Chemistry II Prerequisite: ICCH 441 Remaining 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.	4 (4-0-8)
ICCH 443	Special Topics in Inorganic Chemistry Prerequisite: ICCH 442 A detailed study the chemistries of transition metals, organometallic chemistry and inorganic chains, rings and clusters.	2 (2-0-4)
ICCH 444	Environmental Chemistry Introduction to chemical aspects of the problem and solution in the environment; field trips and practical exercises included.	4 (3-2-7)
ICCH 451	Industrial Chemistry Introduction to industrial chemistry; automatic process control; construction materials; calculation of pressure and temperature stresses; management in industrial organization; feasibility studies; material and energy balances; industrial water treatment; the control of air and water pollution; field trips included.	4 (3-2-7)

ICCH 452	Polymer Science and Technology Prerequisite: ICCH 222 Introductory to polymers, syntheses, applications and implications to industry of polymers; polymerization reactions, structures and properties of polymers, polymer processing; common polymers and their applications.	4 (4-0-8)
ICCH 453	Special Topics in Industrial Chemistry Prerequisite: ICCH 451 Application of organic chemical reactions and mechanisms in the petrochemical industry.	2 (2-0-4)
ICCH 454	Seminar in Chemistry Prerequisite: Seniors or with special permission of instructor. Current topics of interest in the frontier of chemical research discussed with emphasis on searching chemical database for research papers for in-class discussion.	2 (2-0-4)
ICCH 455	Senior Project in Chemistry Prerequisite: Seniors or with special permission of instructor. Small research project in chemistry under 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.	6 (0-12-6)
ICCH 456	Nuclear and Radiochemistry Prerequisite: ICCH 221 Concept of nuclear and radiochemistry; law of radioisotope decay; reaction between nuclear radiation and matter; detection of radiation and dose determination; hazards from radiation; application of radioisotope in chemistry. Field trips and practical exercises included.	4 (3-2-7)
ICCH 457	Industrial Chemical Processes Prerequisite: ICCH 451 Various industrial chemical processes and their industries; pulp and paper, soap and detergent, fermentation, potassium and nitrogen industries, field trips and practical exercises included.	4 (3-2-7)
ICCH 461	Pharmacological Chemistry Prerequisites: ICCH 221, 222 Introduction to pharmacological chemistry; application of organic chemistry to pharmacology and to the synthesis of drugs; chemical mediators; chemotherapy.	4 (4-0-8)

ICCH 462	Macromolecules Prerequisites: ICCH 221, 222 Structures and functions of biological active polymers; polypeptides; protein structures and folding; DNA; RNA and carbohydrates.	4 (4-0-8)
ICCH 471	Bioorganic Chemistry Mechanisms and the reactions of selected enzymes from the perspective of mechanistic organic chemistry and physical organic chemistry; three-dimensional structure of enzymes; chemical catalysis; enzyme kinetics; stereochemistry of enzyme reactions.	4 (4-0-8)
ICCH 472	Secondary Metabolisms Prerequisites: ICCH 221, 222, 422 Selected classes of secondary metabolites; biosynthetic pathways and mechanistic syntheses of fatty acids, polyketides, isoprenoids, aromatics and amino acids.	4 (4-0-8)

| CHINESE |

ICLC 211	<p>Pre-intermediate Chinese I</p> <p>Prerequisites: ICML 133, refresher course or placement test.</p> <p>Elements of complex grammar and vocabulary related to a variety of everyday contexts allowing the students to discuss familiar topics, express opinions in a more elaborate way, ask for clarification, read a wider variety of texts, and write simple letters or narratives.</p>	4 (4-0-8)
ICLC 212	<p>Pre-intermediate Chinese II</p> <p>Prerequisite: ICLC 211</p> <p>More complex grammar and vocabulary allowing the students to hold a short conversation, ask for, understand and offer information in a broader variety of familiar topics, read more elaborate texts, and write longer letters or narratives.</p>	4 (4-0-8)
ICLC 213	<p>Pre-intermediate Chinese III</p> <p>Prerequisite: ICLC 212</p> <p>Consolidation of the acquisitions of ICLC 211 and 212 and further mastering of complex grammar and vocabulary in order to allow the students to fully reach a standard pre-intermediate level of proficiency.</p>	4 (4-0-8)
ICLC 311	<p>Intermediate Chinese I</p> <p>Prerequisite: ICLC 213</p> <p>Elements of advanced 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.</p>	4 (4-0-8)
ICLC 312	<p>Intermediate Chinese II</p> <p>Prerequisite: ICLC 311</p> <p>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 situations, and read and write simple argumentative texts related to such contexts.</p>	4 (4-0-8)
ICLC 313	<p>Intermediate Chinese III</p> <p>Prerequisite: ICLC 312</p> <p>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.</p>	4 (4-0-8)

- ICLC 320 Intermediate Chinese: Written Skills A 4 (4-0-8)**
Prerequisite: ICLC 313
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.
- ICLC 330 Intermediate Chinese: Oral Skills A 4 (4-0-8)**
Prerequisite: ICLC 320
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.

| COMMUNICATION DESIGN |

ICCD 100	Observational Drawing An introduction to the visual language of drawing with an emphasis on depicting objects and the human form in space. How the parts of the drawing relate to each other and to the composition as a whole. Fundamental skills in using traditional black-and-white media.	4 (0-8-4)
ICCD 101	Perspective Drawing Prerequisite: ICCD 100 A continuation of the investigation of analytical seeing and drawing that began in Observational Drawing I: understanding of perspective systems and application of those systems to analytical and observational drawing. More advanced skills in using black-and-white media, fundamental skills in using color.	4 (0-8-4)
ICCD 110	Visual Dynamics I A problem solving course that explores the fundamental elements and principles of two-dimensional design, and that broadens the beginner student understanding of composition in terms of concept, methods and materials. Development and improvement of technical and media skills.	4 (0-8-4)
ICCD 111	Visual Dynamics II Prerequisite: ICCD 110 A further exploration of two-dimensional design elements and principles, with a focus on color. Investigation of the physical, perceptual, psychological, and organizational properties of color through the study of color theories in conjunction with studio problems.	4 (0-8-4)
ICCD 120	Space, Form and Materials I Introduction to basic concepts and skills of three-dimensional design. Conception and construction of simple to increasingly complex three-dimensional forms. In-depth critiques requiring student participation and evaluation of own and others' projects according to principles learned in lectures.	4 (0-8-4)
ICCD 220	Space, Form and Materials II Prerequisite: ICCD 120 Building on basic concepts and skills of three-dimensional design learned in Space, Form and Materials I. Hands-on projects requiring increasingly complex concept development and production processes. Critiques requiring student participation and evaluation of own and others' projects according to principles learned in lectures. Heightened expectations for appropriate investment in design process, attention to detail, and awareness of functional requirements of designed forms.	4 (0-8-4)

ICCD 230	Visual Statement Seminar/studio hybrid course in which research and process are emphasized over product. Content-based assignments intended to challenge students' conceptual, critical and communicative skills. Emphasis on visual literacy, with field trips to view contemporary art and other forms of cultural production. Encouragement of experimentation, exploration of self-developed concepts and risk-taking. Evaluation of projects by discussion and critique in terms of their conceptual development and effective use of visual language.	4 (0-8-4)
ICCD 240	Typography I Prerequisites: ICCD 101, ICCD 111, ICCD 220, ICCD 230 Study of the use of typography in the overall design concept: type as communicative and creative element, organizational skills necessary for clear communication, and formative aspects of typographic symbols and arrangement.	4 (0-8-4)
ICCD 241	Typography II Prerequisite: ICCD 240 An advanced study of typography: the analysis of the perceptual aspects of type, the exploration and clarification of typographic variables, the logical issues of planning and organizing paginated and information systems (2D and 3D).	4 (0-8-4)
ICCD 242	Design Technology I Prerequisites: ICCD 101, ICCD 111, ICCD 220, ICCD 230 An introduction to the general function-based Macintosh software for publication design including the incorporation of the graphics applications platform and the design process	4 (0-8-4)
ICCD 243	Design Technology II Prerequisite: ICCD 242 An introduction to the general function-based software for publication design including the incorporation of the graphics applications platform and the design process.	4 (0-8-4)
ICCD 244	Communication Design I Prerequisites: ICCD 101, ICCD 111, ICCD 220, ICCD 230 Introduction to the fundamentals of communication design through theoretical and applied studies in design, problem solving, communication and presentation.	4 (0-8-4)
ICCD 245	Communication Design II Prerequisite: ICCD 244 Continued investigation of topics introduced in Communication Design I. Further study of the fundamentals of Communication Design through theoretical and applied studies in design, problem solving, communication and presentation.	4 (0-8-4)

ICCD 340	Design Technology III Prerequisite: ICCD 243 An introduction to multimedia authoring software.	4 (0-8-4)
ICCD 350	Advertising Prerequisites: ICCD 241, ICCD 243, ICCD 245 A study of the foundation of advertising from historical to current marketing strategies, including research, account service, copyrighting, art direction, illustration, photography and self-promotion.	4 (0-8-4)
ICCD 351	Environmental Graphics Prerequisites: ICCD 340, ICCD 350 A study of professional design techniques, mechanics and practices examined through problems related to environmental graphics.	4 (0-8-4)
ICCD 352	Integrated Branding Prerequisites: ICCD 340, ICCD 350 An advanced study of design systems as applied to corporate identity, integrated branding material, and symbology as a component of communication systems.	4 (0-8-4)
ICCD 360	Graphic Design History Prerequisite: ICCM 202 or equivalent Historical survey of graphic design, presenting work from various perspectives: cultural and cross-cultural, historical and timeless. Focused on shaping visual sensibilities and broadening the palette of references essential to the process of design thinking.	4 (4-0-8)
ICCD 370	Professional Writing for Designers Prerequisite: ICCM 202 or equivalent Introduction to and practical experience in professional writing, with a specific focus on genres essential to the designer. Emphasis on correct tone, format, and polished grammar and punctuation. Use of research skills to build appropriate content. Peer editing /proofreading and professional criticism.	4(4-0-8)
ICCD 380	Communication Design Practicum Prerequisites: ICCD 351, ICCD 352 Application of theoretical and practical training to professional projects intended for actual publication. Individual and group projects for non-profit clients selected by the instructor. Student engagement and responsibility from conception through production of the finished product.	4 (0-8-4)

ICCD 440	Senior Seminar: Thesis Research and Development Prerequisites: ICCD 370, ICCD 380 Initiation to the process of concept development of the senior thesis project in both 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 faculty support to engage student in process of critical inquiry.	4(4-0-8)
ICCD 470	Professional Ethics Examination of contemporary design practice through various ethical scenarios, ranging from practical to philosophical. Projects, workshops, writings, research and critical discussions as preparation to enter the field as well-informed and critical participants. Readings and examples chosen by instructor, drawn from current local and international sources. Client/designer relationships, contractual obligations, spec work, copyright, etc.	4 (4-0-8)
ICCD 471	Senior Writing Seminar Prerequisite: ICCD 440 Advanced academic writing course focused on the production of the senior thesis and statement of intent for inclusion in the public exhibition of thesis projects. Various strategies to lead students from research, through drafting and editing, to finished formal document.	4 (4-0-8)
ICCD 472	Professional Portfolio Development and Presentation Prerequisite: ICCD 471 Instruction and criticism toward development of professional portfolio for review by prospective employers, clients or graduate school admission committees. Print and digital formats. Improvements and revisions to existing work and/or the creation of new work to best showcase the individual student's skills. Portfolio presentation skills honed through presentations to and coaching from peers and guest critics.	4 (4-0-8)
ICCD 490	Communication Design Thesis I Prerequisite: ICCD 440 Two trimester project growing from research conducted in Senior Seminar. Further development and investigation of thesis question/problem and development of design system or concept to address it, employing communication design theory and practical synthesis and application of visual principles.	4 (0-8-4)

ICCD 491	Communication Design Thesis II Prerequisite: ICCD 490 Continuation of ICCD 491 (Communication Design Thesis I). Development of design system or concept to address research conducted in ICCD 442 (Senior Seminar), employing communication design theory and practical synthesis and application of visual principles. Primarily independent study with peer and instructor criticism and support. Coordination with course content of ICCD 493 (Public Exhibition).	4 (0-8-4)
ICCD 492	Public Exhibition Prerequisites: ICCD 490 Exhibition of Senior Thesis Project required for graduation from the Communication Design major. Emphasis on skillfully presenting a consistent thematic body of work. Details of presentation relating to publicity and display are determined and realized.	4 (0-8-4)
ICCD 306	Intermediate Observational Drawing Prerequisite: ICCD 101 A continuation of the investigation of analytical seeing and drawing that began in Observational Drawing and Perspective Drawing. Study and employment of more advanced skills using black-and-white and color media. Weekly homework assignments requiring dedicated recording of observations in sketchbook. Assembly of portfolio for end-of-semester evaluation.	4 (0-8-4)
ICCD 356	Information Graphics Prerequisites: ICCD 241, ICCD 243, ICCD 245 A study of visual communication for the presentation of information including the organization and the structure of information flow, hierarchy and graphics arrangement.	4 (0-8-4)
ICCD 357	Animation Prerequisite: ICCD 340, ICCD 350 An advanced study of kinetic media applications through software, platform related information, and the design of animated graphic elements and environments.	4 (0-8-4)
ICCD 358	Web Design Prerequisite: ICCD 241, ICCD 245, ICCD 340 Elective course focusing on the construction and management of web-based design, and building on the course content of ICCD 244 Design Technology III. Focus on problem-solving through projects related to design and redesign of elements of web presence. Exploration of current software dedicated to the process of web graphics generation. Lectures introducing projects and related technical and theoretical concerns.	4 (0-8-4)

ICCD 366	History of Modern Design Prerequisite: ICHM 142 History of Modern design presented in all its forms from late 19th to late 20th century, tracing and relating major movements. Lectures providing visual examples and contextual information accompanied by weekly reading assignments. Term paper based on research into selected topic.	4(4-0-8)
ICCD 376	Communication Design Materials and Processes Prerequisites: ICCD 340, ICCD 350 A study of processes and materials involved communication design production including pre-press, paper selection and specification, ink systems, output technology in printing and electronic media.	4 (4-0-8)
ICCD 377	Critical Issues in Communication Design Prerequisites: ICCD 351, ICCD352 Examining the role of design in contemporary culture, with emphasis on issues pertaining to communication design. Critical readings of essays with response through writing and discussion. Field trips to local events, exhibitions, and design instances for study and analysis. Student research and presentations on selected topics.	4(4-0-8)
ICCD 416	Printmaking Prerequisites: ICCD 101, ICCD 111 Introduction to the history and methods of printmaking through lectures, demonstrations and studio projects. Exploration of woodblock, lithograph, screen and monotype printing techniques. Lectures providing historical and contemporary examples of each technique.	4 (0-8-4)
ICCD 426	Hand-made Books Prerequisites: ICCD 111, ICCD 220 Studio course using hand-made books as a means to investigate type, image, narrative and sequence. Lectures including historical and contemporary examples, with particular attention to "artists' books". Demonstrations of classic and experimental methods of production, including folding and binding techniques. Project assignments requiring the student to consider book-specific problems and solutions, while marrying form to content.	4 (0-8-4)

ICCD 456	Package Design Prerequisites: ICCD 241, ICCD 243, ICCD 245 Elective course focusing on package design as a vital and particular area of communication design, involving form, structure, materials, color, imagery, typography and product information. Examination of how packages contain, protect, transport, dispense, identify and distinguish the product. Project assignments involving students in problem-solving various aspects of package design, while considering of the relationship between package design and related fields, such as branding, advertising and information graphics.	4 (0-8-4)
ICCD 457	Illustration Prerequisites: ICCD 241, ICCD 243, ICCD 245 Study of basic illustration process from production of thumbnails to finished artwork. Projects requiring response to brief given by the instructor, using both traditional media and digital applications/software. Fostering of creativity and concept development. Emphasis on visual research skills, craftsmanship, and professionalism. Submission of process book for each project. Presentations by guest professional(s).	4 (0-8-4)
ICCD 466	History of Advertising Prerequisite: ICHM 142 An introduction to the history of advertising from the pre-industrial period to the present. Consideration of advertising in its relationship to communication design, and from the fields of sociology, psychology, critical theory, political science, etc. Discussion of the connection between the growth of advertising and parallel technological developments. Lectures and presentation of historical examples and assignment of weekly readings. Completion of research paper and oral/visual presentation.	4 (4-0-8)
ICCD 476	Green Design Seminar An introduction to integrating the principles of sustainability into design practices. Exploration of innovative alternatives to materials and processes harmful to the environment. Research, presentations and design projects promote critical consideration and involvement with issues affecting design professionals.	4 (4-0-8)
ICCD 486	Advanced Communication Design Practicum Prerequisite: ICCD 380 Advanced application of theoretical and practical training to professional projects intended for actual publication. Individual and group projects of increasing depth and complexity for non-profit clients selected by the instructor. Student engagement and responsibility from conception through production of the finished product.	4 (0-8-4)

| COMPUTER ENGINEERING |

EGCI 100	Introduction to Computer Engineering Introduction to computer engineering education and profession, computer engineering ethics and code of conduct. Computer systems. Internet and World Wide Web (WWW). Computer security and virus protection. Library and information searching skills. File and data management. Opensource technology. Practical exercises with Office application, Database management application, Linux.	1 (0-2-1)
EGCI 111	Computer Programming Introduction to computer concepts, computer components, hardware and software, hardware and software interaction, 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, introduction to recursion.	4 (3-2-7)
EGCI 200	Engineering Mathematics Prerequisite: ICMA 215 Engineering applications of ordinary differential equations, System of linear differential equations, Mathematical induction; Sequences and series of numbers, Taylor series expansions of elementary functions, Power series solutions of differential equations, Fourier transformation, Laplace transformation, Z transformation, Vector integral calculus, Line integral, Volume integral, Polar coordinate, Calculus of real-valued functions of several variables, Green's theorem, Surface integrals, Divergence theorem of Gauss, Stokes's theorem, Engineering applications.	4 (4-0-8)
EGCI 201	Discrete Mathematics Basic set theory, mathematical reasoning, relations, functions, graphs, trees, introduction to number theory.	4 (4-0-8)
EGCI 202	Numerical Methods for Signal Processing 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; application of numerical methods for engineering problems. Introduction to Digital Signal Processing, Complex variables, Linear time invariant (LTI) systems, Z-transforms and their inverse transforms, Discrete-time Fourier Transforms (DTFT) and their inverse transforms, Fast-Fourier Transform (FFT), Sampling of continuous signals and signal reconstruction, Digital filters, Finite-Impulse Response (FIR) filters, Infinite-Impulse Response (IIR) filters, Multi-rate signal processing, structures for discrete-time systems, and stochastic process.	4 (4-0-8)

EGCI 203	Ordinary Differential Equations Prerequisite: ICMA 215 Complex variables, introduction to ordinary differential equations, linear first order differential equations, nonlinear differential equations, applications of first order equations, linear second order differential equations, applications of second order equations, higher order differential equations, systems of linear equations, matrices, determinants, vector spaces, linear transformations, numerical methods for solving linear algebraic problems, application in science and engineering.	4 (4-0-8)
EGCI 204	Engineering Mechanics Prerequisite: ICNS 132 Force System; resultant; equilibrium; fluid statics; kinematics and kinetics of particles and rigid bodies; Newton's second law of motion.	4 (4-0-8)
EGCI 212	Programming Techniques 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, Recursion, Pointers, Data Structures, Data Abstraction, Analysis of Algorithms, Error Handling, and Object-Oriented Programming Concept.	4 (4-0-8)
EGCI 213	Programming Paradigms Prerequisite: EGCI 111 Introduction to a variety of programming paradigms, programming languages, and language implementations, including object-oriented programming and design, event-driven programming, concurrent programming, and functional programming.	4 (4-0-8)
EGCI 221	Data Structures and Algorithms Prerequisite: EGCI 111 Common data structures and algorithms. Lists, stacks, queues, trees, hash tables. Analysis of algorithms, worst and average case. Algorithms for sorting and searching. Greedy algorithm, divide and conquer, dynamic programming, graph algorithms. Introduction to NP-completeness.	4 (4-0-8)

EGCI 230	Electric Circuit Analysis Circuit elements; Kirchhoff's laws and reference direction; elementary concepts of network graphs; resistive circuits; node and mesh analysis; Thevenin theorem and Norton theorem; first-order and second order circuit; step responses; zero input and zero-state responses; DC transient and AC steady-state response; exponential excitation; elementary transfer functions; periodic waveforms; Fourier series; sinusoidal waveforms; phasor representations; impedance and admittance; sinusoidal steady-state analysis; average power and rms value; polyphase circuit; complex frequency; frequency response	4 (4-0-8)
EGCI 231	Digital Circuit Design Introduction to Switching Theory, 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 Registers, Counter Circuits, Synchronous and Asynchronous Circuits Design, A/D and D/A converters, Memory Organization.	4 (3-2-7)
EGCI 232	Engineering Electronics Prerequisite: EGCI 230 Current - voltage characteristics of electronics devices such as diode, BJT and FET transistors, basic electronic circuits, amplifiers, operational amplifier and its applications in linear and nonlinear circuits, oscillator, power amplifiers and power supply circuits; introduction to power electronic circuits.	4 (3-2-7)
EGCI 252	System Programming Basic concepts of system programming. Fundamental concepts in process management, concurrency and communication, signals, thread, thread synchronization, semaphores, Inter-Process Communication, connection-oriented communication and connectionless communication.	4 (4-0-8)
EGCI 301	Computer Graphics Prerequisite: 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.	4 (4-0-8)
EGCI 304	Computer Aided Analysis and Design Prerequisite: Consent of instructor Algorithms and techniques for computer based electronic circuit designs such as solution of linear equation, solution of non-linear equation and linear transient analysis. Simulation of non-linear circuits.	4 (4-0-8)

EGCI 312	Professional Practices I Software and/or hardware practice in current computer engineering technologies, for example, the use of a modern operating system, operating system programming environment, database management system, and the use of program development tools and networking tools; basic network cabling and installation; small project assignments.	1 (0-2-1)
EGCI 313	Professional Practices II Software and/or hardware practice in current computer engineering technologies, for example, 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.	1 (0-2-1)
EGCI 321	Database Systems Prerequisite: EGCI 221 Data model: entity-relationship, relational. Logical and Physical database design, Query Language, Data Dependencies and Normalization, Transaction, Crash Recovery, Concurrency control, Database security.	4 (4-0-8)
EGCI 330	Microprocessors and Interfacing Prerequisite: EGCI 231 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.	4 (4-0-8)
EGCI 331	Introduction to IC Design Prerequisite: EGCI 231 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.	4 (4-0-8)
EGCI 332	Embedded Systems Prerequisite: EGCI 202 Design and prototype embedded products (PDA, Transaction Terminals, Industrial PC Controller). Processors, chipsets, busses, and I/O devices for high-end embedded systems. Embedded operating systems; device drivers and applications for embedded systems. Customization of programmable logic devices (CPLD and FPGA) with Hardware Description Language (HDL) for optimal implementation of various industrial applications.	4 (4-0-8)

EGCI 333	Computer Architecture Prerequisite: EGCI 252 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; SISD, SIMD, MISD, and MIMD computer architectures. Fault tolerance.	4 (4-0-8)
EGCI 334	Computation Structures Prerequisite: EGCI 231 Integration of computer system and digital circuit design principles. Architectural concepts: software; Boolean algebra; number systems; Combinational datapath, sequential logic, and storage elements. Design, prototype, and test a simple processor, memory control and I/O bus with Hardware Description Language (HDL) and rapid prototyping tools.	4 (4-0-8)
EGCI 341	Software Engineering Software life cycle; need and specification; large-scale software development; scheduling, developing, constructing, testing and maintenance of software system; software standards; object-oriented analysis and design; software reuse; documentation; management of software project; case study of software system in the market.	4 (4-0-8)
EGCI 351	Operating Systems Prerequisite: EGCI 252 Contemporary concepts of computer operating systems; 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.	4 (4-0-8)
EGCI 372	Data Communication and Computer Networks Prerequisite: EGCI 252 Basic principles, fundamental technologies and architectures of data communications and computer networks, signal encoding techniques, digital communication techniques, routing in switched network, congestion control, local area networks and internetwork protocols.	4 (4-0-8)

EGCI 380-389	Special Topics in Computer Engineering Special topics in current computer engineering technologies, which could be offered by other departments. The title of the topic is indicated in the parenthesis of the course title.	4 (4-0-8)
EGCI 390	Engineering Training Practical training in an industrial factory or an organization with computer-related systems, computer control systems, or systems using computer processing. The training, with the minimum period of 100 hours, takes place in the summer semester. Students must present a paper to the department, including the report of the training outcome from the employer.	1 (0-100-50)
EGCI 391-399	Special Topics in Computer Engineering Special topics in current computer engineering technologies, which could be offered by other departments. The title of the topic is indicated in the parenthesis of the course title.	4 (4-0-8)
EGCI 400	Moral and Ethical Studies for Computer Engineers 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.	1 (1-0-2)
EGCI 401	Operations Research Introduction to various methods in operations research for solving engineering problems. Using image model in mathematics, linear algebra, game theory, queuing theory to assist in decision making.	4 (4-0-8)
EGCI 402	Switching Theory Prerequisite: EGCI 231 Introduction to digital system design; numerical system; numerical code; Boolean algebra; design of combination circuit; minimization technique; hazard analysis; flip-flop circuit, analysis and synthesis of sequential circuit.	4 (4-0-8)
EGCI 403	Engineering Management Prerequisite: Consent of instructor An introduction to engineering management; business basics; the business environment; management styles; management of quality; material management; managing design and new product development; organizations; human resource management; communication; costing and pricing; measuring financial performance; project management; inventory management; supply chain management; marketing.	4 (4-0-8)

EGCI 404	Theory of Computation Prerequisite: EGCI 201 Formal models of computation: finite automata and Turing machines, Formal languages. Multiple characterizations of computable partial functions, Universal machines, Church's thesis. Recursion Theorem, Computability theory, Complexity theory. NP-completeness.	4 (4-0-8)
EGCI 405	Mechatronics Prerequisite: Consent of instructor Mechatronic system is an integration of mechanical, electrical, computer and control system engineering. Mechatronic devices such as hard drive or others. Laboratories or projects will be the core of the course. The course covers electronic feedback, power amplifier, digital logic, encoder interfacing, motor control, sensor and real time control.	4 (4-0-8)
EGCI 411	Object Oriented Design Prerequisite: EGCI 111 Abstract data types, concepts of object, class, message method, inheritance, genericity and polymorphism in object-oriented programming languages, object-oriented analysis and modeling, object-oriented design patterns, the use of graphical design notation such as UML (Unified Modeling Language)	4 (4-0-8)
EGCI 412	Introduction to Parallel Programming Prerequisite: EGCI 351 Parallel programming concepts and design. Loop parallelization, parallelizing divide-and-conquer, parallelizing dynamic programming, pipelining. Running parallel jobs. Point-to-point communication, collective communication, synchronization. Basic parallel programming in shared-memory and message-passing styles.	4 (4-0-8)
EGCI 421	Management Information Systems Prerequisite: Consent of instructor Principles of management information systems; structures of management information systems, information technologies, decision-making processes; information concepts, humans in the role of information processors, systems concepts; planning and control concepts, organization structure and management, planning and decision-making support systems; knowledge management systems, requirement specification of information, development, implementation and resource management in management information systems.	4 (4-0-8)

EGCI 422	Electronic Commerce Prerequisite: Consent of instructor E-commerce business models and concepts, E-commerce and web infrastructure, copyright protection, security, on-line payment mechanisms, marketing concepts for retailing on the web. Ethical, social, and political issues in information technologies.	4 (4-0-8)
EGCI 423	Web Database and Information Systems Prerequisite: EGCI 321 Semistructured data models for the Web (such as XML, etc.), semistructured data management, associated query languages and systems for Web data, query processing and optimization over semistructured 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. Some novel data-intensive applications on the Web such as electronic commerce, digital libraries, and distance education as they relate to web database issues.	4 (4-0-8)
EGCI 424	Advanced Topics in Database Systems Prerequisite: EGCI 321 Advanced topics in the area of database systems. Content differs in each offering.	4 (4-0-8)
EGCI 425	Data Mining Prerequisite: EGCI 321 Knowledge discovery in database. Data preparation. Data mining techniques and applications. Association discovery, Classification, Clustering, and Meta-Learning. Knowledge representation. Data warehouse. Online analytical processing (OLAP). Web mining. Current technology and case studies.	4 (4-0-8)
EGCI 426	Knowledge Management Prerequisite: Consent of instructor Foundation of knowledge. Knowledge management life cycle: Knowledge discovery, Knowledge capturing, Knowledge management, and Knowledge transfer. Implementation of knowledge management in organizations. Current technology and trends. Case studies such as wiki, weblog, RSS, and digital library.	4 (4-0-8)
EGCI 432	Distributed Systems Prerequisite: EGCI 351 Distributed operating system and applications: distributed shared memory, object-oriented distributed system design, distributed directory services, atomic transaction, time synchronization, file access, process scheduling, process migration, and remote procedure calls; focusing on distribution, scale, and robustness in the face of failure and security.	4 (4-0-8)

EGCI 433	Introduction to VLSI Design Prerequisite: Consent of instructor Introduction to CMOS technology and circuit design. Implementation of combinational and sequential logic circuit: very large scale integrated circuit design methodologies, CAD tools for layout, simulation and validation. Students design a VLSI chip using CAD tools.	4 (4-0-8)
EGCI 442	Advanced Topics in Software Engineering Prerequisite: Consent of instructor Advanced topics in the area of software engineering. Content differs in each offering.	4 (4-0-8)
EGCI 451	Compilers Prerequisite: EGCI 252 Structure of compilers and interpreters. Programming language; compilation process; lexical analysis; syntax analysis; top-down and bottom-up analysis; semantic flow models; symbol table; runtime memory management; error diagnostic; code optimization and code generation.	4 (4-0-8)
EGCI 452	Advanced Topics in Operating Systems Prerequisite: Consent of instructor Advanced topics in the area of operating systems. Contents differ in each offering. Case base studying and group presentation and discussion of past and contemporary operating systems are the natural learning and teaching methods employed. Some experiments are carried out.	4 (4-0-8)
EGCI 461	Artificial Intelligence Prerequisite: EGCI 201 Foundations of artificial intelligence, solving problems by searching, knowledge representation, first-order logic, inference in first-order logic, planning, probabilistic reasoning systems, learning, communication, image perception.	4 (4-0-8)
EGCI 462	Expert Systems Prerequisite: Consent of instructor Introduction to expert systems, principles of expert systems creation: architecture, knowledge acquisition, programming and tools.	4 (4-0-8)

EGCI 463	Pattern Recognition Prerequisite: Consent of instructor Mask matching, preprocessing for character recognition, binary image processing, thinning, segmentation, features extraction, pattern and textures, classification or linear techniques for recognition, minimum error Bayesian classifiers, formal linguistic methods, structural methods, fuzzy techniques and neural networks applications for pattern recognition, hybrid methods, learning techniques.	4 (4-0-8)
EGCI 464	Voice Recognition Prerequisite: Consent of instructor Review of mathematics for speech recognition, pronunciation and hearing, auditory perception, speech analysis, using of speech coding, linear prediction speech coding, speech synthesis, speech recognition.	4 (4-0-8)
EGCI 465	Fuzzy Sets and Neural Networks Prerequisite: 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.	4 (4-0-8)
EGCI 466	Natural Language Processing Prerequisite: Consent of instructor Develops an understanding of the algorithms available for the processing of linguistic information and the underlying computational properties of natural languages. Morphological, syntactic, and semantic processing from a linguistic and an algorithmic perspective. Focus is on modern quantitative techniques in NLP: using large corpora, statistical models for acquisition, and representative systems.	4 (4-0-8)
EGCI 472	Introduction to Cryptography Prerequisite: Consent of instructor Introduction to basic theory and techniques in cryptography. Symmetric cryptography such as DES and AES. Asymmetric cryptography such as RSA. Diffie-Hellman key exchange algorithm. Data integrity. Hash function. Digital signature and digital certificate. Applications of cryptography in computer security.	4 (4-0-8)

EGCI 473	Computer Security Prerequisite: Consent of instructor Introduction to technologies in computer security, threats, vulnerabilities, attacks. Security engineer: prevention and defense mechanisms, authentication, identification schemes. Security in operating systems, applications and network. Electronic commerce: anonymous cash and micropayment. Electronic commerce security: SSL and SET. Firewall.	4 (4-0-8)
EGCI 474	Internetworking Technologies I Prerequisite: Consent of instructor Theoretical and practical aspects of routing and switching technologies, including internetworking models, internet protocol, routing technologies, switching technologies, virtual local area network and traffic management. Laboratory work is required.	4 (3-2-7)
EGCI 475	Internetworking Technologies II Prerequisite: EGCI 474 Theoretical and practical aspects of advanced routing and switching technologies, including Advanced IP Addressing, Advanced Routing, Multicast Routing, IPv6, Advanced Spanning Tree Concepts, Inter-VLAN Routing, Gateway Redundancy Technologies, Wireless Client Access, Voice over IP Concepts, and Security in a Switched Network. Laboratory work is required.	4 (3-2-7)
EGCI 481	Digital Signal Processing Prerequisite: Consent of instructor Discrete time signals and systems: Fourier and Z transforms, DFT, 2-dimensional versions. Digital signal processing topics: flow graphs, realizations, FFT, chirp-Z algorithms, Hilbert transform relations, quantization effects, linear prediction. Digital filter design methods: windowing, frequency sampling, S-to-Z methods, frequency-transformation methods, optimization methods, 2-dimensional filter design.	4 (4-0-8)
EGCI 486	Image Processing Prerequisite: 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.	4 (4-0-8)

- EGCI 491** **Project Seminar** **1 (0-2-1)**
Prerequisite: Consent of instructor
Special seminar and discussion on current topics in computer engineering, supervised by the faculty. Research and/or implement a simple test case to propose and discuss in the meeting. 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)**
Prerequisite: EGCI 491
The computer engineering project supervised by the faculty. Students complete the project. A complete project report and an oral examination is required.

| COMPUTER SCIENCE |

ICCS 199	Computer Concepts and Fundamentals The preliminary computer course for students entering the Computer Science major to provide infrastructures for further study; broad overview on the following issues: major fields of computer science, major components of a computer system, operating systems, problem solving, UML diagrams, fundamentals of programming, and computer ethics.	4 (4-0-8)
ICCS 201	Computer Programming I Prerequisites: ICCS 199 Fundamental principles of computer programs, programming languages from various paradigms and programming languages as tools for problem solving; object-oriented programming: classes and objects, message passing, inheritance, encapsulation, and polymorphism in Java, casting, exception handlings; Java packages; code documentation; using debuggers.	4 (3-2-7)
ICCS 203	Computer Programming II Prerequisite: ICCS 201 Solid basis on object-oriented program design; development of comprehensive text-based applications, GUI-based applications, multi-tasking applications, network applications, and Internet-oriented programs in the context of Java programming language and UML standard.	4 (3-2-7)
ICCS 204	Introduction to Digital Electronics Prerequisite: ICPY 211 Digital arithmetic, number systems, binary and hexadecimal base codes and logic; Boolean algebra; the Karnaugh map simplification; digital electronic circuits: logic gate, flip flop, combinational circuits, data representation, code conversion, gate minimization; hardware realization and interfacing technique.	4 (4-0-8)
ICCS 207	Introduction to File Processing Prerequisite: ICCS 321 Records and files, database management systems, data structures, random access and file manipulation, file I/O, characteristics of physical files and storage devices, selection of file organization under various criteria; practical exercises included.	4 (4-0-8)
ICCS 208	Computer Logic Prerequisite: ICCS 204 Number systems; digital logic circuit: Boolean algebra, map simplification, logic gates, combinational circuits; flip-flops: data representation, code conversion, gate minimization, Mealy/Moore machine; practical exercises included.	4 (4-0-8)

ICCS 281	Advanced Mathematics for Computer Science Prerequisite: ICMA 212 First order differential equations and their applications, fundamental solutions of the homogeneous second order equation, linear independence, higher order linear equation.	4 (4-0-8)
ICCS 306	Numerical Methods I Prerequisite: ICCS 201 Computational methods, solution of non-linear equations and systems of linear equations, approximated differentiation and integrating, numerical solution of ordinary differential equations, curve fitting.	4 (4-0-8)
ICCS 311	Compilers Prerequisites: ICCS 321, ICCS 325 Preliminary elements of modern compilers; BNF notation, syntax and semantics of formal grammars, scanners and parsers; programming assignments to reinforce theory; a consecutive study of modern compilers; parsers, code generation and code optimization; practical exercises included.	4 (4-0-8)
ICCS 312	Human Computer Interaction Prerequisite: ICCS 365 Concept of task analysis; absence of relevant design formalisms; cognitive basis of proposed interaction taxonomy; notion of self-explanatory tools; use of AI techniques in HCI; interdisciplinary complexities of both practical and theoretical aspects of HCI.	4 (4-0-8)
ICCS 315	Operating Systems Prerequisite: ICCS 321 Definition of functions and components of operating systems; survey of contemporary multiprocessing / multiprogramming systems; exploration of systems programs: their design, internal structure and implementation; CPU scheduling, hierarchical and virtual memory management; advanced topics in operating systems, performance measurement and evaluation and design of operating system modules; practical exercises included.	4 (4-0-8)
ICCS 316	Computer Architectures Prerequisites: ICCS 201, ICCS 208 Stored procedure concept, digital computer architecture, logical control, processor, arithmetic unit, I/O channels, cache and pipelining, machine structures, system interfaces, large computer systems architectures; practical exercises included.	4 (4-0-8)

ICCS 321	Data Structures and Algorithm Analysis Prerequisite: ICCS 201 Basic data structures, storage allocation, design and evaluation of algorithms for manipulating data structures, data structure in programming languages, criteria for selecting data structures to fit their applications; practical exercises included.	4 (4-0-8)
ICCS 322	Microcomputer Systems and Interfacing Prerequisites: ICCS 201, ICCS 204 Microcomputer organization; 8-bit, 16-bit and 32-bit microprocessors; microcomputer software, operating systems and application programs; interfacing concepts; microcomputer to mainframe links; practical exercises included.	4 (3-2-7)
ICCS 323	Computer Data Communication Prerequisites: ICCS 199, ICPY 211 Basic communication theory, principal components of data communications and networks, local area networks, network protocols and line control procedures, communication carrier facilities, system planning and network design.	4 (4-0-8)
ICCS 324	Discrete Structures Prerequisite: ICNS 102 Applied modern algebra with specific attention to applications in computer science; topics include logic, set algebra, equivalence relations and partitions, functions, mathematical induction, elementary number theory, basic combinatorial method, trees and graphs, finite state machines.	4 (4-0-8)
ICCS 325	Theory of Computation Prerequisite: ICCS 324 Turing machine, Post machine, Post's theorem, Minsky's theorem; determinism and non-determinism; undecidability, the halting problem; recursive function theory.	4 (4-0-8)
ICCS 331	Organization of Programming Languages Prerequisite: ICCS 321 Language definition structure; programming language processors; data types and structures; control structures and data flow; storage management; syntax and translation; operating and programming environments; programming languages such as FORTRAN, PASCAL, COBOL, C, LISP; comparison.	4 (4-0-8)

ICCS 332	Image Processing and Visualization Prerequisite: ICCS 321 <p>This course introduces a range of state-of-the-art techniques in the fields of imaging and visualization. The ‘information revolution’ has generated large amounts of data, but valuable information is often hidden and hence unusable. Visualization techniques seek to provide graphical answers to questions such as “How does the data look?”, “What structures are there?” or “What model should be used?”. Imaging techniques include the generation of realistic models, such as fractal models of landscapes. The module includes some practical work.</p>	4 (4-0-8)
ICCS 365	Information Systems Analysis and Design Prerequisite: ICCS 201 <p>Information system development strategies; problem identification and feasibility studies; object oriented analysis and design; practice on the real systems by applying the theory; practical analysis and design the computerized system in an organization.</p>	4 (4-0-8)
ICCS 366	Management Information Systems Prerequisites: ICCS 365, ICCS 411 <p>Design, development, applications, and organizational impact of Management Information Systems (MIS) and Decision Support System (DSS) from the managerial perspective; assessing information needs; sources, organization, characteristics and users of data; database and file management systems; evaluating information systems effectiveness and efficiency.</p>	4 (4-0-8)
ICCS 367	Design Patterns Prerequisite: ICCS 365 <p>This course is an introduction to design patterns covering the rationale and benefits of object-oriented design patterns. Examples will be used to scrutinize the development of good design patterns. This course will discuss in specific patterns, such as Observer, State, Adapter and Abstract Factory. Furthermore, distributed object frameworks, such as RMI and Jini, will be studied for their effective use of design patterns.</p>	4 (4-0-8)
ICCS 371	Internship in Computer Science Prerequisite: Juniors <p>Junior students are required to take an internship in Computer Science with a company under the industry guidance of a staff member for a period of 300 working hours during the summer session in order to extend their classroom knowledge and gain direct practical experience in the computer industry.</p>	2 (2-0-4)

ICCS 398	Special Topics in Computer Science I Prerequisite: Topic dependent Topic(s) from various areas of computer are chosen according to students' interest.	4 (4-0-8)
ICCS 406	Numerical Methods II Prerequisite: ICCS 306 Numerical solution of ordinary differential equations; analysis of truncation, discretization and rounding errors; stability; numerical solution of boundary value problems; computation of eigen values and vectors numerical solution of partial differential equations; practical exercises included.	4 (4-0-8)
ICCS 411	Database Management Systems Prerequisites: ICCS 321 Development of relational database systems: data modeling, conceptual database design principles, Structure Query Language programming, model transformation, schema normalization based on functional dependencies and first to fifth normal forms, transactions, concurrency control, recovery, distributed database; introduction to industry-leading database management systems; development of actual databases.	4 (4-0-8)
ICCS 412	Distributed Database Systems Prerequisites: ICCS 323, ICCS 411 Distributed database system concepts and architectures; databases and computer networks, principles of distributed database design, the management of distributed transactions, concurrent control, fallibility, distributed database administration; practical exercises included.	4 (3-2-7)
ICCS 413	Data Warehousing and Data Mining Prerequisite: ICCS 411, ICCS 365 Data warehouse modeling and implementation; data extraction, cleansing, transformation and loading, data cube computation, materialized view selection, OLAP query processing. For Data Mining includes fundamentals of data mining process and system architecture, relationship of data mining with data warehouse and OLAP systems, data pre-processing, mining techniques and application: association rules, mining sequence and time-series data, text mining.	4 (4-0-8)
ICCS 414	Information Storage and Retrieval Prerequisites: ICCS 207, ICCS 321 Advanced data structures, file structure databases, key decoding by tree and Rainzd techniques, document retrieval and question and answering systems, algorithms and techniques for automatic classification and storage of documents.	4 (4-0-8)

ICCS 415	Computer Graphics Prerequisite: ICCS 321 Mathematical concepts for graphics, line drawing algorithms, clipping algorithms, polygon filling algorithms, physical and logical input and output devices, graphical standard for software, data structures for graphics; space curves, surfaces in three dimensions, hidden line and hidden surface algorithms, illumination models, rendering techniques, color and ray tracing; practical exercises included.	4 (3-2-7)
ICCS 416	Knowledge Management Prerequisite: ICCS 411 Concepts and definitions of knowledge and knowledge management, organizational issues and knowledge management, management of intangible assets and intellectual capital; managing organizational knowledge and knowledge processes complex nature of knowledge in organizations; development of skills to analyze, understand and implement knowledge management practices in organizations.	4 (4-0-8)
ICCS 421	Computer Networks and Distributed Processing Prerequisite: ICCS 323 Types of computer networks; logical, virtual and transparent facilities; layers of control; physical link control; network management; standard and CCITT recommendations; network mechanisms; HDLC, SDLC; packet switching; X.25; distributed processing and distributed databases; security and privacy; practical exercises included.	4 (3-2-7)
ICCS 425	Algorithms Prerequisite: ICCS 321 Classification of algorithm, data structures, combinatorics, sorting, the spanning tree algorithm, traversing graphs and digraphs, string matching, the Knuth-Mouies-Prat algorithm, evaluating polynomial functions, the fast Fourier transform and convolution, dynamic programming; practical exercises included.	4 (4-0-8)
ICCS 426	Advanced Data Communications Prerequisite: ICCS 323 LAN concepts, topologies and MAC layer protocols; network sharing techniques; LAN systems; ISO-OSI model; sliding window protocol Distributed Computing; gateways and internetworking; TCP/IP and Internet; network performance analysis for multimedia application; practical exercises included.	4 (3-2-7)

ICCS 427	Enterprise Networking Prerequisite: ICCS 323 Data networking; TCP/IP protocol suite; routing protocols; IP networking technologies at core; distribution and access layers; IP Quality of Service; wireless networks; commercial network services; network design method; network management and security; hands-on workshops of practical network configurations within a Network Operation Center-like environment, equipped with the sets of real industry-leading network equipment: Ethernet cabling, router and switch configuration basics, routing protocols (Static, routing and Frame relay).	4 (4-0-8)
ICCS 428	Object - oriented Concepts Prerequisite: ICCS 321, ICCS 365 Object - oriented architecture, the basics of object oriented programming, inheritance polymorphism and encapsulation, programming tools, class libraries and application frameworks.	4(4-0-8)
ICCS 429	Microprocessor Concepts and Applications Prerequisite: ICCS 204 The evolution of microprocessor, various microprocessor architecture and functions; the study of typical 8, 16, and 32 bit microprocessors as well as different kinds of commercially available microprocessors and their application; practical exercises included.	4 (3-2-7)
ICCS 431	Software Design and Development Prerequisite: ICCS 365 Planning a software project; software cost estimation; software requirement definition; structured system analysis; software design, implementation, verification, validation techniques, and maintenance; practical exercises included.	4 (4-0-8)
ICCS 432	Software Engineering Project Management Prerequisite: ICCS 365 Management of the software development process: how projects arise, choosing the right project, software life cycles, human factors in project management, basic project management techniques including planning, estimating, monitoring progress, advanced project management techniques (e.g. risk management, configuration management, quality management, process improvement). Fundamentals of requirements engineering, requirements elicitation and analysis, requirements definition and specification, requirements validation, requirements management, overview of specification techniques.	4 (4-0-8)

ICCS 433	Network Analysis Prerequisite: ICCS 323 Standard network protocol operations; systematic analysis approach; network troubleshooting techniques; efficient network design practices; network efficiency optimization; practical insights of Local Area Network protocols and their implementations as well as the common Internet-scale protocols; hands-on practiced with standard network analysis tools and techniques; development of the understandings of further network-related topics such as networked application development, implementations and administrations of system and network infrastructures, and network security.	4 (3-2-7)
ICCS 434	Computer Security Prerequisites: ICCS 323, ICCS 411 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.	4 (4-0-8)
ICCS 435	Database System Development and Analysis Prerequisite: ICCS 411 Utilizing various DBMS and development tools; exploring the mainstream DBMS used today, ie. Oracle, Informix, Power Builder, etc.	4 (4-0-8)
ICCS 436	Operating Systems Analysis Prerequisite: ICCS 315 Utilizing various operating systems; exploring the mainstream operating systems used today, ie. Windows NT, UNIX, Linux, etc.	4 (4-0-8)
ICCS 441	Business Application Programming Prerequisites: ICCS 411 Focus on how to adapt existing business application to changes in business requirements; introduction to some of the widely recognized business application programming along with the standard industry implementation methodology; application includes but is not limited to ORACLE financial management system, SAP R3, Informix Web tools.	4 (3-2-7)

ICCS 442	Decision Support System Prerequisite: ICCS 411, ICCS 365 Discussion of the Decision Analysis Process to provide insights into the entire decision situation, which is much more than obtaining just a numeric answer; focus on how a DSS can be used in the formulation phase, the evaluation phase, the appraisal phase, the interaction between the decision-maker and the decision analyst, and the Deterministic and Probabilistic cycles found within the process.	4 (4-0-8)
ICCS 451	Artificial Intelligence Prerequisite: ICCS 321 Understanding the basic techniques for building intelligent computer systems, LISP and PROLOG programming languages, symbolic computation and problem solving, search strategies, game playing, theorem proving, learning, natural language processing, heuristic programming, expert systems.	4 (4-0-8)
ICCS 452	Intelligent Robotics Prerequisites: ICCS 316, ICCS 321 This course deals with artificial intelligence that is concerned with mechanisms for generating intelligent behavior. When this behavior occurs in the everyday physical world, with its uncertainty and rapid change, we find that all kinds of new problems and opportunities arise. We will try to understand some of these in the context of robotics. In a series of lectures we will look at some theories of how to sense the real world, and act intelligently in it. In a series of labs you will build your own robots to see how well (or badly) these theories actually work.	4 (4-0-8)
ICCS 453	Machine Learning Prerequisite: ICCS 321 This course will provide a good foundation in machine learning. It will compare and contrast human learning with machine learning. It will examine the limitations of machine learning, the role of hypothesis bias and hypothesis representation.	4 (4-0-8)
ICCS 454	Natural Language Processing and Applications Prerequisite: ICCS 321 This course will cover: levels of NLP, speech (phonetics, phonology); grammar (morphology, syntax); meaning (semantics, pragmatics); applications (text-to-speech, speech-to-text, parsing, MT, NL interfaces). The emphasis will be on the background needed to understand practical applications of speech and natural language processing.	4 (4-0-8)

ICCS 455	Virtual Reality Prerequisites: ICCS 315 , ICCS 316 This course introduces the concepts of virtual reality, using Virtual Reality Modeling Language (VRML) and enables the students to gain hands-on experience by developing their own applications.	4 (4-0-8)
ICCS 473	Technology of Computer Center Management Prerequisite: ICCS 365 Planning; organizational structure and management control; hardware and software acquisition; computer center processing; standards and procedures; workflow, job scheduling and resource allocation; data communication; performance evaluation.	4 (4-0-8)
ICCS 474	Internet Programming Prerequisites: ICCS 201, ICCS 323 Learning to develop application on the Internet including the WEB based applications; concepts of Internet specific application along with development tools; students must develop simple Internet based application.	4 (3-2-7)
ICCS 476	Internet Enterprise Design and Development Prerequisite: ICCS 365 Discussion of the why, what, and when businesses start the Internet Enterprise, including the tools used to create and channel information, along with techniques of doing this; ways to design and organize content; how to develop an Internet presence, selecting vendors, securing a domain name and its trademark, and selecting an ISP; students will be expected to develop a complete web-site.	4 (3-2-7)
ICCS 477	System Simulation Prerequisites: ICSC 303, ICCS 365 Mathematical modeling of systems, stochastic processes, analytical and discrete-event simulation models, verification and validation procedures, programming techniques, special purpose simulation languages, simulation experiments.	4 (4-0-8)
ICCS 478	Pattern Recognition Prerequisites: ICSC 303, ICCS 321 Artificial Intelligence; statistical decision theory, pattern recognition and image processing; pattern classification techniques, adaptive classifier; feature selection methods; learning algorithms; the syntactic approach; decision problems; visual and speech recognition machines.	4 (4-0-8)

ICCS 479	Electronic Commerce Prerequisites: ICCS 323, ICCS 365 Learning how e-commerce is being used in today's business environment; concepts such as the history of credit, the emergence of e-commerce, relationships between e-commerce, banking and the organization, e-commerce and the value chain, and payment systems; a comparison between e-commerce and traditional business practices, organizational support systems, developing a strategy for e-commerce, business on the Internet, data encryption and global difficulties in implementing e-commerce.	4 (4-0-8)
ICCS 497	Seminar in Computer Science Prerequisite: Seniors Each student is required to give presentation on a topic of his/her interest in the area of Computer Science, preferably one related to the student's senior project, and to prepare a report on the topic	2(2-0-4)
ICCS 498	Special Topics in Computer Science II Prerequisite: Seniors (Topic independent) Advanced topic(s) from various areas of computer are chosen according to students' interest.	4 (4-0-8)
ICCS 499	Senior Project in Computer Science Prerequisite: Seniors Small research project in Computer Science and related fields under the supervision of an advisor; learning to investigate a research problem and submit a report; required before graduation.	4 (0-8-4)

| ENGLISH COMMUNICATION |

ICCM 104	Intermediate English Communication I Prerequisite: Placement exam or completion of ICME 100, English Resource Skills (ERS), with the grade of "S" Improvement in reading and writing; reading material: academic essays, short stories and a novel; rhetorical patterns: narration, description, illustration, process and comparison and contrast.	4 (4-0-8)
ICCM 105	Intermediate English Communication II Prerequisite: "C" or better in ICCM 104, Intermediate English Communication I, within the previous 2 trimesters Rhetorical patterns of classification, cause and effect and argumentation; more diverse and challenging readings; writing a research paper.	4 (4-0-8)
ICCM 106	Intermediate English Communication III Prerequisite: a "C" or better in ICCM 105 within the previous two trimesters. Review of the rhetorical patterns in public speaking form; presentation of speeches of diverse structure to fit different contexts, both individually and in groups; engaging in a full-scale debate.	4 (4-0-8)
ICCM 111	Advanced English Communication I Prerequisite: Placement exam Introductory course for native speaker; four major areas of communication: reading, writing, speaking and listening; emphasis placed on vocabulary, proper syntax, and critical thinking skill; essays on the rhetorical forms of process, comparison and contrast; development and delivery of speeches.	4 (4-0-8)
ICCM 112	Advanced English Communication II Prerequisite: Completion of Advanced English Communication I with a grade of "D" More advanced class materials in the areas of communication; readings with written critiques; assignments: journals, research paper and debate.	4 (4-0-8)
ICCM 202	Exploring Global Realities Prerequisites: "C" or better in ICCM 106 or "D" or better in ICCM 112 within the previous two trimesters. Contemporary issues; critical/analytical writing, oral presentations based on class materials and research; assignments; portfolio, debated and term paper.	4 (4-0-8)

- ICCM 203** **Introduction to Literary Analysis** **4 (4-0-8)**
Prerequisite: “C” or better in ICCM 106, Intermediate Communication III; or “D” or better in ICCM 112, Advanced English Communication II, within the previous 2 trimesters
Selected literary genres: short story, novel, poetry and drama; assignments: portfolio, debate, and term paper. (This course or ICCM 204 is required for English majors/ minors)
- ICCM 204** **Creative Writing** **4 (4-0-8)**
Prerequisite: “C” or better in ICCM 106, Intermediate Communication III; or “D” or better in ICCM 112, Advanced English Communication II, within the previous 2 trimesters.
Recommended : “B” or better in ICCM 105
Examination of fiction, poetry, drama and media production; introduction and practice writing in different genres; publication of a small literary magazine for MUIC. (This course or ICCM 106 is the required choice for English major/ minors.)

Note I: All 4 General Education English Communication classes must be completed on schedule (i.e. ICCM 104 and ICCM 105, ICCM 106 and one elective class at the 200 level) or students may be asked to retake.

Note II: Students may also select ICEG 232 or ICEG 250 to meet the EC IV requirement.

| ENGLISH STUDIES MINORS |

ICEG 232	<p>Advanced Oral Communication</p> <p>Recommended : "B" or better in ICCM 106</p> <p>Theories of persuasion, non-verbal techniques and voice control for advanced presenters, including study of film clips, debate strategies, stage and sales presentation.</p>	4 (4-0-8)
ICEG 243	<p>Belief Systems in English Usage</p> <p>Norse, Greek and other mythologies the Bible and the Arthurian Cycle as they affect the use of the English language in both spoken and written forms, understanding of connotative allusions to expand their cultural literacy and decoding / encoding skills.</p>	4 (4-0-8)
ICEG 250	<p>Introduction to Linguistics</p> <p>Introduction to the major characteristics and components of human language focusing on the power and complexity of language, its influence on interactions and its contributions to understanding; a definition of and lectures on syntax, semantics, pragmatics, and other topics in the field.</p>	4 (4-0-8)
ICEG 265	<p>Literature into Film</p> <p>Poems, plays, stories and novels that have been turned into movies; discussions of the difference imposed by the printed word and cinema in shaping the same material into different artistic expressions; analysis of typical film such as Ishiguro's Remains of the Day or Tennessee William's A Street Car Named Desire.</p>	4 (4-0-8)
ICEG 342	<p>Diverse English Speaking Cultures</p> <p>The new millenium's blending of backgrounds and ethnicities from the perspectives of language and literature; selected readings from writers representing a variety of English speaking cultures across the world; discussion and compositions about specific themes such as identity, prejudice, the individual and society, and gender roles as they are embodied across these cultures.</p>	4 (4-0-8)
ICEG 344	<p>Language and Culture</p> <p>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.</p>	4 (4-0-8)

ICEG 353	Linguistic Interaction and communication Theory Examination of various aspects of linguistic communication; conversational maxims, politeness, metaphor, discourse structure, message models, system theories, social interaction, and other related topics.	4 (4-0-8)
ICEG 355	The Story of English Development of English from its Indo-European origins to contemporary varieties and dialects; changes and growth in structure and vocabulary, depending on time and place; viewing of the Public Broadcasting Service production and selection from other media.	4 (4-0-8)
ICEG 360	Literature for Children and Young Adults Survey of the genre of literature for the young, noting the style, technique and methods used in this specialized genre; selected readings from diverse authors such as Ursula Le Guin, Maya Angelou and E. B. White. (recommended for primary school teachers).	4 (4-0-8)
ICEG 425	Advanced Rhetoric The study of and practice with expository and persuasive prose; investigation of methods of invention, form and style; workshops and tutorials providing guidance for students to form a personal style, editing and redrafting prose for research or publication; tutoring in the Resource Center (under guidance) to assist EC I, EC II and EC III students.	4 (4-0-8)
ICEG 461	Topics in Comparative Literature A: Poetry In-depth study of poetry, including metrics, forms, themes, eras, ethnic voices, bilingual verse throughout history.	4 (4-0-8)
ICEG 462	Topics in Comparative Literature B: Short Story and Novel Analysis of key themes, motifs and principles which integrate philosophy, psychology, politics, sociology and the history of ideas with literature around the world.	4 (4-0-8)
ICEG 463	Topics in Comparative Literature C: Drama Examination of historical perspectives, movements, forms and major playwrights from different cultures, languages and historical periods.	4 (4-0-8)
ICEG 484	First and Second Language Acquisition Past and present theories emphasizing the comparison of first and second languages; learning acquisition (Krashen), competence and performance (Hymes), language universals (Chomsky) and cognitive varieties in language learning.	4 (4-0-8)

ICEG 485	Teaching Methodology A: Basic to Lower Intermediate Students Overview of the theory and practice of teaching English to beginner students; various methodologies and their theoretical underpinnings; emphasis on listening/speaking, teaching children, teaching young adults, teaching adults, classroom management, materials design and evaluation, and construction and evaluation of tests; student-centered activity-based instruction.	4 (4-0-8)
ICEG 486	Teaching Methodology B: Upper Intermediate to Advanced Students Prerequisite: ICEG 485 Overview the theory and practice of teaching English to advanced students; various methodologies and their theoretical underpinnings; teaching emphasis on reading/writing, teaching children, teaching young adults, teaching adults, classroom management, materials design and evaluation, and construction and evaluation of tests; lecture listening/notetaking and more academic reading and writing skills.	4 (4-0-8)
ICEG 490	Senior Project Design and completion of a project in the field of English Studies, supervised by at least one instructor and the English Program Director; for students who select the English Teaching Preparation track, an optional practicum in teaching English.	4 (4-0-8)

| ENTERTAINMENT MEDIA |

ICEM 101	Media Production Introduction to the modern entertainment industry, world wide: study of the production process of mass media from an historical point of view, concentrating on the moving image (movies and tv); roles of the media producer throughout over the history of modern mass media disseminated via moving images.	4 (4-0-8)
ICEM 104	Visual Communication I Study of basic visual components used in the process of communication. Images are analyzed so as to understand the relation between the visual elements and their impact on the viewer's perception. The content covers both still and moving pictures. The course then looks at how the social, cultural, and aesthetic factors in the images affect the perception of the viewers. Students will also learn to write words to complement pictures.	4 (4-0-8)
ICEM 105	Visual Communication II This course aims to develop the skills of pre-visualization which will be used as the blueprint for subsequent productions in general. Students will also learn to produce drawings and perspective sketches in order to communicate the ideas to other people	4 (4-0-8)
ICEM 202	Storytelling The fundamentals of storytelling: elements and structure of a story; narrative techniques.	4 (3-2-7)
ICEM 204	Audio Communication The emphasis is on using sound to complement the images in the process of communication. The course will explore the meaning and the feeling that the audience perceive from various kinds of sound, including music. Students also learn how to use audio equipments that suit the purposes and the existing conditions.	4 (2-4-6)
ICEM 205	Basic Acting Techniques Body control and voice training, movements and blockings, together with physical and mental exercises are the key contents of this course. Script interpretation for performers is also covered.	4 (2-4-6)
ICEM 301	Introduction to Media Research Various approaches to media research; methods of framing key questions and procedures of conducting media research; tools and techniques for gathering, organizing, and analyzing data.	4 (4-0-8)
ICEM 302	Media Law and Ethics Laws and regulations as well as ethical practices relevant to the media industry; case studies will be examined to appreciate the implication/ application of related law.	4 (4-0-8)

| ENVIRONMENTAL SCIENCE |

ICEN 211	Fundamentals and Applications of Environmental Microbiology 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; roles and relation of microorganisms to the environment; roles of microorganisms related to biodegradation of environmental contaminated substances; practical exercise included.	4 (3-2-7)
ICEN 212	Ecological Systems Analysis 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.	4 (4-0-8)
ICEN 241	Environmental Pollution I Prerequisite: ICCH 210 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.	4 (4-0-8)
ICEN 301	Basic Environmental Statistics Prerequisite: ICSC 303 Basic probability and statistics, elementary sampling and monitoring, statistical inferences for means and proportions, detecting and estimating trends, regression and non-parametric statistics, all relate to environmental application.	4 (4-0-8)
ICEN 312	Environmental Toxicology Prerequisite: ICEN 241 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.	4 (4-0-8)
ICEN 313	Clean Technology and Waste Utilization Reduction or elimination of waste production; reduction in pollution at source, the changes in procedure, technology and material input; economic production process; significance and application of waste minimization or cleaner technology; practical exercises included.	4 (4-0-8)

ICEN 314	Tropical Ecology 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 included.	4(3-2-7)
ICEN 317	Aquatic Ecology 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 included.	4(3-2-7)
ICEN 318	Aquatic Ecology Field Course Prerequisite: ICEN 317 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.	4 (0-8-4)
ICEN 319	Conservation Biology 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, reducing and management of endangered species, social and ethical issues in conservation.	4(4-0-8)
ICEN 320	Population and Community Ecology Prerequisite: ICEN 351 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 included.	4(3-2-7)
ICEN 331	Soil, Land Use and Degradation A basic introduction to soil science; its relationship to land resource management and the environment; soil problems and their solutions.	4(4-0-8)
ICEN 332	Introduction to Oceanography History of oceanography; introduction to the earth and geomorphology; 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 trip with practical exercises included.	4(3-2-7)

ICEN 341	Environmental Quality Analysis I Prerequisite: ICEN 241 Basic knowledge; the importance and the analysis of representative samples; analysis for 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.	4 (2-4-6)
ICEN 342	Environmental Pollution II Prerequisite: ICEN 241 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; the application of radioactivity, and management of radioactive waste.	4(4-0-8)
ICEN 343	Environmental Quality Analysis II Prerequisites: ICEN312, ICEN342 Practices on environmental quality monitoring concerning soil analysis, solid waste, air and noise pollution, as well as toxicity testing; data sampling; sample preservation and sampling analysis; data evaluation.	4 (2-4-6)
ICEN 351	Population and the Environment An introduction to demography; population growth; fertility, mortality and migration; social and economic factors; population and its impact on the environmental system.	4(4-0-8)
ICEN 352	Environmental and Resource Economics Basic economic theories including market failure, externality and common right problem 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.	4(4-0-8)
ICEN 361	Principles of Environmental Impact Assessment Prerequisites: ICEN 311, ICEN 312 Environmental changes and its impact on communities; environmental impact analysis, statement techniques, assessment methodology, tools such as EIA (Environmental Impact Assessment) for environmental planning and decision making.	4(4-0-8)

ICEN 362	Natural Resource Conservation and Management 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.	4(4-0-8)
ICEN 391	Sustainable Development Sustainable development: 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.	4(4-0-8)
ICEN 392	Environmental Issues: Past, Present and Future 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; contemporary and likely future environmental issues.	4(4-0-8)
ICEN 393	Practical Training in Environment 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.	2 (0-4-2)
ICEN 401	Applied Mathematics for Environment Studies 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.	4(4-0-8)
ICEN 402	Geoinformatics The figure and rotation of the earth, great circles, latitude-longitude and time; introduction to marginal information, map symbol, scale ratio, direction, elevation and relief, position, measurement, and map projection; 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.	4(3-2-7)
ICEN 403	Principles of Environmental Informatics Introduction to principles of information technology implementation in environmental study and management, the information technology applications for environmental data manipulation and management, basic principles of the integrated information technology for sustainable environmental management.	4(4-0-8)

ICEN 411	Climate Change and Its Impact 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.	4(4-0-8)
ICEN 413	Environmental Remediation Technology 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 affecting remediation technologies; criteria to select appropriate environmental remediation technology; sites selection; basic experimental design.	4 (4-0-8)
ICEN 414	Waste Utilization Characteristic, composition 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.	4(4-0-8)
ICEN 415	Biodiversity 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.	4(4-0-8)
ICEN 416	Ecotoxicology Prerequisite: ICEN 312 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.	4(4-0-8)
ICEN 421	Water and Wastewater Treatment Principles 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.	4 (4-0-8)

ICEN 422	Solid and Hazardous Wastes Management 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 and treatment processes, recycling, remediation	4 (4-0-8)
ICEN 431	Land Use and Urban Environmental Planning Prerequisite: ICEN 331 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.	4 (4-0-8)
ICEN 432	Global Geomorphology 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.	4 (4-0-8)
ICEN 441	Occupational Health and Safety 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.	4 (4-0-8)
ICEN 460	Ecotourism 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.	4 (2-4-6)
ICEN 461	Energy Conservation and Development 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.	4 (4-0-8)

ICEN 462	Coastal and Marine Resources Coastal areas or coastal zones; coastal utilization, impacts on coastal ecosystems, regulations and laws as well as the principles for coastal conservation and managements.	4 (4-0-8)
ICEN 464	Water Resources Management Prerequisite: ICEN 362 Understanding the processes in the hydrologic cycle that includes 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.	4 (4-0-8)
ICEN 465	Resource Inventory and Baseline Studies Methods 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 included.	4 (3-2-7)
ICEN 466	Environmental Management Systems Prerequisite: ICEN 362 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.	4 (4-0-8)
ICEN 467	Environmental Risk Assessment and Management 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.	4 (4-0-8)
ICEN 468	Environmental Management Policy Prerequisites: ICEN 362 or ICEN 466 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.	4 (4-0-8)

ICEN 469	Heritage Conservation 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.	4 (2-4-6)
ICEN 483	Physical Planning and Environment 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	4(4-0-8)
ICEN 491	Seminar in Environmental Science 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, etc.	2 (2-0-4)
ICEN 492	Environmental Field Excursions On-site study emphasizes 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 environmental and resource management; case studies.	2 (0-4-2)
ICEN 496	Senior Project in Environmental Sciences Independent study on a research project in environmentally related field under the supervision of an advisor; planning and conducting a good research work; data analyzing and interpretation; scientific writing and presentation.	6 (0-12-6)

| FILM PRODUCTION |

ICFM 101	Film Production Prerequisite: ICEM 101 Technical and artistic principles of feature film production; pre-production and production practice in filmmaking: budgeting, scheduling, shooting protocol, casting, hiring crew; production crew's duties as well as scope of work.	4 (0-8-4)
ICFM 102	Introduction to Film Prerequisite: ICEM 101 Introduction to film: history of cinema; genre; narrative; cinematography: visual and audio components, and editing; Hands-on practice in cinematic communication.	4 (1-6-5)
ICFM 201	Cinematography Prerequisite: ICHM 143 Technical standards of cinematography in feature films: principles and methods of visualization; use of camera movement; lens selection; lighting techniques; basic film manipulation.	4 (0-8-4)
ICFM 202	Film Analysis Prerequisite: ICFM 102 Study of feature films: plot, narrative structure and codes; cinematography, mise en scene, editing, and sound; study of three main genres, such as action, horror, and drama.	4 (2-4-6)
ICFM 203	Scriptwriting for Film Prerequisite: ICEM 202 Standard elements of a film script: theme, plot, character, dialogue, premise, and treatment; developing and writing a script; standard format of a film script.	4 (1-6-5)
ICFM 204	Film Post-Production I Prerequisite: ICFM 101 Introduction to the technical requirements in film post-production: elementary film laboratory procedures, editing process, visual effect techniques, sound post-production, and digital surround sound system.	4 (0-8-4)
ICFM 251	Music Video Production The principles of music video production: aesthetics and technology; introduction to the stages involved in producing a music video.	4 (0-8-4)

ICFM 301	Acting for Film Prerequisite: ICEM 103 Introduction to acting in feature films: actors' needs, resources and training; acting methods; problems and solutions; working on the set.	4 (0-8-4)
ICFM 302	Film Directing Prerequisites: ICFM 101, ICFM 201, ICFM 203 Artistic and technical craft of film directing: script analysis, rehearsal, blocking, developing storyboards and shot list, director's collaboration with production crew, working with actor(s) on set.	4 (0-8-4)
ICFM 303	Advanced Film Production Prerequisites: ICFM 101, ICFM 102, ICFM 203, ICFM 301 Advanced practice in film pre-production and production process.	4 (0-8-4)
ICFM 304	Sound in Film Technical and artistic principles of feature sound in film: the physics of sound; microphone selection(s) and techniques; post-production equipment and process; film sound mixing formats.	4 (0-8-4)
ICFM 305	Film Post-Production II Prerequisites: ICFM 204, ICFM 303 Advanced practice in film post-production using advanced non-linear video and audio editing stations.	4 (0-8-4)
ICFM 306	Film Laboratory Procedures Prerequisites: ICFM 201, ICFM 204 Film laboratory procedures: film processing, color grading, negative cutting, creating optical effects, film printing; and quality control in film laboratory.	4 (0-8-4)
ICFM 351	Film Criticism Introduction to the role and function of the film critic; core principles of film criticism including film theories and approaches; social and political implications of film.	4 (2-4-6)
ICFM 370	Seminar in Film Production Prerequisite: Third year or higher The course examines and finds solutions to chosen current issues or case studies in Film Production. Students are required to participate in supervised discussions supported by experienced lecturers.	2 (2-0-4)

ICFM 380	<p>Selected Topics in Film Production</p> <p>Prerequisite: Third year or higher</p> <p>Selected topics including specific film schools, directors, genres, technological developments, advanced scriptwriting for film, detailed investigation of new or emerging trends in film, etc.; special subjects determined by student interest and available instructor or visiting faculty.</p>	4 (0-8-4)
ICFM 381	<p>Independent Study in Film Production</p> <p>A directed independent study tailored to fit individual interests in a specific area of film production.</p>	4 (0-8-4)
ICFM 399	<p>International Field Study in Film Production</p> <p>Prerequisite: ICFM 303</p> <p>Introduction to the management styles of international media corporations; international artistic and business trends, and international media markets; foreign film regulations and legal considerations; innovations and technology.</p>	4 (0-12-4)
ICFM 401	<p>Film Editing</p> <p>Prerequisite: ICFM 305</p> <p>Principles and art of editing; methods and techniques in film editing: manual procedures of negative cutting.</p>	4 (0-8-4)
ICFM 402	<p>Film Producing</p> <p>Prerequisite: ICFM 101</p> <p>Role and responsibilities of the film producer: script selection, director and crew recruitment, actor negotiations, pitching investors, director-producer collaboration, publicity, and distribution.</p>	4 (0-8-4)
ICFM 455	<p>Professional Internship in Film Production</p> <p>Supervised internship in the field through placement in local film companies.</p>	4 (0-12-4)
ICFM 498	<p>Film Production Final Project I</p> <p>Pre-production and production of a 10-minute 35mm or HD format final film project. A faculty member will supervise the progression of the project over the course of the trimester.</p>	4 (0-12-4)
ICFM 499	<p>Film Production Final Project II</p> <p>Prerequisite: ICFM 498</p> <p>Post-production of the 10-minute 35mm or HD format final film project. A faculty member will supervise the progression of the project over the course of the trimester.</p>	8 (0-24-8)

| FINANCE |

ICMF 311	Intermediate Accounting I Prerequisite: ICMB 212 The framework of accounting from both a conceptual and application perspective, decision-making skills in articulating accounting policies in business organizations, researching accounting questions, problems, and cases using the Financial Accounting Standard Board (FASB) conceptual framework.	4 (4-0-8)
ICMF 312	Intermediate Accounting II Prerequisite: ICMF 311 Decision making in single and multi-period environments where there are uncertainties and complex combinations of costs, financial institutions, and current practices in performance management and evaluation.	4 (4-0-8)
ICMF 374	Money, Banking and Financial Markets Prerequisites: ICNS 104, ICMB 201, ICMB 202, ICMB 371 Operation of commercial banks and non-banking financial institutions, theory of interest rate structure and the role of the central bank, impact of monetary and other governmental policies on interest rates, flows of funds in financial markets, and aggregate spending and economic activity.	4 (4-0-8)
ICMF 375	Multinational Corporate Finance Prerequisite: ICMB 372 Characteristics and roles of international financial markets, foreign exchange markets, financial cross border trade, currency risk and portfolio diversification, introduction to derivative markets and international monetary systems affecting the management of multinational business corporations.	4 (4-0-8)
ICMF 376	Financial Modeling Prerequisites: ICBE 341, ICMB 281, ICMB 372 Employing of Microsoft Excel, Visual Basic and other software packages in application of several topics of financial management, the modeling of asset valuation, capital budgeting, cash management, cash flow analysis, and application of the Monte Carlo simulation.	4 (4-0-8)
ICMF 471	Financial Investment Prerequisite: ICMF 376 Investment principles and practices, investment policies, security analysis, mechanism and mathematics of security purchases, long-and short-term fluctuations of security prices, functions of securities markets and regulatory bodies, individual investment needs; quantitative and qualitative aspects of risk and return associated with investment decisions, and fundamental, technical, and random-walk approaches to valuation.	4 (4-0-8)

ICMF 473	Financial Theory Prerequisite: ICMF 471 Classical ideas in finance, expected utility, risk aversion, mean-variance portfolio analysis, separation theorem, time state preference and risk neutral valuation, efficient market, and core theories of capital markets and corporate finance.	4 (4-0-8)
ICMF 475	Case Studies in Finance Prerequisite: ICMF 372 Discussion of the concepts and methodologies used to explore current issues and case studies in finance.	4 (4-0-8)
ICMF 478	Risk Management Prerequisite: ICMF 375 Introduction to the management of financial risks, market risk, credit risk, operational risk, implementation of risk management techniques, the value at risk, the reduced-form approach, and the structural approach used by corporate and financial institutions in the identification, assessment, and monitoring of risk.	4 (4-0-8)
ICMF 479	Seminar in Finance Prerequisites: ICMF 473, ICMF 478 Integration of the key concepts of finance taught in previous courses including asset valuation, risk management, corporate policies, preparing a complete financial analysis, computing a firm's cost of capital using publicly available data, valuing a firm using the free cash flow method, and assessing the firm's risk using various risk models.	4 (4-0-8)

| FOOD SCIENCE AND TECHNOLOGY |

ICFS 312	Food Chemistry I Prerequisite: ICCH 211 Chemistry and biochemistry of foods; changes that occur during processing and utilization of water, carbohydrates, colloids, lipids; practical exercises included.	4 (3-2-7)
ICFS 313	Food Chemistry II Prerequisite: ICFS 312 Chemistry and biochemistry of foods: proteins, enzymes; changes that occur during processing and utilization; proteins, enzymes, basic concepts of biotechnology and genetic modification of organisms; colors and pigments; food toxicology; changes in nutrition of vitamins and minerals during processing. Practical exercises included.	4 (3-2-7)
ICFS 314	Food Analysis Prerequisite: ICCH 311 Principles of chemical and instrumental methods for the qualitative and quantitative analysis of moisture, protein, carbohydrate, lipids, dietary fiber, minerals and vitamins. Practical exercises are determination of major food components using chemical and instrumental methods.	4 (3-2-7)
ICFS 315	Food Processing I Prerequisites: ICCH 111, ICCH 211, ICCH 220, ICBI 211, ICBI 212 Introduction to the food processing industry. General characteristics of raw food materials; processing, and preservation of food materials by heating, dehydration, concentration, irradiation, ohmic heating and microwaves; processing factors that influence quality. Field trips to processing facilities are included.	4 (3-2-7)
ICFS 316	Food Processing II Prerequisite: ICFS 315 Continuation of food processing sequence; food processing techniques including preservation by chilling, freezing, membrane technology, fractionation, fermentation, high pressure processing and other emerging technologies; processing factors that influence quality; practical exercises included.	4 (3-2-7)
ICFS 321	Principles of Quality Assurance in Food Processing Prerequisites: ICFS 316, ICSC 303 Methods of quality control and management in food processing; Total Quality Management, HACCP, ISO 9000 and 14,000 series; control of raw materials, process, and finished products; sampling, evaluation of sensory properties, and other factors.	4 (4-0-8)

ICFS 322	Fruits and Vegetables Technology Prerequisites: ICFS 313, ICFS 316 Raw material handling, storage and preparation; processing and preservation of fruits and vegetables; production of fermented food products from vegetables; application of HACCP to fruit and vegetable processing; post-harvest changes in fruits and vegetables.	4 (4-0-8)
ICFS 323	Marine and Freshwater Products Technology Prerequisites: ICFS 313, ICFS 316 Raw material sources, raw material handling, storage and preparation; processing and preservation of products from both freshwater and marine sources; physical, microbiological, and chemical properties of aquatic products; HACCP and GMPs applicable to storage and processing aquatic products and basic concepts of quality assurance and quality control.	4 (4-0-8)
ICFS 324	Meat and Poultry Products Technology Prerequisites: ICFS 313, ICFS 316 Raw material sources, raw material handling, storage and preparation; processing and preservation of products from various animal sources; physical, microbiological, and chemical properties of muscle foods; ISO 9002, HACCP, and GMPs applicable to storage and processing of muscle food products and basic concepts of quality assurance and quality control.	4 (4-0-8)
ICFS 325	Dairy Products Technology Prerequisites: ICFS 313, ICFS 316 Processing and technologies of fluid milk plant operation from milk receiving to various finished products. Fluid milk, yogurt, cheese, and frozen dairy desserts; physical, microbiological, and chemical properties of fluid milk and milk components; milk quality supply; GMPs, HACCP, and basic concepts of quality assurance and quality control.	4 (4-0-8)
ICFS 331	Food Hygiene and Sanitation Prerequisites: ICCH 111, ICCH 211, ICCH 220, ICBI 211, ICBI 212 Biological and chemical hazards in food that result from improper processing, packaging, handling and storage; cleaning of food plant equipment and facilities including characteristics of soil on equipment surfaces, cleaning compounds, clean-in-place, clean-out-of-place, sanitizers and their characteristics, and GMPs.	4 (4-0-8)
ICFS 332	Food Law and Standard of Commercial Food Products Thai and international food regulations and standards applicable to the food industry.	4 (4-0-8)

ICFS 371	Food Product Development Prerequisites: ICFS 313, ICFS 316 Principles and steps used in a new product-developing process: formulation, lab-scale production, quality control, and commercial feasibility study.	4 (4-0-8)
ICFS 372	Utilization of Water and Wastewater Treatment Prerequisites: ICBI 211, ICCH 111 Sources and uses of water, municipal and agricultural water uses; ecological and biological characteristics of water; chemical characteristics of water; biological indicators of rivers and streams; water quality in streams, rivers and estuaries; water quality in lakes and reservoirs; water and wastewater treatment; biological treatment methods.	2 (2-0-4)
ICFS 381	Production Management and Marketing of Food Products Factors affecting food plant organization, production, procurement, distributing, and also the interactions required to develop food plant operation; principles of marketing, marketing systems and management with emphasis on food products; market research and analysis, consumer behavior and marketing strategies.	4 (4-0-8)
ICFS 421	Food and Nutrition Prerequisite: ICBI 212 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.	4 (4-0-8)
ICFS 423	Beverage Technology Prerequisites: ICFS 313, ICFS 316 Processing and technologies of alcoholic and non-alcoholic beverages; physical, microbiological, and chemical properties of both raw materials and finished products; GMPs, ISO 9002, HACCP, basic concepts of quality assurance and quality control applicable to the beverage industry.	4 (4-0-8)
ICFS 424	Fat and Oil Technology Prerequisites: ICFS 313, ICFS 316 Processing and technologies of edible fats and oils; physical and chemical properties of both raw materials and finished products; GMPs, ISO 9002, HACCP, basic concepts of quality assurance and quality control applicable to fat and oil technology.	4 (4-0-8)

ICFS 425	Cereal Science and Technology Prerequisites: ICFS 313, ICFS 316 The structure, composition and utilization of rice, wheat and other cereal grains for the production of starches, flours, milling by-products, and cereal-based human food products; cereal processing technologies such as dry and wet milling, baking, extrusion cooking, breakfast cereals and noodle and pasta manufacturing; the Quality/Sanitary Control and Quality Assurance aspects of production; practical exercises.	4 (3-2-7)
ICFS 431	Food Microbiology Prerequisite: ICBI 211 Microbial ecology related to food; the effect of environment on food spoilage and food manufacture; physical, chemical, and biological destruction of microorganisms in foods; microbiological examination of foods; public health and sanitation microbiology; practical exercises.	4 (3-2-7)
ICFS 432	Sensory Evaluation of Food Products Prerequisites: ICFS 313, ICFS 316 Basic discrimination/difference tests, data analysis and interpretation of results; basic scaling procedures such as ranking, interval scaling and magnitude estimation; 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.	4 (4-0-8)
ICFS 441	Food Engineering I Prerequisites: ICPY 210, ICMA 215 Introduction to engineering operations in food processing, process control, and instrumentation. Engineering principles including material and energy balances, thermodynamics, fluid flow, heat transfer, refrigeration, and psychometrics as applied to foods; practical exercises included.	4 (3-2-7)
ICFS 442	Food Engineering II Prerequisite: ICFS 441 Continuation of Food Engineering I; the principles and measurement of various physical properties of foods that measure the overall quality of fresh and prepared foods. These are properties that are important in handling, preparing, processing, preserving, packaging, storing, and distribution of foods, also the principles and limitations of instrumental methods that are currently used to determine physical properties of foods; practical exercises included.	4 (3-2-7)

ICFS 452	Food Packaging Prerequisites: ICFS 313, ICFS 316 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.	4 (4-0-8)
ICFS 463	Field Trip Visits and industrial plant studies of food manufacturing industry or related organizations	2 (0-6-2)
ICFS 491	Seminar in Food Science and Technology Prerequisite: Seniors Senior student presentations, discussion of research, and review of topics of current interest. Staff and invited speakers from Mahidol University and from other universities or the food processing industry.	2 (2-0-4)
ICFS 492	Senior Project in Food Science and Technology Prerequisite: Seniors Small research projects in Food Science and Technology or related fields under the supervision of a research advisor.	6 (0-12-6)
ICFS 493	Internship Industrial work-internship program in the food manufacturing industry, the industrial internship program will focus on actual work and on-the-job training at production line, process control, quality control of process and product, laboratory work; chemical, physical, microbiological analysis.	4 (0-12-4)

| FRENCH |

ICLF 211	Pre-intermediate French I Prerequisites: ICML 123, refresher course or placement test. Elements of complex grammar and vocabulary related to a variety of everyday contexts allowing the students to discuss familiar topics, express opinions in a more elaborate way, ask for clarification, read a wider variety of texts, and write simple letters or narratives.	4 (4-0-8)
ICLF 212	Pre-intermediate French II Prerequisite: ICLF 211 More complex grammar and vocabulary allowing the students to hold a short conversation, ask for, understand and offer information in a broader variety of familiar topics, read more elaborate texts, and write longer letters or narratives.	4 (4-0-8)
ICLF 213	Pre-intermediate French III Prerequisite: ICLF 212 Consolidation of the acquisitions of ICLF 211 and 212 and further mastering of complex grammar and vocabulary in order to allow the students to fully reach a standard pre-intermediate level of proficiency.	4 (4-0-8)
ICLF 311	Intermediate French I Prerequisite: ICLF 213 Elements of advanced 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.	4 (4-0-8)
ICLF 312	Intermediate French II Prerequisite: 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 situations, and read and write simple argumentative texts related to such contexts.	4 (4-0-8)
ICLF 313	Intermediate French III Prerequisite: 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.	4 (4-0-8)

- ICLF 320** **Intermediate French: Written Skills A** **4 (4-0-8)**
Prerequisite: ICLF 313
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.
- ICLF 330** **Intermediate French: Oral Skills A** **4 (4-0-8)**
Prerequisite: ICLF 320
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.

| GERMAN |

ICLG 211	Pre-intermediate German I Prerequisite: ICML 103, refresher course or placement test. Elements of complex grammar and vocabulary related to a variety of everyday contexts allowing the students to discuss familiar topics, express opinions in a more elaborate way, ask for clarification, read a wider variety of texts, and write simple letters or narratives.	4 (4-0-8)
ICLG 212	Pre-intermediate German II Prerequisite: ICLG 211 More complex grammar and vocabulary allowing the students to hold a short conversation, ask for, understand and offer information in a broader variety of familiar topics, read more elaborate texts, and write longer letters or narratives.	4 (4-0-8)
ICLG 213	Pre-intermediate German III Prerequisite: ICLG 212 Consolidation of the acquisitions of ICLG 211 and 212 and further mastering of complex grammar and vocabulary in order to allow the students to fully reach a standard pre-intermediate level of proficiency.	4 (4-0-8)
ICLG 311	Intermediate German I Prerequisite: ICLG 213 Elements of advanced 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.	4 (4-0-8)
ICLG 312	Intermediate German II Prerequisite: ICLG 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 situations, and read and write simple argumentative texts related to such contexts.	4 (4-0-8)
ICLG 313	Intermediate German III Prerequisite: ICLG 312 Consolidation of the acquisitions of ICLG 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.	4 (4-0-8)

- ICLG 320 Intermediate German: Written Skills A 4 (4-0-8)**
Prerequisite: ICLG 313
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.
- ICLG 330 Intermediate German: Oral Skills A 4 (4-0-8)**
Prerequisite: ICLG 320
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.

| HEALTH EDUCATION |

ICHE 101	Health Education	2 (2-0-4)
	Understanding of and attitude toward personal, family and community health needs; epidemiology of diseases; nutritional behavior; communicable diseases; sexual behavior; sexually transmitted diseases; mental health; drug usage.	

| HUMANITIES |

ICHM 101	Introduction to Philosophy Recommended: ICCM 105 Introduction to 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.	4 (4-0-8)
ICHM 103	Introduction to Logic Recommended: ICCM 105 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; in-depth study of Truth-Functional Logic (also coined Propositional or Sentential Logic) plus fundamentals of traditional Syllogistics and basic Predicate Logic (Quantification Theory).	4 (4-0-8)
ICHM 105	Music Appreciation Recommended: ICCM 105 Introduction to distinctive features of Western classical music with paradigmatic examples for 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.	4 (4-0-8)
ICHM 106	Moral and Ethical Studies Recommended: ICCM 105 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] as well as paradigmatic ethical dilemmas.	4 (4-0-8)
ICHM 107	Introduction to Asian Philosophy Recommended for Culture Track students: ICHM 101 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.	4 (4-0-8)

ICHM 140	Elementary Art Theory Recommended: ICCM 105 Introduction to 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.	4 (4-0-8)
ICHM 141	Art Appreciation I Recommended for Culture Track students: ICHM 140 Visual and historic elements of art; study of the most important works of art from the classical periods in art history, from ancient Greece and Rome through the 16th century Renaissance and early Baroque periods.	4 (4-0-8)
ICHM 142	Art Appreciation II Prerequisite: ICHM 141 Art from the 18th century through to the 20th century; reading from selected texts to understand the overall cultural and intellectual context for the modern and post-modern periods in art and architecture.	4 (4-0-8)
ICHM 143	Introduction to Photography Recommended for Culture Track students: ICHM 140 An introduction to the 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, and the aesthetics of picture taking.	4 (3-2-7)
ICHM 144	Intermediate Photography Recommended for Culture Track students: ICHM 140 An introduction to the technical aspects of digital photography and digital darkroom technique; an advanced study of communicative uses of the aesthetic tools of photography; exposure to a variety of photographic artists with an emphasis on contemporary art; different approaches to the artistic process.	4 (4-0-8)
ICHM 203	Intermediate Logic Prerequisite: ICHM 103 In-depth study of 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.	4 (4-0-8)
ICHM 206	Ethics and Technology Recommended for Culture Track students: ICHM 106 Traditional and non-traditional ethical theories and their application to issues in modern technology topics.	4 (4-0-8)

ICHM 212	Enlightenment in European Literature Introduction to the crucial 18th century formative period in Europe (and beyond) through literary texts. Exploration of diverse topics such as 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. 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.	4 (4-0-8)
ICHM 213	Elements of Knowledge Representation Introduction to 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.	4 (4-0-8)
ICHM 206	Ethics and Technology Traditional and non-traditional ethical theories and their application to issues in modern technology topics.	4 (4-0-8)
ICHM 218	Film Studies Recommended for Culture Track students: ICHM 140 Presentation of the picture 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 will be chosen from films made in the United States, Europe and Asia.	4 (4-0-8)
ICHM 223	Thai Arts Recommended for Culture Track students: ICHM 140 Exploration of Thai art forms including painting, sculpture, and architecture found in Thailand from pre-historic to modern periods; influence of other cultures on Thai arts.	4 (4-0-8)
ICHM 225	The Western Classical Ideal An interdisciplinary study of 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; the myths of ancient Greece and new sciences and philosophies that came to characterize what is known as "the Age of the Greek Enlightenment".	4 (4-0-8)

- ICHM 241** **Introduction to Drawing** **2 (1-2-3)**
- Recommended for Culture Track students:** ICHM 140
- 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.
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- ICHM 242** **Intermediate Drawing** **2 (1-2-3)**
- Prerequisite:** ICHM 241
- Application and practice 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.

| INFORMATION SYSTEMS |

ICIS 210	Introduction to Programming Introduction to a computer programming language such as C or C++, elementary concepts covering problem solving and algorithm development, programming standards, variable types, control structures and loops and arrays.	4 (3-2-7)
ICIS 381	Fundamental of Computer Systems Introduction to the major features of computer systems, the architecture of the CPU, secondary storage, I/O devices, databases, networking, electronic commerce, the programming process and systems analysis.	4 (4-0-8)
ICIS 382	Object-Oriented Programming Prerequisites: ICIS 210, ICIS 381 The use of object-oriented programming languages in the development of modern, business applications. Object-oriented design, encapsulation, object interfaces, inheritance, aggregation, abstract classes, polymorphism, data structures and exception handling.	4 (3-2-7)
ICIS 383	Database Management Systems Prerequisites: ICMB 211, ICIS 210, ICIS 381 Logical organization of databases: the entity-relationship model. Relational database concepts, data design, modeling and normalization; the use of Structured Query Language to define, manipulate and test the database.	4 (3-2-7)
ICIS 384	Introduction to Computer Networks Prerequisites: ICIS 381 Architecture and components of computer communications networks; protocol concepts and standards; OSI Reference Model; network/protocol architecture examples: Internet, Intranets, Extranets, and local area networks.	4 (4-0-8)
ICIS 385	Information Technology Economics Economics of information systems and information technology, estimating, budgeting, budget management, cost accounting, value assessment, and accountability of information systems and information technology.	4 (4-0-8)
ICIS 386	Electronic Commerce Prerequisite: ICMB 221 Electronic commerce (EC) and electronic business (EB) implementation. E-business topics and concepts including EC business models, electronic payment systems, EC infrastructure, implementation concerns, design criteria, solution of business problems through case studies and other Web aspects.	4 (4-0-8)

ICIS 387	Information Systems Security Examines potential security risks in today intensive information organizations. Topics that would be covered include viruses, security reviews, encryption, authentication, firewalls, and disaster recovery plans.	4 (4-0-8)
ICIS 388	Network Programming Prerequisite: ICIS 210 An introduction to the most commonly used script and programming languages used to develop distributed system applications, writing multi-thread processes, connecting and communicating through sockets, and designing server-side and client side software, as well as CGI programming.	4 (3-2-7)
ICIS 389	Information Systems in Management Prerequisite: ICMB 281 Relationship between information systems and organizations and demonstration of how computers and information systems are integral to modern organizations such as Enterprise Resource Planning, Supply Chain Management and Customer Relationship Management.	4 (4-0-8)
ICIS 481	Internet Design and Development Prerequisite: ICMB 281 Internetworking applications and development on the Internet, electronic data interchange, electronic commerce, information access, and application development technologies and techniques; planning, implementation, security, privacy, ethics, and management as they relate to developing a web site in a business.	4 (4-0-8)
ICIS 482	Systems Analysis and Design Prerequisites: ICIS 383, ICIS 384, ICIS 389 Introduction to information systems development. Systems analyst, the systems development life cycle, methodologies, development technology, systems planning, project management, systems analysis, systems design, systems implementation and systems support.	4 (4-0-8)
ICIS 483	Software Engineering Prerequisites: ICIS 210, ICIS 382, ICIS 388, ICIS 482 Software engineering methodologies and technologies useful for developing quality and cost-effective software. Engineering of programming systems products, current problems in software development, time management, cost estimation models, growth dynamics, software reliability models and models of program testing.	4 (4-0-8)

ICIS 488 **IT Based Knowledge Management** **4 (4-0-8)**

Issues in learning organization and IT support; ineffective unlearning or obsolete technologies; knowledge management, a knowledge organization, and knowledge workers; creating knowledge from data, the role of technology, and the application of knowledge management to benefit the organization.

| INTERNATIONAL BUSINESS |

ICMI 352	<p>Legal Issues in International Business</p> <p>Prerequisites: ICMB 341, ICMB 351</p> <p>An examination of regulations and legal aspects of international business, written contracts, cultural attitudes and incentives, documents of foreign investment, anti-trust law, foreign layoffs, disclosure requirements, and protection of copyrights, patents and trademarks.</p>	4 (4-0-8)
ICMI 354	<p>Cross-cultural Management</p> <p>Prerequisite: ICMB 232</p> <p>Cross cultural management issues, problems of communicating across cultures, managing cultural diversity, the development of multi-cultural teams, leadership, motivations, decision making, conduction international business negotiation, international business ethics, and the development of careers.</p>	4 (4-0-8)
ICMI 355	<p>Business Alliance</p> <p>Prerequisite: ICMB 351</p> <p>Potential advantages created by developing alliances within and between industries, strategic potential, the method of developing and managing such relationships.</p>	4 (4-0-8)
ICMI 357	<p>Business Communication</p> <p>Prerequisites: ICCM103, ICMB 232</p> <p>Communication skills and format used in business and administrative messages; both oral and written forms, organizational communication, international correspondence, and how to conduct an effective meeting.</p>	4 (4-0-8)
ICMI 358	<p>People and Organization in International Business</p> <p>Prerequisites: ICMB 233, ICMB 351</p> <p>Exploring the nature and the development process of international business: formal organization structures and processes control systems, organizational culture and the people, organizational development and changes, understanding and effectively managing human resource, differences in labor markets, culture, legal systems, economic systems and many other business environmental factors.</p>	4 (4-0-8)
ICMI 360	<p>Leadership Development</p> <p>Prerequisite: ICMB 232</p> <p>The current models and approaches for effective managerial behavior, developing managerial and leadership skills, and strategic planning and policy development.</p>	4 (4-0-8)

ICMI 454	International Logistic Management Prerequisite: ICMB 351 The nature of international problems associated with the supply, distribution, and sourcing of products, the operational support of market development in foreign countries, international sourcing and the management of supply and distribution activities.	4 (4-0-8)
ICMI 456	Export-Import Management Prerequisite: ICMB 351 The basics of exporting and importing management, an introduction to the intricacies of how export and import deals function, procedures and documentation, identifying an international trade opportunity and bringing the opportunity to fruition.	4 (4-0-8)

ICSO 201	Human Geography An introduction to human life in relationship to geographical space; topics may include population growth and distribution, patterns of livelihood, agricultural and industrial location, global disparities between rich and poor, the concept of 'development', human settlements, transportation, regional cultural patterns, states, ethnicities, and global order.	4 (4-0-8)
ICSO 202	Major Social Institutions Basic social institutions in comparative global perspective, marriage and the family, economy and work, politics and government, religion, education, sports and leisure, science, health and medicine, the mass media.	4 (4-0-8)
ICSO 203	Global Change in the Late Twentieth Century A study of 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.	4 (4-0-8)
ICSO 205	Paradigms in the Social Sciences I An historical survey of the major paradigms in the Social Sciences (History, Political Science, Economics, Sociology, Anthropology, Geography, Psychology) up to the end of the nineteenth century.	4 (4-0-8)
ICSO 206	Paradigms in the Social Sciences II An historical survey of the major paradigms in the Social Sciences (History, Political Science, Economics, Sociology, Anthropology, Geography, Psychology) during the twentieth century.	4 (4-0-8)
ICSO 207	The History of the World Economy International trade up to c.1450; the creation of a world economy in the 16th C.; 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; multinationals; globalization.	4 (4-0-8)

ICSO 201	Human Geography An introduction to human life in relationship to geographical space; topics may include population growth and distribution, patterns of livelihood, agricultural and industrial location, global disparities between rich and poor, the concept of 'development', human settlements, transportation, regional cultural patterns, states, ethnicities, and global order.	4 (4-0-8)
ICSO 202	Major Social Institutions Basic social institutions in comparative global perspective, marriage and the family, economy and work, politics and government, religion, education, sports and leisure, science, health and medicine, the mass media.	4 (4-0-8)
ICSO 203	Global Change in the Late Twentieth Century A study of 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.	4 (4-0-8)
ICSO 205	Paradigms in the Social Sciences I An historical survey of the major paradigms in the Social Sciences (History, Political Science, Economics, Sociology, Anthropology, Geography, Psychology) up to the end of the nineteenth century.	4 (4-0-8)
ICSO 206	Paradigms in the Social Sciences II An historical survey of the major paradigms in the Social Sciences (History, Political Science, Economics, Sociology, Anthropology, Geography, Psychology) during the twentieth century.	4 (4-0-8)
ICSO 207	The History of the World Economy International trade up to c.1450; the creation of a world economy in the 16th C.; 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; multinationals; globalization.	4 (4-0-8)

ICSO 210	World History A (c.1400 — 1763) 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.	4 (4-0-8)
ICSO 211	World History B (c.1763 — 1914) 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.	4 (4-0-8)
ICSO 212	World History C (c.1914 — 1945) 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.	4 (4-0-8)
ICSO 213	World History D (c.1945 — 2000) A short introduction to selected aspects of world history since World War II; the USA and 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.	4 (4-0-8)
ICSO 231	Modern History of East Asia The 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 world role of East Asia.	4 (4-0-8)

ICSO 232	Civilizations of East Asia	4 (4-0-8)
	Cultural patterns and developments in China, Japan, and Korea; the nature of tradition, East Asian world views, Confucianism, Buddhism, Daoism, Shintoism; population movements; craftsmanship and economic and scientific development; the high arts.	
ICSO 233	Civilizations of East Asia II	4 (4-0-8)
	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 Ch=ing (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 influence.	
ICSO 234	The Indian Sub-Continent up to c.1500	4 (4-0-8)
	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.	
ICSO 235	The Indian Sub-Continent since c.1500	4 (4-0-8)
	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.	
ICSO 237	Australasia Since 1770	4 (4-0-8)
	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 the war in Indochina, international relations both within and beyond the region.	
ICSO 238	Africa Since 1800	4 (4-0-8)
	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.	

ICSO 239	The Middle East Since 1800	4 (4-0-8)
	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.	
ICSO 241	Latin America Since 1800	4 (4-0-8)
	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.	
ICSO 243	North America c. 1763-1900	4 (4-0-8)
	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.	
ICSO 244	The United States and Canada since 1900	4 (4-0-8)
	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 Viet Nam War; American society and politics since 1945; race relations; the Quebec independence movement and the future of Canada; the contemporary scene.	
ICSO 245	European Society and Culture up to 1945	4 (4-0-8)
	An outline of the political and cultural development of Europe up to 1945; the geography of the European continent; the legacy of Greece and Rome; the medieval heritage; the Renaissance and Reformation; overseas exploration and colonialism since the 15th century; nation and empire building; the Enlightenment; the impact of the French revolution; Romanticism; science, technology and industrialism; 19th century nationalism and the European wars of the 20th century; cultural developments in the early 20th century.	

ICSO 246	Europe Since 1945	4 (4-0-8)
	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 legacies; the European Union; the contemporary situation and future prospects.	
ICSO 247	The European Union: Development, Institutions, and Politics	4 (4-0-8)
	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.	
ICSO 248	Russia and the Soviet Union since 1800	4 (4-0-8)
	The geography of Russia; society, political institutions and economic developments under the tsars; the rise of revolutionary movements: Socialists, Communists and Anarchists; autocracy and liberalism; 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; contemporary Russia.	
ICSO 250	European Classical Heritage	4 (4-0-8)
	A survey of the political, religious-mythological, political-legal and legacies of Greece and Rome from c. 600 BCE-1450 CE., Topics covered shall include the rise of democracy in Athens, Republican Rome and its transition to Empire, the legacy of Roman law, the ancient Greek myths and early Christianity in Rome, the literature of the Greeks and Romans and the important elements of sculpture, painting and architecture that made decisive contributions to later European culture.	
ICSO 251	Medieval and Renaissance Europe	4 (4-0-8)
	An outline of the political, economic and cultural development of Europe up to c.1450., the geography of the European continent, the legacy of Greece and Rome, the medieval heritage, the Renaissance.	
ICSO 252	Early Modern Europe, c.1450-c.1700	4 (4-0-8)
	An outline of the political, economic and cultural development of Europe, c.1450-c.1700., the Reformation, other religious developments, political systems and theories, warfare, early overseas exploration and colonialism, the Scientific Revolution, developments in art, music and literature.	

ICSO 253	The European Ancient Regime and Revolution, c.1700-c.1830 An outline of the political, economic and cultural development of Europe, c.1700-c.1830., absolutism and constitutionalism, the Enlightenment, science, technology and industrialism, the French revolution and its impact, Napoleon, early 19th century political movements, warfare, overseas exploration and colonialism, religious developments, developments in art, music and literature.	4 (4-0-8)
ICSO 254	European Society and Culture, c.1830-1945 An outline of the political, economic and cultural development of Europe, c.1830-1945, nineteenth century nationalism and political movements, industrialization and the economy, warfare, overseas exploration and colonialism, religious developments, developments in science, technology, art, music and literature.	4 (4-0-8)
ICSO 261	Economic Geography 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 activity; core and periphery; historical changes in the world economy; economic globalization in geographical perspective.	4 (4-0-8)
ICSO 262	Global Resources 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.	4 (4-0-8)
ICSO 263	Population and Migration in the Modern World 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.	4 (4-0-8)
ICSO 264	The World Economy Since 1945 The world economy in 1945; economic growth in North America, Western Europe and Japan; the impact of technology; the Bretton Woods system; changes in international trade and finance; multinationals; the situation in the Soviet Union and its successor states; the questions of development and dependence in the 'Third World'; international competitiveness; protectionism and free trade; OPEC and other producer organizations; regional trade organizations.	4 (4-0-8)

ICSO 271	International Relations	4 (4-0-8)
	The principles and practice of international relations, with particular reference to the modern world; the bases of international power and interstate competition; inequalities between states, including domination and colonialism; war and conflict resolution between 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.	
ICSO 272	Comparative Political Systems	4 (4-0-8)
	A study of the 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.	
ICSO 273	World Politics and World Order	4 (4-0-8)
	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; the contemporary situation.	
ICSO 274	International Organizations	4 (4-0-8)
	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.	
ICSO 275	Democracy as a Political System	4 (4-0-8)
	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.	
ICSO 276	History of War	4 (4-0-8)
	The history of warfare since antiquity, but with particular reference to the modern period; the development of armed forces; 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 the military-industrial complex; types of warfare in the contemporary world.	

ICSO 280	Gender Issues in the Modern World	4 (4-0-8)
	Traditional roles of men and women in various world societies; sociological and psychological theories relating to gender roles; historical development of feminist thought and women's movements; contemporary women's issues worldwide; contemporary men's issues worldwide.	
ICSO 281	The Social Impact of Science and Technology on Societies	4 (4-0-8)
	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.	
ICSO 282	Global Media and Social Change	4 (4-0-8)
	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.	
ICSO 283	International Cultural Studies	4 (4-0-8)
	Culture in the modern world; Semiotics; how culture is defined and created; modernity, post-modernity, and technoculture; dominant and minority cultural forms; gender, sexuality and ethnicity; globalism and post-colonialism; the culture of everyday life.	
ICSO 284	History of Disease and Medicine	4 (4-0-8)
	Historical changes in the incidence and types of disease, the development of medicine.	
ICSO 285	Drugs and Society	2 (2-0-4)
	The social environment and correlates of drug addiction; the drug industry and crime; international repercussions; governmental and medical policies towards drug use and their effectiveness.	
ICSO 301	Research Methods in the Social Sciences	4 (4-0-8)
	An introduction to the scientific method and its use in social science research; examination of research methods, data collection, survey techniques, and hypothesis formation and testing.	
ICSO 302	Historiography	4 (4-0-8)
	The history; a survey of approaches to the writing of history from ancient times to the present; historical methodology and analysis and related theoretical concerns; the nature and use of sources; contemporary issues and debates in historiography.	

ICSO 303	Modern Social Theory An introduction to the major contemporary theoretical approaches in the Social Sciences, particularly in Sociology, Anthropology and Cultural Studies; key concepts, issues and debates; different views of the social world; practical implications and applications in social research methodology.	4 (4-0-8)
ICSO 309	Political Movements Political movements and the ideas that inspired them, paradigm shifts in political systems, the 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.	4 (4-0-8)
ICSO 332	Human Rights 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.	4 (4-0-8)
ICSO 341	Society, Politics and Economics in Contemporary East Asia Prerequisite: ICSO 231 An overview of the contemporary East Asian scene; the Japanese economic crisis and its political fallout; the rapid rise of China and the struggle with Taiwan; North and South Korea; the Asian economic crisis; political uncertainties in Southeast Asia; the human rights situation; religious movements; separatism; the Tibet question.	4 (4-0-8)
ICSO 342	Society, Politics and Economics in Contemporary South Asia Prerequisite: ICSO 235 An overview of the contemporary scene in South Asia; military government in Pakistan; Indian democracy; political Hinduism; ethnic struggle in Sri Lanka; Islamic fundamentalism in Pakistan and Bangladesh; the Indian technological revolution; human rights questions.	4 (4-0-8)
ICSO 343	Society, Politics and Economics in Contemporary Australasia Prerequisite: ICSO 237 The contemporary Australasian region; the rise in status of the Pacific Rim; nationalism and republicanism; ethnic relations; economic and social developments in Australia, New Zealand, New Guinea and the Pacific island nations.	4 (4-0-8)

- ICSO 344 Society, Politics and Economics in Contemporary Africa 4 (4-0-8)**
Prerequisite: ICSO 237
 The contemporary situation in Africa; successful and unsuccessful states; economic development and stagnation; poverty, hunger and AIDS; corruption and leadership problems; ethnic relations; civil and international wars; post-apartheid South Africa; intra-African relations.
- ICSO 345 Society, Politics and Economics in Contemporary Middle East 4 (4-0-8)**
Prerequisite: ICSO 239
 The contemporary scene in the Middle East; the Arab-Israeli struggle, regional powers, the status of Palestine; Islamic governments in Afghanistan, Iran and Sudan; the struggle of religion and state; Westernization in Lebanon and Turkey; the question of Cyprus; future prospects.
- ICSO 346 Society, Politics and Economics in Contemporary Latin America and the Caribbean 4 (4-0-8)**
Prerequisite: ICSO 241
 The contemporary situation of Latin America and the Caribbean; the rise of democracy; the international drug trade and its social impact; economic development and its consequences for society; the persistence of poverty; popular political and religious movements; inter-American and international relations.
- ICSO 347 Society, Politics and Economics in Contemporary North America 4 (4-0-8)**
Prerequisite: ICSO 244
 A survey of contemporary Canada and the United States; economic prosperity and challenges; national political developments, social problems; North America and the world; US - Canadian relations; the formation of NAFTA; the new role of NATO, the US role as the sole remaining superpower.
- ICSO 348 Society, Politics and Economics in Contemporary Europe 4 (4-0-8)**
Prerequisite: ICSO 246
 The current situation in Europe; economic developments and prospects; 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 349 Society, Politics and Economics in Contemporary Russia and the Former Soviet Republics 4 (4-0-8)**
Prerequisite: ICSO 248
 Contemporary Russia and the former Soviet Republics; the legacy of Communism; the new openness, economic hardship and dependency on the West, patterns of economic development; the rise of organized crime; the new status of religion; Russia and the information revolution; future prospects.

ICSO 350	Contemporary China and the Chinese World Contemporary politics, economics, society and culture in the People Republic of China, Hong Kong and Taiwan; international relations in a Chinese perspective.	4 (4-0-8)
ICSO 351	Contemporary Japan and Korea Contemporary politics, economics, society and culture in Japan and the two Koreas; international relations in Japanese and Korean perspectives.	4 (4-0-8)
ICSO 360	Patterns and Consequences of Development 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.	4 (4-0-8)
ICSO 364	Slavery and Human Trafficking The history of slavery and human trafficking, their occurrence in the modern world, case studies, common themes, possible solutions.	4 (4-0-8)
ICSO 365	Genocide and Ethnic Cleansing The occurrence of genocide and ethnic cleansing in the modern world, case studies, common themes, possible solutions.	4 (4-0-8)
ICSO 366	Indigenous Cultures in the Modern World Small-scale and tribal societies in the modern world; the impact of incorporation into modern states; cultural change, resistance and survival.	4 (4-0-8)
ICSO 367	Environmental Issues in Social Context An historical review of the human impact on the environment; major contemporary environmental issues; economic development, state policies and business practices in relationship to the environment; environmentalism as a social and political movement; relations with business and government: tensions, and the possibilities of conflict and cooperation.	4 (4-0-8)
ICSO 369	NGOs and Political and Business Contexts 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 to the state and international organizations; the politics, organization and finance of NGOs; NGOs in relationship to business.	4 (4-0-8)

ICSO 370	Diplomacy and Negotiation	4 (4-0-8)
	The uses of diplomacy and negotiation in resolving political and commercial disputes; the role and status of diplomats and of negotiators; the question of political versus commercial issues; state-to-state relations, business-to-state relations, international business-state relations.	
ICSO 371	Foreign Policy of the Major Powers Since 1945	4 (4-0-8)
	The foreign policy of the United States, the Soviet Union and China since 1945; objectives and realities; relations between these powers; the foreign policy role played by the Western European powers, Japan and India.	
ICSO 374	Revolution, Terrorism and the Modern State	4 (4-0-8)
	A brief historical survey of revolution and terrorism; theories of revolution and terrorism; a critical examination of political theory regarding the rights and wrongs of revolt and terrorism; the relationship of the modern state to revolution and terrorism.	
ICSO 376	War, the Military, Society and the State	4 (4-0-8)
	Prerequisite: ICSO 276	
	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 freedoms in times and places of war; politics and war; patterns of military organization; the possible social and political role of the military.	
ICSO 377	Devolution, Privatization and the State	4 (4-0-8)
	A critical examination of the factors leading to devolution and decentralization in government; the popularity of local autonomy and regionalism in politics; the parallel trend of de-regulation and privatization in business; re-defining the role of national and central governments and their responsibilities to citizens.	
ICSO 378	International Law and the State	4 (4-0-8)
	The nature, development and current status of international law; the legal personality of states and other entities under 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.	
ICSO 381	Ethnicity, Society and the State	4 (4-0-8)
	The concept of ethnicity; ethnic labelling 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.	

ICSO 382	Religion, Society and the State Religion and society; types of religious organization and movement and their social role and impact; secularization and counter-secularization; religion, politics and the state; case studies of the contemporary role of religion in selected societies.	4 (4-0-8)
ICSO 383	International Crime and Law Enforcement The rise of international crime; smuggling; sea and air piracy; trade in human cargoes; the international drug trade; cultural property; human rights and crimes against humanity; INTERPOL and the means and problems of enforcement; extradition, immunity and asylum under International law; transnational pursuit.	4 (4-0-8)
ICSO 384	Migration, Diasporas, and Culture The cultural impact of the movement of peoples; reasons and contexts of migration historically; the preservation and transformations of traditional cultures and identities in alien lands; enclave communities and host societies; generational differences in culture amongst migrants; the image of the homeland.	4 (4-0-8)
ICSO 390	Tourism: Development and Cultural Change The role of tourism in economic development; the impact of tourism upon traditional culture and the effects of tourism upon the patterns of cultural change: destruction, preservation, and construction; the role of traditional culture in attracting tourists.	4 (4-0-8)
ICSO 400	Senior Seminar (Social Science) Seminar discussion of selected topics in the Social Sciences. Student participants will prepare and present seminar papers on substantive or methodological issues in their subject area.	4 (4-0-8)
ICSO 401	Independent Study in the Social Sciences Independent work under the supervision of an instructor. The student will be required to produce a quality paper on an approved topic or issue of interest.	4 (4-0-8)

| MARKETING |

ICMK 316	Consumer Behavior Prerequisite: ICMB 221 Introduction to theories of consumer behavioral analysis, consumer decision-making process, consumer psychological processes and their impact on marketing decision, and social and cultural dimension in the consumer purchasing process.	4 (4-0-8)
ICMK 317	Marketing Research I Prerequisite: ICNS 104, ICMB 221 Introduction to marketing research, importance and role of marketing research in business decisions, research processes, research methodology and research tools, with an emphasis on qualitative research.	4 (4-0-8)
ICMK 318	Marketing Research II Prerequisite: ICMK 317 In-depth study of marketing research with an emphasis on quantitative aspects of marketing research, development of questionnaires, sampling methods, data collection, data analysis and interpretation, and the use of research findings in marketing decisions.	4 (4-0-8)
ICMK 319	New Product Management Prerequisite: ICMK 316 Product management policy, strategies in developing and positioning products and product lines throughout the product life cycle, new product introduction, improvements, and deletion strategy.	4 (4-0-8)
ICMK 323	Integrated Marketing Communication Prerequisite: ICMB 221 An exploration of the nature and purpose of advertising and sales promotion in accordance with an integrated marketing communications perspective, shows how these activities will fit into the general process of marketing management, and specifically addresses marketing objectives and budget, target audience selection, communication objective, creative strategy, integrated communication strategy and media strategy.	4 (4-0-8)
ICMK 325	Business Marketing Prerequisite: ICMB 221 Explore the principles of business management, developing a market strategy in business marketing and business customer relationship management.	4 (4-0-8)

ICMK 328	Marketing Channel Management Prerequisite: ICMK 316 Management of the firm's distribution systems, role of channel members, the impact of marketing channel decisions on marketing strategy, channel design and management, and an overview of supply chain management.	4 (4-0-8)
ICMK 329	Advertising and Graphic Design Prerequisite: ICMB 221 Overview of advertising and graphic design, development of ideas in advertising, computer graphic design skills necessary in marketing communication, multimedia, printmaking, editorial design, photography, typography, and information graphics.	4 (4-0-8)
ICMK 330	Strategic Brand Management Prerequisite: ICMB 221 Brand management and strategy in creating, leveraging, and preserving brand equity, the use of qualitative and quantitative methods in evaluating brand equity, brand strategy at different stages of the product life cycle, development of brand positioning, managing total brand experience and brand relevancy.	4 (4-0-8)
ICMK 424	Global Marketing Strategy Prerequisite: ICMB 221, ICMB 351 Management of international marketing strategy, frameworks for developing international marketing strategy, sources of sustainable competitive advantage, international market source analysis, market entry strategy, and integration of marketing strategy with other functional strategies.	4 (4-0-8)
ICMK 425	Retail Management Prerequisite: ICMB 221 Study of retailers' marketing and operational strategies, strategy development, implementation and control issues, and the use of case studies.	4 (4-0-8)
ICMK 428	Marketing Strategy Prerequisite: ICMK 316, ICMB 371, Seniors Introduction to high-level marketing decision making using several strategic marketing planning frameworks, market analysis and market planning, competitive analysis, long-term marketing advantages, an analysis of return on marketing, profit and other financial considerations.	4 (4-0-8)

| MODERN LANGUAGES |

ICML 101	Elementary German I Prerequisite: None (placement test required for students with prior knowledge) Elements of fundamental grammar and basic vocabulary allowing the students to request, give and understand basic information, read simple short texts, and write at a simple sentence level.	4 (4-0-8)
ICML 102	Elementary German II Prerequisites: ICML 101 or placement test More fundamental grammar and basic vocabulary allowing the students to hold simple short conversations on common topics and situations, express opinions in a simple form, read short texts and write at a short paragraph level.	4 (4-0-8)
ICML 103	Elementary German III Prerequisites: ICML 102 or placement test Consolidation of the acquisitions of ICML 101 and 102 and further mastering of fundamental grammar and basic vocabulary in order to allow the students to fully achieve a standard elementary level of proficiency.	4 (4-0-8)
ICML 111	Elementary Japanese I Prerequisite: None (placement test required for students with prior knowledge) Elements of fundamental grammar and basic vocabulary allowing the students to request, give and understand basic information, read simple short texts, and write at a simple sentence level.	4 (4-0-8)
ICML 112	Elementary Japanese II Prerequisites: ICML 111, refresher course or placement test. More fundamental grammar and basic vocabulary allowing the students to hold simple short conversations on common topics and situations, express opinions in a simple form, read short texts and write at a short paragraph level.	4 (4-0-8)
ICML 113	Elementary Japanese III Prerequisites: ICML 112 or placement test Consolidation of the acquisitions of ICML 111 and 112 and further mastering of fundamental grammar and basic vocabulary in order to allow the students to fully achieve a standard elementary level of proficiency.	4 (4-0-8)
ICML 121	Elementary French I Prerequisite: None (placement test required for students with prior knowledge) Elements of fundamental grammar and basic vocabulary allowing the students to request, give and understand basic information, read simple short texts, and write at a simple sentence level.	4 (4-0-8)

ICML 122	Elementary French II Prerequisites: ICML 121 or placement test More fundamental grammar and basic vocabulary allowing the students to hold simple short conversations on common topics and situations, express opinions in a simple form, read short texts and write at a short paragraph level.	4 (4-0-8)
ICML 123	Elementary French III Prerequisites: ICML 122 or placement test Consolidation of the acquisitions of ICML 121 and 122 and further mastering of fundamental grammar and basic vocabulary in order to allow the students to fully achieve a standard elementary level of proficiency.	4 (4-0-8)
ICML 131	Elementary Chinese I Prerequisite: None (placement test required for students with prior knowledge) Elements of fundamental grammar and basic vocabulary allowing the students to request, give and understand basic information, read simple short texts, and write at a simple sentence level.	4 (4-0-8)
ICML 132	Elementary Chinese II Prerequisites: ICML 131 or placement test More fundamental grammar and basic vocabulary allowing the students to hold simple short conversations on common topics and situations, express opinions in a simple form, read short texts and write at a short paragraph level.	4 (4-0-8)
ICML 133	Elementary Chinese III Prerequisites: ICML 132 or placement test Consolidation of the acquisitions of ICML 131 and 132 and further mastering of fundamental grammar and basic vocabulary in order to allow the students to fully achieve a standard elementary level of proficiency.	4 (4-0-8)
ICML 141	Elementary Spanish I Prerequisite: None (placement test required for students with prior knowledge) Elements of fundamental grammar and basic vocabulary allowing the students to request, give and understand basic information, read simple short texts, and write at a simple sentence level.	4 (4-0-8)
ICML 142	Elementary Spanish II Prerequisites: ICML 141 or placement test More fundamental grammar and basic vocabulary allowing the students to hold simple short conversations on common topics and situations, express opinions in a simple form, read short texts and write at a short paragraph level.	4 (4-0-8)

ICML 143	Elementary Spanish III Prerequisites: ICML 142 or placement test Consolidation of the acquisitions of ICML 141 and 142 and further mastering of fundamental grammar and basic vocabulary in order to allow the students to fully achieve a standard elementary level of proficiency.	4 (4-0-8)
ICML 160	Introduction to Thai Language and Culture Prerequisites: Exchange and visiting students, non full-time students Fundamental oral communicative skills: vocabulary and sentence structures related to common communication situations. Introduction to characteristic aspect of Thai culture and society.	4 (4-0-8)
ICML 161	Elementary Thai I Prerequisite: None (placement test required for students with prior knowledge) Elements of fundamental grammar and basic vocabulary allowing the students to request, give and understand basic information, read simple short texts, and write at a simple sentence level.	4 (4-0-8)
ICML 162	Elementary Thai II Prerequisites: ICML 161 or placement test More fundamental grammar and basic vocabulary allowing the students to hold simple short conversations on common topics and situations, express opinions in a simple form, read short texts and write at a short paragraph level.	4 (4-0-8)
ICML 163	Elementary Thai III Prerequisites: ICML 162 or placement test Consolidation of the acquisitions of ICML 161 and 162 and further mastering of fundamental grammar and basic vocabulary in order to allow the students to fully achieve a standard elementary level of proficiency.	4 (4-0-8)

| NATURAL SCIENCE |

ICNS 101	Introduction to Mathematics Limits and continuity; differentiation; curve sketching and some selected applications of the derivative; integration; area between curves; for non-science majors only.	4 (4-0-8)
ICNS 102	Principles of Mathematics A brief review of trigonometry; limits and continuity; differentiation and its techniques; derivatives of functions such as trigonometric, logarithmic, exponential and inverse trigonometric; sketching graph; applications of the derivative; antiderivative and integration area under a curve and between two curves.	4(4-0-8)
ICNS 103	Fundamental Mathematics Algebra and calculus with applications to business and economics; limits and continuity; derivatives and integral of functions of one real variable; partial derivatives; applied maxima and minima; linear algebra equations; matrices, operations on matrices, and matrix algebra.	4 (4-0-8)
ICNS 104	Fundamental Statistics Prerequisite: ICNS 103 Descriptive statistics, modern statistical methods as a basis for decision making in the face of uncertainty; probability theory; discrete and continuous distributions, sampling, hypothesis testing, estimation, simple linear regression analysis. All BA students are required to take this course as part of their GE requirement.	4 (4-0-8)
ICNS 105	Basic Mathematics 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.	4 (4-0-8)
ICNS 111	Fundamental Biology An introduction to the principles and methods of biology that directly impact humans and society; the diversity and development of life, origin of life, ecology and evolution.	4 (4-0-8)
ICNS 112	Integrated Biology/Principles of Biology Diversity and development of life, origin of life, cell, energy transformation, genetics, natural selection and evolution, and ecology.	4 (4-0-8)

ICNS 121	Fundamental Chemistry Basic principles and methods of chemistry, as applied to everyday life; basic knowledge of elements and compounds and their chemical reactions; solid, liquids and gases in terms of their impact on humans and the environment, including the air and water quality, global climate, and ozone depletion.	4 (4-0-8)
ICNS 122	Principles of Chemistry Atomic structure, chemical bonding, gases, solids and liquid solutions, stoichiometry, chemical equilibria, ionic equilibria, periodic properties of representative and transition elements.	4 (4-0-8)
ICNS 131	Fundamental Physics An introduction to the basic concepts of physics that impact individuals and society on a daily basis; physical quantities, electricity, magnetism, light and sound, with a focus on applying the information learned to everyday life.	4 (4-0-8)
ICPY 132	Principles of Physics 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.	4 (4-0-8)
ICNS 141	Computer Essentials Personal computer skill; prerequisite elementary exposure to hardware and software tools useful for basic practices on microcomputer applications; word processing; electronic mail; internet tools; spreadsheets; databases; presentation graphics; and external database retrieval.	4 (3-2-7)
ICNS 142	Internet Technology Application of Internet as an information tool, designing their own web site and web page; selection of Internet service provider; connecting different types of Internet, advance search techniques, HTML, cascading style sheets, and JavaScript.	4 (3-2-7)
ICNS 151	Basic Ecology Describes preliminary ecosystem, animal and plant communities, interdependent connections between living organisms and the environment. It includes issues of effect of human intervention, technological progress, ecological balances, and conservation. Laboratory and field trips are included.	4 (3-2-7)

ICNS 152	Southeast Asian Ecology Effect of development and population growth on the ecology in Southeast Asia especially in Thai ecosystems; ecological problems and potential solutions on governmental and individual levels.	4 (4-0-8)
ICNS 153	Ecosystems and Natural Resources Human impact on ecosystems and natural resources, global climate change, air quality, management of tropical forests including wildlife, and threats to biological diversity and effects on ecosystems; scientific approaches to investigating the causes and potential solutions.	4 (3-2-7)
ICNS 154	Science, Technology, and Environment 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.	4 (4-0-8)
ICNS 161	General Geology Concepts of how continents and land are shaped, rock formations, fossil fuels, underground water, minerals and gems, usage of resources and sustainability.	4 (4-0-8)
ICNS 162	Southeast Asian Geography Topography climate, and vegetation of the Southeast Asian region; social, political, business development in the Southeast Asian countries; effects of these developments on people's lives.	4 (4-0-8)
ICNS 171	The Scientific Approach and Society An examination of scientific methods through the work and ideas of outstanding scientific thinkers, the process of scientific reasoning and theory building, the impact of science on society.	4(3-2-7)
ICNS 211	The Science of Food 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.	4(4-0-8)

ICNS 252	Marine Biology Prerequisites: ICNS 112 or equivalent Natural history of marine animals, exclusive of protozoa and insects; types of environment in the ocean, 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 survey with laboratory exercises included.	4(3-2-7)
ICNS 253	Environmental Science Prerequisites: ICNS 112 or equivalent Ecological concepts related to the problems of pollution and their impact on agriculture and wildlife communities, natural resources, sustainable development and maintenance of clean environment.	4(4-0-8)
ICNS 254	Pollution Biology Causes and problems of pollution in the environment, including water, soil and air, analysis of the problems of pollution in Thailand.	4(3-2-7)
ICNS 256	Sustainable Development 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.	4 (4-0-8)
ICNS 257	Environmental Issues: Past, Present and Future 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.	4 (4-0-8)

| PHYSICAL EDUCATION |

ICPE 101	Physical Education: Badminton History, value, rules and regulations of badminton; practicing basic strokes and movement as well as playing skills.	1 (0-3-1)
ICPE 102	Physical Education: Basketball History, value, rules and regulations of basketball; practicing individual and team playing skills.	1 (0-3-1)
ICPE 103	Physical Education: Golf History, value, rules and regulations of golf; practicing the basics of driving, putting and other playing skills.	1 (0-3-1)
ICPE 105	Physical Education: Swimming Value, rules and regulations of swimming, with an emphasis on water safety; practicing various swimming strokes.	1 (0-3-1)
ICPE 106	Physical Education: Tennis History, value, rules and regulations of tennis; practice the basics of serving and hitting movements and other playing skills.	1 (0-3-1)
ICPE 107	Physical Education: Volleyball History, value, rules and regulations of volleyball; practicing individual and team playing skills.	1 (0-3-1)
ICPE 109	Physical Education: Social Dance Values of social dance; practicing basic movements as well as figures and skills of ballroom dancing.	1 (0-3-1)
ICPE 113	Physical Education: Modern Dance Demonstration, discussion, and practice of international forms of modern dance; comparison of modern dance with classical ballet.	1 (0-3-1)
ICPE 114	Thai Sports Science, art, practice and tradition of Thai forms of sports; practical exercises include Thai boxing and other Thai sports.	1 (0-3-1)
ICPE 115	Self Defense Non-violent self defense course, providing students with self confidence and skills in assault situations; practical exercises focus on skills needed in different conditions.	1 (0-3-1)

ICPE 116	Adapted Physical Activities Prerequisite: Students with disabilities A special course designed for students with physical disabilities and students who sustain injuries in regular physical education classes during the term; health behavior in well-being of the human body; principles of developing and maintaining physical fitness; total approach to fitness; cardio-respiratory conditioning, muscular strength and endurance and flexibility; practical exercises will be assigned to different students with different physical disabilities.	2 (1-2-3)
ICPE 117	Physical Education: Mind and Body Important Yoga and/or Tai Chi techniques which incorporate controlled rhythmic breathing, with a combination of bodily techniques and controlled rhythmic breathing.	1 (0-3-1)
ICPE 118	Physical Education: American Flag Football 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.	1 (0-3-1)
ICPE 119	Physical Education: Weight Training Muscular strength, muscular endurance and body composition in weight training; improving posture; increasing energy and stamina; enhancing agility and coordination; improving digestion; elimination and blood circulation; augmenting bone density; decreasing the risk of broken bones; helping to prevent osteoporosis.	1 (0-3-1)
ICPE 21	Physical Education: Soccer History, value, rules and regulations of soccer; practicing individual and team playing skills.	1 (0-3-1)
ICPE 122	Selected Topics in Sports History, value, rules and regulations of selected recreational and spectator sports.	1 (0-3-1)

| PHYSICS |

ICPY 132	Principles of Physics 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.	4 (4-0-8)
ICPY 210	General Physics I Electricity and magnetism, the Coulomb force; electric fields; electric potential, dielectric material, the Biot-Savart's law, Ampere's law, vector potential, scalar potential, magnetization, Faraday's law, Maxwell's equation, special theory of relativity.	4 (3-2-7)
ICPY 211	General Physics I Prerequisite: ICPY 132 Kinetic theory, heat, temperature, thermodynamics, oscillation, waves, electricity and magnetisms.	4 (4-0-8)
ICPY 212	General Physics II Prerequisite: ICPY 211 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.	4 (4-0-8)
ICPY 321	Intermediate Mechanics Newton's laws, linear and rotational dynamics, Euler angles and rigid body dynamics, small oscillation.	4 (4-0-8)
ICPY 322	Electricity and Magnetism Prerequisite: ICPY 211 The Coulomb force, electric fields and potential, Gauss' law, dielectrics, the Biot-Savart law, Ampere's law, the magnetic field and magnetic induction , vector and scalar potential, Faraday's law.	4 (4-0-8)
ICPY 323	Electrodynamics Prerequisite: ICPY 211 Maxwell's equation, wave equations, radiation fields, guided waves, cavity resonators, radiation from an oscillating dipole and a group of moving charges.	4 (4-0-8)

ICPY 324	<p>Wave and optics</p> <p>Prerequisite: ICPY 211</p> <p>Wave and vibration, mechanical and EM waves, reflection and refraction, lenses, pencil optics, physical optics.</p>	4 (4-0-8)
ICPY 325	<p>Advanced Optics</p> <p>Prerequisite: ICPY 324</p> <p>Diffraction, Fresnel diffraction, basic concepts of Fourier optics, optical coherence, propagation of light in anisotropic media, nonlinear optics.</p>	4 (4-0-8)
ICPY 326	<p>Special Topics in Optics</p> <p>Presentation and discussion on the optics topics which are in the current interests. Topics are varied from year to year.</p>	2 (2-0-4)
ICPY 327	<p>Laser and Applications</p> <p>Laser fundamentals, types of lasers, characteristics of laser beams, metrological and scientific applications, industrial applications, medical applications, military applications, optical information transmission and storage, and other applications.</p>	4(4-0-8)
ICPY 331	<p>Mathematical Methods in Physics I</p> <p>Special functions, Legendre functions, Hermite polynomials, Laguerre polynomials, Bessel functions.</p>	4 (4-0-8)
ICPY 332	<p>Mathematical Methods in Physics II</p> <p>Prerequisite: ICPY 331</p> <p>Complex variables, mappings, analytic functions, Cauchy's theorem, residue theory, conformal mapping.</p>	4 (4-0-8)
ICPY 333	<p>Mathematical Methods in Physics III</p> <p>Prerequisites: ICPY 331, ICPY 332</p> <p>Numerical analysis; error analysis, solution of nonlinear equation, interpolation and polynomial approximation, curve fitting, systems of linear equations, fast Fourier transform, numerical solution of differential equations, applications in research.</p>	4 (4-0-8)
ICPY 334	<p>Numerical Methods in Physics</p> <p>Basic Fortran algorithms; application of Fortran algorithms and numerical methods in solving a variety of physics problems.</p>	4 (4-0-8)
ICPY 341	<p>Integrated Laboratory in Physics I</p> <p>Laboratory practice on intermediate mechanics.</p>	2 (0-4-2)
ICPY 342	<p>Integrated Laboratory in Physics II</p> <p>Laboratory practice on electricity and magnetism.</p>	2 (0-4-2)

ICPY 343	Integrated Laboratory in Physics III Laboratory practice on electrodynamics.	2 (0-4-2)
ICPY 361	Quantum Mechanics I Prerequisite: ICPY 212 Review of old quantum theory, commutators, Schrodinger's equation, particle tunneling, harmonic oscillation system, the hydrogen problem, approximation method.	4 (4-0-8)
ICPY 371	Thermal Physics Prerequisite: ICPY 211 The laws of thermodynamics, heat engines, entropy, axiomatic formulation of thermodynamics.	4 (4-0-8)
ICPY 421	Theoretical Physics Hartree and Hartree-Fock theory, Thomas-Fermi model, Green's function of Schrodinger's equation, perturbation theory, Feynman's diagrams, Lehmann representation and quasi-particles, self-energy, quantum statistics, electron gas, phonons, polarons and plasmons.	4 (4-0-8)
ICPY 431	Surface Analysis Introduction to surface analysis, surface characterization, instrumentation, applications in research and industry	4 (4-0-8)
ICPY 435	Seminar in Physics I Each student is required to give a seminar on a physics topic of his/her interest.	2 (2-0-4)
ICPY 441	Senior Projects in Physics Teams of two to perform a set of experiments with emphasis on building theoretical understanding and becoming competent in data analysis and report writing.	6 (0-12-6)
ICPY 451	Analytical Mechanics Prerequisite: ICPY 321 Noninertial reference systems, rigid bodies in three dimension, principle of least action, Lagrangian Mechanics, and Hamiltonin theory.	4 (4-0-8)
ICPY 452	Statistical Mechanics Statistical physics, distributions, Boltzmann 's factor, partition and grand partition functions, Ising's model, quantum statistics.	4 (4-0-8)
ICPY 453	Theory of Relativity The Michelson-Morley experiment, the Lorentz transformation, Einstein's special theory of relativity, relativistic mechanics, relativistic wave equations.	4 (4-0-8)

ICPY 461	Quantum Mechanics II Prerequisites: ICPY 361 Time independent perturbation theory, Zeeman effect, variational method, time dependent perturbation theory, interaction of atom with radiation, second quantization, scattering theory, S matrix theory, Feynman's path integration.	4 (4-0-8)
ICPY 462	Molecular Dynamics Classical mechanics for molecular dynamics; operators and numerical methods; ensembles and observables; force fields; inter- and intramolecular interactions; electronic and molecular dynamics; Monte Carlo methods.	4 (4-0-8)
ICPY 471	Atomic and Molecular Physics Prerequisite: ICPY 361 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.	4 (4-0-8)
ICPY 472	Solid State Physics 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.	4 (4-0-8)
ICPY 473	Nuclear and Particle Physics Prerequisite: ICPY 212 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.	4 (4-0-8)
ICPY 474	Astrophysics Fundamental astronomical parameters, Orbit theory, Potential theory, Stellar kinetic theory, Stellar structure and evolution.	4 (4-0-8)
ICPY 475	Plasma Physics Saha's formula, elementary statistical interpretation, guiding center motion. Maxwell's equation approach, Vlasov equations, Magnetohydrodynamic equations.	4 (4-0-8)
ICPY 476	High Energy Physics Introduction to high energy physics, applications in research and industry.	4 (4-0-8)
ICPY 477	Special Topics in Nuclear Physics Presentation and discussion on the nuclear physics topics of current interests. Topics are varied from year to year.	2 (2-0-4)

ICPY 478	Advanced Topics in Solid State Physics This course is organized to give lecture and discussion on the recent advanced research in solid state physics.	4 (4-0-8)
ICPY 481	Nanomaterial Physics Introduction to nanotechnology, definition and development, effect of size, bottom up approach, self assemble, quantum mechanics and quantum nanostructure, nanomaterial, nanoparticle, nanotube, molecular mimic, molecular simulation, biomimetic, protein engineering, DNA structure as an information transfer, drug delivery system, nanoelectronics and quantum electronic devices, molecular electronics, light interaction and nanodevices, fabrication of nanodevices, equipment used in nanostructures, scanning tunneling microscope, atomic force microscope and surface analysis, future application.	4 (4-0-8)
ICPY 482	Special Topics in Nanomaterials Presentation and discussion on the nanomaterials topics of current interests. Topics are varied from year to year.	2 (2-0-4)
ICPY 490	Computational Physics Prerequisites: ICPY 331, ICPY 332 Basic mathematical operations: scattering by a central potential. Ordinary differential equations: stability, order and chaos in two- dimensional motion. Boundary value and eigenvalue problems: stationary solutions of the one-dimensional Schroedinger equation. Special functions and Gaussian quadrature: Born and eikonal approximations to quantum scattering. Matrix operations: determining nuclear charge densities. Elliptic partial differential equations: elliptic equations in two dimensions. Parabolic partial differential equations: the time-dependent Schroedinger equation. Monte Carlo methods: the Ising model in two dimensions. Fast Fourier transform: diffraction, image processing.	4 (4-0-8)
ICPY 491	Computer Programming for Physicists Introduction to programming, structural program development, program control, subprograms, array data types, pointers, structure data types and file processing, advanced programming and mathematical packages.	4 (4-0-8)
ICPY 492	Electronics Introduction to electronics, operational amplifiers, inductance and transformers, capacitance, AC circuits, network analysis, semiconductors, digital electronics, flip-flops, medium scale integration logic circuits, microcontrollers.	4 (4-0-8)

ICPY 493	Geophysics Introduction to geophysical techniques; seismic waves, seismic refraction interpretation; seismic reflection; acquisition, processing, waveform analysis and interpretation; earthquake seismology; characteristics of earthquakes, seismograms analysis, focal mechanism, travel-time curve for earthquakes.	4 (4-0-8)
ICPY 495	Special Topics in Geophysics Presentation and discussion on the geophysics topics of current interests. Topics are varied from year to year.	2 (2-0-4)
ICPY 496	Biophysics Introduction to biophysics, physical methods in the study of biological systems, including macromolecules, membranes, nerves, muscle, photosynthetic systems and visual systems, mathematical modeling of biological phenomena and applications of physics to biology and ecology.	4 (4-0-8)
ICPY 497	Special Topics in Biophysics Presentation and discussion on the biophysics topics of current interests. Topics are varied from year to year.	2 (2-0-4)

| PSYCHOLOGY |

ICSP 250	History and Systems of Psychology Prerequisite: ICSS 112 The historical development of psychology, philosophical perspectives, the social and political implications of psychological perspectives.	4 (4-0-8)
ICSP 251	Introduction to Developmental Psychology I Prerequisite: ICSS 112 An introduction to the life-span perspective of individual human development from conception through infancy and childhood to pre-adolescence; the processes of physical, cognitive, and psychological growth, including language and social development; child abuse and childhood psychopathology.	4 (4-0-8)
ICSP 252	Introduction to Developmental Psychology II Prerequisite: ICSS 112 Continuation of ICSS 221. 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.	4 (4-0-8)
ICSP 253	Introduction to Social Psychology Prerequisite: ICSS 112 Social cognition and social perception; attribution; attitudes, socialization, self-esteem and the self-concept; social behavior; interpersonal attraction; conformity and obedience; aggression; altruism; group processes; collective decision making; leadership.	4 (4-0-8)
ICSP 254	Theories of Personality Prerequisite: ICSS 112 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 behavior, psychodynamic and cognitive approaches.	4 (4-0-8)
ICSP 255	Introduction to Abnormal Psychology Prerequisite: ICSS 112 The definition, assessment, and classification of abnormal behavior; historical approaches to the understanding and treatment of abnormal behavior; psychotherapies and biological treatments.	4 (4-0-8)

ICSP 256	Industrial and Organizational Psychology Prerequisite: ICSS 112 Work-related attitudes, social influences at work; job satisfaction; work groups; matching workers with jobs.	(4-0-8)
ICSP 257	Educational Psychology Prerequisite: ICSS 112 An introduction to the study of human learning in the educational context; motivation, learning mechanisms, knowledge and intelligence, measurement and evaluation, teaching processes.	4 (4-0-8)
ICSP 258	Cross-Cultural Psychology Prerequisite: ICSS 112 The role of culture in the study of behavior; psychosocial development, social behavior, personality and cognition in cross-cultural perspectives; theoretical and methodological issues.	4 (4-0-8)
ICSP 350	Evolutionary Psychology Prerequisite: ICSS 112 An introduction to evolutionary psychology; behavioral strategies as a means of evolutionary survival; sex and reproduction; child rearing; conflict and aggression; cooperation; status, prestige and social dominance.	4 (4-0-8)
ICSP	351 Introduction to the Freudian and Psychodynamic Traditions Prerequisite: ICSS 112 The work of Sigmund Freud and his successors; Freud's theories, criticisms; Jung, Adler, later neo-Freudians.	4 (4-0-8)
ICSP 352	Prosocial and Antisocial Behavior Prerequisite: ICSS 112 The psychological and anthropological understanding of prosocial and antisocial behavior, altruism and helping, aggression and violence; theoretical approaches and debates.	4 (4-0-8)
ICSP 353	Clinical Psychology Prerequisite: ICSP 255 The use of psychological assessment methods and psychotherapeutic approaches in the treatment of individuals with psychological problems; theoretical approaches and issues.	4 (4-0-8)

ICSP 354	Psychological Testing Prerequisites: ICSP 254, ICSP 255 The measurement of individual psychological differences and characteristics, and of intra-individual differences across time; the major principles of test construction; ethical and social implications of test use.	4 (4-0-8)
ICSP 355	Drug Use and Behavior Prerequisite: ICSS 112 The psychology of drug use and addiction; types of psychoactive drugs, their use and neurological impact.	4 (4-0-8)
ICSP 356	Psychology of Emotion Prerequisite: ICSS 112 The experience of emotion; biological, developmental social and cognitive aspects of emotion; specific emotions in psychological perspective: happiness, sadness, fear, anger, shame, guilt, disgust, love, empathy/sympathy.	4 (4-0-8)
ICSP 357	Psychology of Motivation Psychological energization and the direction of goal-oriented behavior; biological, social and cognitive aspects of motivation; specific motivational systems: hunger, thirst, sex, aggression.	4 (4-0-8)

| SCIENCE |

ICSC 301	Data Collection and Laboratory Methods Data collection and testing of scientific hypotheses; a survey of techniques used to quantify information, including methods of measuring and sampling, and potential errors in data collection; laboratory techniques include planning and conducting experiments in the laboratory, developing skills in the laboratory, and controlling experimental, environmental variables.	4 (3-2-7)
ICSC 302	Scientific Research and Presentations Scientific method of discovery; developing a hypothesis and testing, interpretation of the results; proper format for presenting papers in public and in a scientific forum; practical sessions and participation in scientific seminars included.	4 (4-0-8)
ICSC 303	Statistics Prerequisites: ICNS 102 or equivalent Statistical ideas and concepts, probability and conditional probability, distribution functions, expected value, estimators, good estimators and hypothesis testing.	4 (4-0-8)
ICSC 304	Computer for Research Prerequisite: ICNS 141 Basic knowledge of various platforms of operating systems (DOS, UNIX, WINDOWS), files and data management, basic programming, application packages for statistical analysis and scientific plots, literature search through the on-line library computer system.	4 (3-2-7)
ICSC 333	Statistics for Research Prerequisites: ICNS 102 or equivalent Design of experiments, collection of data, presentation of data, descriptive statistics, elementary probability, normal distributions, estimation of parameters, hypothesis testing, analysis of variance, regression and correlation, analysis of frequencies, and non-parametric methods.	4 (4-0-8)

| SOCIAL SCIENCE |

ICSS 112	Introduction to Psychology A study of behavior and experience, biological bases of behavior; nervous system and psychogenetic; behavioral biology; sensation and perception; conditioning, learning and memory, motivation and emotion; reasonal and social development; psychopathology and psychotherapy.	4 (4-0-8)
ICSS 113	Introduction to Sociology Selected aspects of socialization and the sense of self, social action, interaction, social pattern and organization, culture and deviance; scientific and social methodology; nature of science; sociology as science; statistics and correlations, social stratification; social inequality, gender, social class and ethnicity, interaction of human, technology and society.	4 (4-0-8)
ICSS 114	Introduction to Economics General principles of economics; economic valuation, scarcity, and the price mechanism; factors determining the supply of and demand for goods; production factors in a competitive market; introduction to international trade.	4 (4-0-8)
ICSS 115	Introduction to Physical Anthropology The origins and distinctiveness of human species, human evolution; what make human distinctive from animals, Darwinian theory, development of human species, physical diversity; human beings and the environment: different adoptive strategies, cultural evolution, population growth, resource and pollution.	4 (4-0-8)
ICSS 116	Introduction to Political Science Examination of the assumptions, concerns, and major concepts in political science including historical developments and subjects in political philosophy; emphasis on modern concepts and empirical questions in political science.	4 (4-0-8)
ICSS 117	Introduction to Social Anthropology 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; ritual, meaning and cultural performances.	4 (4-0-8)
ICSS 118	Introduction to Mass Communications An introduction to mass communication and the mass media; the development, scope and functions of mass media; basic mass communication theories; the role and significance of the media in relationship to the individual and society.	4 (4-0-8)

ICSS 121	Southeast Asian Studies A general study of the Southeast Asian region: its distinctive characteristics, geography, societies and cultures, economies, and history; the development of "Southeast Asian Studies" as a discipline; an introduction to other courses on the region.	4 (4-0-8)
ICSS 133	Introduction to European History 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 and the Mediaeval period, the Renaissance and Reformation, the Scientific Revolution and the Enlightenment, the crisis of the Ancient Regime and the Age of Revolution, the Industrial Revolutions and economic transformation, nineteenth-century nationalism and the European wars of the 19th and 20th centuries, the European legacies and their worldwide impact.	4 (4-0-8)
ICSS 135	Introduction to Human Geography Relates the development of population and economics to cultural geography.	4 (4-0-8)
ICSS 136	Religious Experience and Traditions Phenomenon of religious experiences, major religious traditions in the West and East.	4 (4-0-8)
ICSS 137	Introduction to Archaeology Development of ancient civilizations and the methods used to uncover information about the past, important archaeological sites of Southeast Asia; field trips included.	4 (4-0-8)
ICSS 139	Tourism Geography 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 characteristics of selected world regions.	4 (4-0-8)
ICSS 202	Social Institutions Basic social institutions in comparative global perspective, marriage and the family, economy and work, politics and government, religion, education, sports and leisure, science, health and medicine, the mass media.	4 (4-0-8)
ICSS 203	Globalization and the Modern World Global structures and transformations of the late twentieth century; 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.	4 (4-0-8)

ICSS 211	Regional Geography of Southeast Asia Regional geography of Southeast Asia; its physical structure, climate and natural vegetation; human settlement and population; traditional, colonial, and modern economies; urbanization; political geography; and environment.	4 (4-0-8)
ICSS 212	History of Southeast Asia in the Modern Period 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.	4 (4-0-8)
ICSS 213	Southeast Asian Political Systems Historical and current situation of political systems throughout Southeast Asia, development of different systems in different nations, political areas of cooperation throughout the area.	4 (4-0-8)
ICSS 214	Southeast Asian Women The traditionally ascribed roles of women in the various societies of the region; social problems that pertain to women, such as divorce, abandonment, abuse, prostitution and legal and political access; global perceptions of Southeast Asian women; discussion of outstanding contemporary women in the region (Corizon Aquino, Aung San Suu Kyy, etc.).	4 (4-0-8)
ICSS 215	Southeast Asian Religious and Cultural Traditions Theravadan Buddhism, Islam, and Christianity in Southeast Asia; traditional Vietnamese religious synthesis; religion and the impact of colonialism; nationalism; secularizing ideologies; economic modernization; contemporary religious developments.	4 (4-0-8)
ICSS 221	Thai Society and Thai Culture People of Thailand and their culture; Royal Family, their history and works; religious tradition and belief; folklore; gender roles; national cuisine; entertainment (music, theater and dances); Asian and Western cultural propagation and changes in Thai society.	4 (4-0-8)
ICSS 222	Thai History An overview of Thai history and culture, history of Thailand, Neolithic period, Dvaravati, Srivijaya, Lopburi, Sukhothai, Ayudhaya, Thonburi-Bangkok, and modern Thailand.	4 (4-0-8)
ICSS 231	The History of East Asia in the Modern Age 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 world role of East Asia.	4 (4-0-8)

ICSS 234	The History and Culture of South Asia up to c.1500 History and culture of the Indian sub-continent; prehistory; the Indus Valley civilization; the settlement of the Indo-Aryans; empires and kingdoms; the Hindu traditions; emergence of Buddhism and Jainism; early impact of Islam; Indian influence in Southeast Asia.	4 (4-0-8)
ICSS 235	The History and Culture of South Asia since c.1500 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 in the Indian sub-continent since 1947.	4 (4-0-8)
ICSS 251	Developmental Psychology I 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 psychology.	4 (4-0-8)
ICSS 252	Developmental Psychology II Life-span perspective of individual human development from adolescence through adulthood to old age; processes of physical, cognitive, and psychological growth and change, including sexuality, adult relationships, social development, and aging.	4 (4-0-8)
ICSS 332	Introduction to Human Rights 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; protection of minorities; economic and cultural rights.	4 (4-0-8)

| SOUTHEAST ASIAN STUDIES |

ICSA 201	Geography of Southeast Asia The regional geography of Southeast Asia; its physical structure, climate and natural vegetation; human settlement; population; traditional, colonial, and modern economies; urbanization; political geography; the environment.	4 (4-0-8)
ICSA 202	Ecology of Southeast Asia An overview of the ecological systems of the region; selected issues, problems and areas are studied in greater detail.	4 (4-0-8)
ICSA 203	The History of Southeast Asia up to 1800 Archaeology in Southeast Asia; the earliest human presence; the emergence of the historic states and their development up to c. 1800; the impact of early Western colonialism.	4 (4-0-8)
ICSA 204	Modern History of Southeast Asia, c. 1800-Present An overall history of the region from the beginning of the modern colonial period through to independence; independence, liberalism, nationalism, communism, democratization and globalization.	4 (4-0-8)
ICSA 205	Religion in Southeast Asia Animism and popular religion; the different cultural traditions; Theravadan Buddhism, Islam, and Christianity in Southeast Asia; the traditional Vietnamese religious synthesis; religion and the impact of colonialism, nationalism, secularizing ideologies, and economic modernization; contemporary religious developments.	4 (4-0-8)
ICSA 206	Political Systems of Southeast Asia Southeast Asian nations and their political systems; constitutional concepts; government and administrative functioning; law making and enforcement.	4 (4-0-8)
ICSA 207	Contemporary History of Southeast Asia c. 1948-Present The history of the region since World War II, the impact of the Cold War and decolonization processes, power struggles amongst competing elites, Military authoritarianism and democratic experiments, the impact of globalization on the region.	4 (4-0-8)
ICSA	211 Economics of Southeast Asia Study of 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 relation; present economic trends.	4 (4-0-8)

ICSA 212	Peasant Societies in Southeast Asia Peasant communities in the different countries of the region, their social structures and patterns of life; contemporary problems and future prospects; their role in the wider society.	4 (4-0-8)
ICSA 213	Poverty and Rural Development in Southeast Asia 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.	4 (4-0-8)
ICSA 214	Women in Southeast Asia The traditionally ascribed roles of women in the various societies of the region; social problems that pertain to women, such as divorce, abandonment, abuse, prostitution and legal and political access; global perceptions of Southeast Asian women; discussion of outstanding contemporary women in the region (Corizon Aquino, Aung San Su Kyy, etc.).	4 (4-0-8)
ICSA 231	Southeast Asian Arts I A survey of the arts and music of the various societies of the region and their development; architecture, the fine arts, and folk traditions.	4 (4-0-8)
ICSA 232	Southeast Asian Literature I A survey of the literary tradition of the region with particular reference to specific works of literature; comparative studies of literary works from the various nations and localities.	4 (4-0-8)
ICSA 233	Dance and Theater in Southeast Asia An introduction to the traditions of dance, theater and puppet theater in Southeast Asia; their characteristic features, historical background and contemporary expressions.	4 (4-0-8)
ICSA 251	Thai Arts (SAS Majors) A survey of the history, features, and cultural context of the major forms of Thai arts, specifically painting, sculpture, and architecture.	4 (4-0-8)
ICSA 252	Thai Music (SAS Majors) An introduction to the study of Thai music; instruments; the musical tradition; Thai classical, folk, and modern music.	4 (4-0-8)
ICSA 253	Thai Society and Culture 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 divide.	4 (4-0-8)

ICSA 254	Introduction to Thai History An overview of Thai history from the Neolithic period to the present day.	4 (4-0-8)
ICSA 255	Thai Economic History The early economic structures of Sukhothai and Ayutthaya in a regional context; economic developments up to the 1850s; agriculture and trade; control of manpower; landownership; immigration; taxfarming; rural and urban economies; the impact of the Bowring Treaty; developments in the Thai economy since the 1850s; different economic theories; the military and the economy; the black economy; boom, crash, and recovery; development strategies; emphasis on the modern period.	4 (4-0-8)
ICSA 311	International Politics in Southeast Asia 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.	4 (4-0-8)
ICSA 312	Ethnicity and Nationalism in Southeast Asia 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.	4 (4-0-8)
ICSA 313	Economic History of Southeast Asia The history of economic developments in the region since the early kingdoms to modern times, the traditional economies of lowlanders and highlanders and of feudal kingdoms, the emergence of trade entrepots and the impact of Indian , middle Eastern and Chinese traders, colonial, export-oriented and state-controlled economies, impact of globalization.	4 (4-0-8)
ICSA 314	Economic Problems in Southeast Asia Prerequisite: ICSA 211 A seminar-based study of contemporary economic problems in Southeast Asia.	4 (4-0-8)
ICSA 315	Globalization in Southeast Asia A 300-level seminar-format course requiring students to produce and present a series of short research paper on the various social, economic and political impacts of globalization in the region over the last few decades, Focal points will include economic interpretation, labour issues, INGO activity, rural and urban development and popular culture.	4 (4-0-8)
ICSA 316	Democratization in Southeast Asia A 300-level seminar-format course requiring students to produce and present a series of short research paper on contemporary political developments in the region, Focal points will include civil society, media, political parties, political participation and related theory.	4 (4-0-8)

ICSA 321	Religion, State and Politics in Mainland Southeast Asia The Mainland Southeast Asian religions, Animism, Hinduism, Buddhism and Confucianism in theory and practice, the relationship between the religious authorities and the secular powers, political links and controversies, the role of religious teachings and communities in the wider society as in education, gender relations and the economy.	4 (4-0-8)
ICSA 322	Religion, State and Politics in Maritime Southeast Asia Religious life in maritime Southeast Asia, traditional religions and indigenous cosmologies, a historical review of the spread and localisation of world religions (Hinduism, Islam and Christianity) in the region, the growing importance of religious identities in the political arena of post-colonial maritime Southeast Asia.	4 (4-0-8)
ICSA 331	Southeast Asian Arts II Prerequisite: ICSA 231 The traditional arts of the region in more depth; the contemporary state of the arts in Southeast Asia, and the impact of modern and Western influences.	4 (4-0-8)
ICSA 332	Southeast Asian Literature II Prerequisite: ICSA 232 The literature of the region in more depth; discussion of some literary classics from the countries of the region; the contemporary state of literature in Southeast Asia, and the impact of modern and Western influences.	4 (4-0-8)
ICSA 421	Contemporary Issues in Burma Contemporary issues in modern day Burma (Myanmar) ranging from religious cults to refugee issues, women's issues, film industry and the economy.	4 (4-0-8)
ICSA 422	Contemporary Issues in Malaysia An in-depth examination of contemporary Malay politics, economics and society, Demographics, ethnicity, national and regional politics, Islam, media issues, business and labor, development issues, democratization and civil society.	4 (4-0-8)
ICSA 423	Contemporary Issues in Indonesia An in-depth examination of contemporary Indonesian politics, economics and society, Demographics, ethnicity, national and regional politics, Islam, media issues, business and labor, development issues, democratization and civil society.	4 (4-0-8)
ICSA 431	Urban Anthropology of Southeast Asia The origin and development of Southeast Asian cities; historical processes of urbanization and rural-urban migration; metropolitanization, demographic change, ethnicity, cultural pluralism and social stratification in urban space; social networks based on common residence, origin, religious affiliation and other social variables; slums, poverty and crime; suburbs and middle-class housing estates; social enclaves within cities: China towns, Little Indias and expatriate neighbourhoods; entertainment industries and prostitution; urban subcultures; globalization and the transfer of urban space.	4 (4-0-8)

| SPANISH |

ICLS 211	Pre-intermediate Spanish I Prerequisites: ICML 143, refresher course or placement test. Elements of complex grammar and vocabulary related to a variety of everyday contexts allowing the students to discuss familiar topics, express opinions in a more elaborate way, ask for clarification, read a wider variety of texts, and write simple letters or narratives.	4 (4-0-8)
ICLS 212	Pre-intermediate Spanish II Prerequisite: ICLS 211 More complex grammar and vocabulary allowing the students to hold a short conversation, ask for, understand and offer information in a broader variety of familiar topics, read more elaborate texts, and write longer letters or narratives.	4 (4-0-8)
ICLS 213	Pre-intermediate Spanish III Prerequisite: ICLS 212 Consolidation of the acquisitions of ICLS 211 and 212 and further mastering of complex grammar and vocabulary in order to allow the students to fully reach a standard pre-intermediate level of proficiency.	4 (4-0-8)
ICLS 311	Intermediate Spanish I Prerequisite: ICLS 213 Elements of advanced 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.	4 (4-0-8)
ICLS 312	Intermediate Spanish II Prerequisite: ICLS 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 situations, and read and write simple argumentative texts related to such contexts.	4 (4-0-8)
ICLS 313	Intermediate Spanish III Prerequisite: ICLS 312 Consolidation of the acquisitions of ICLS 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.	4 (4-0-8)

- ICLS 320** **Intermediate Spanish: Written Skills A** **4 (4-0-8)**
Prerequisite: ICLS 313
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.
- ICLS 330** **Intermediate Spanish: Oral Skills A** **4 (4-0-8)**
Prerequisite: ICLS 320
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.

| TELEVISION PRODUCTION |

ICTV 101	TV Production Techniques Prerequisite: ICEM 101 Introduction to basic principles of TV production: use of a single camera, lighting, sound, ENG, post-production equipment, and broadcasting system.	4 (0-8-4)
ICTV 102	Multi-Camera Production Prerequisites: ICEM 102, ICTV 101 Introduction to multi-camera production for basic TV programs (i.e. Talk Shows and Demonstration programs).	4 (0-8-4)
ICTV 201	TV Production Design Prerequisite: ICEM 102 Introduction to creating and developing a cohesive and coherent TV production: style and consistency.	4 (1-6-5)
ICTV 202	TV On-Location Production Prerequisite: ICTV 102 Introduction to and working principles of EFP (Electronic Field Production); characteristics of on-location shooting: constraints and benefits.	4 (0-8-4)
ICTV 203	TV Pre-Production Stages in pre-production: research, development of a viable concept for a production proposal, production planning, production management, and production assignments.	4 (1-6-5)
ICTV 204	TV Scriptwriting Prerequisite: ICEM 102 Introduction to TV scriptwriting: from conception to final script; study of script structure and practice writing various short program formats such as demonstration, news, feature, and variety shows.	4 (1-6-5)
ICTV 205	TV Production Procedures Prerequisites: ICTV 102 Application and practice in TV production procedures for in-studio and on-location shooting with an emphasis on directing.	4 (0-8-4)
ICTV 206	TV Scenery and Props Design Prerequisite: ICEM 102 Introduction to scenery and props: functions, design, and production.	4 (0-8-4)

ICTV 301	TV Post Production Prerequisite: ICTV 101 Introduction to the artistic and technical principles of video and audio editing: the manipulation of images using non-linear editing; the addition of sound to complement the images; special effects.	4 (0-8-4)
ICTV 302	TV News Gathering and Reporting Prerequisite: ICTV 101 Criteria of news value; principles and techniques in news gathering, writing and reporting.	4 (0-8-4)
ICTV 303	TV Marketing and Sales Prerequisites: ICEM 203, ICEM 301 Introduction to TV program marketing and sales: applying marketing concepts to a TV program; budgeting considerations; identifying and understanding target markets; sales and presentation tools and techniques.	4 (1-6-5)
ICTV 304	Directing TV Drama Prerequisite: ICEM 201 Artistic and technical approaches to TV drama, including blocking and acting for multi-camera shooting, camera angles and movements, shot planning, outside rehearsal, master cut and insert shooting, and continuity.	4 (0-8-4)
ICTV 305	Documentary Program Production Prerequisites: ICTV 101 A historical perspective of the documentary format; aesthetics and authorship; documentary theory; presentation styles and ethical considerations; production procedures.	4 (0-8-4)
ICTV 351	TV Drama Scriptwriting Introduction to the principles of dramatic storytelling: drama theory, plot structure, character design; character and plot development; dramatic elements.	4 (0-8-4)
ICTV 352	Wardrobe for TV and Film Introduction to the artistic and technical principles of wardrobe design, from the interpretation of the script to the completion of the wardrobe.	4 (0-8-4)
ICTV 353	Make-up for TV and Film Introduction to the principles of corrective and beauty enhancing make-up and hair design for TV and film.	4 (1-6-5)
ICTV 354	News and Current Affairs Program Prerequisite: ICTV 302 The process of news and current affairs program production: principles of news editing; news production team and management; nature of various types of news and current affairs program; presentation formats.	4 (0-8-4)

ICTV 355	Special Effects Make-up for TV and Film Introduction to special effects make-up; developing and creating an imaginative character with unique features; creating realistic injuries and marks.	4 (1-6-5)
ICTV 370	Seminar in Television Production Prerequisite: Third year or higher The course examines and finds solutions to chosen current issues or case studies in Television Production. Students are required to participate in supervised discussions supported by experienced lecturers.	2 (2-0-4)
ICTV 380	Selected Topics in TV Production Prerequisite: Third year or higher Selected topics including specific television genres, styles analysis, culture and television, global television and media, television criticism and theory, technological developments, detailed investigation of new or emerging trends in television, etc.; special subjects determined by student interest and available instructor or visiting faculty.	4 (0-8-4)
ICTV 381	Independent Study in TV Production A directed independent study tailored to fit individual interests in a specific area of TV production.	4 (0-8-4)
ICTV 399	International Field Study in TV Production Prerequisite: ICTV 301 Introduction to the management styles of international media corporations; international artistic and business trends, and international media markets; foreign broadcasting regulations and legal considerations; innovations and technology.	4 (0-12-4)
ICTV 401	TV Drama Prerequisite: ICTV 304 Advanced principles in producing TV drama from pre-production to post-production.	4 (0-8-4)
ICTV 455	Professional Internship in TV Production Supervised internship in the field through placement in local television companies.	4 (0-12-4)
ICTV 498	TV Production Final Project I Integration of knowledge, skills, and techniques acquired throughout the course of study in developing a TV program proposal and planning the production of the final project.	4 (0-12-4)
ICTV 499	TV Production Final Project II Prerequisite: ICTV 498 Production of the approved project including shooting, post-production, and screening.	8 (0-24-8)

| THAI |

ICLT 211	Pre-intermediate Thai I Prerequisites: ICML 163, refresher course or placement test. Elements of complex grammar and vocabulary related to a variety of everyday contexts allowing the students to discuss familiar topics, express opinions in a more elaborate way, ask for clarification, read a wider variety of texts, and write simple letters or narratives.	4 (4-0-8)
ICLT 212	Pre-intermediate Thai II Prerequisite: ICLT 211 More complex grammar and vocabulary allowing the students to hold a short conversation, ask for, understand and offer information in a broader variety of familiar topics, read more elaborate texts, and write longer letters or narratives.	4 (4-0-8)
ICLT 213	Pre-intermediate Thai III Prerequisite: ICLT 212 Consolidation of the acquisitions of ICLT 211 and 212 and further mastering of complex grammar and vocabulary in order to allow the students to fully reach a standard pre-intermediate level of proficiency.	4 (4-0-8)
ICLT 311	Intermediate Thai I Prerequisite: ICLT 213 Elements of advanced 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.	4 (4-0-8)
ICLT 312	Intermediate Thai II Prerequisite: ICLT 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 situations, and read and write simple argumentative texts related to such contexts.	4 (4-0-8)
ICLT 313	Intermediate Thai III Prerequisite: ICLT 312 Consolidation of the acquisitions of ICLT 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.	4 (4-0-8)

- ICLT 320** **Intermediate Thai: Written Skills A** **4 (4-0-8)**
Prerequisite: ICLT 313
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.
- ICLT 330** **Intermediate Thai: Oral Skills A** **4 (4-0-8)**
Prerequisite: ICLT 320
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.

| TOURISM AND HOSPITALITY MANAGEMENT |

ICBC 201	Business Communication I Communication theories, strategies for planning managerial communications, skills in oral and written reporting and persuading, new technologies in business communication, implications of those changes to organizations.	4 (4-0-8)
ICBC 202	Business Communication II Prerequisite: ICBC 201 More areas of Business Communication, job search, interview skills, sales negotiation skills.	4 (4-0-8)
ICMS 301	Management and Organizational Behavior Planning; development of objectives and plan; organizing work relationship; motivating and leading; actuating coordinated efforts; controlling and measuring progress and taking corrective action; the role of the administrator, interpersonal and intergroup processes, organizational change.	4 (4-0-8)
ICTM 200	Fundamental Accounting Business transactions and financial statements, evolution of accounting, recording and classifying financial transactions, preparation of financial statements, characteristics of various types of accounts, accounting principles, the usefulness and limitations of accounting information.	4 (4-0-8)
ICTM 201	Principles of Marketing Principles of business management, developing market strategy in business marketing and business customers, and real life business examples and case studies to demonstrate business marketing theories in practice.	4 (4-0-8)
ICTM 212	Introduction to the Travel Industry Prerequisite: 36 credits of General Education The evolution of the hospitality/tourism industry and its various components, operations of hotels/resorts; tour operators; travel agencies; attractions and transportation modes; addressing the political, social, and economical implications of tourism.	4 (4-0-8)
ICTM 210	Accounting for the Travel Industry Prerequisite: ICTM 200 The basics of accounting; special requirements of accounting within the Tourism Industry; coverage of the balance sheet, income statement, cash flow statement, journal entries, and year-end closing of accounts.	4 (4-0-8)

ICTM 211	Statistics for the Travel Industry Design of experiments, collection of data, presentation of data, descriptive statistics, elementary probability, normal distributions, estimation of parameters, hypothesis testing, analysis of variance, regression and correlation, analysis of frequencies, and non-parametric methods.	4 (4-0-8)
ICTM 213	Finance for the Travel Industry Prerequisite: ICTM 200 Introduction to the 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.	4 (4-0-8)
ICTM 214	Economics of Tourism Principles of economics, particularly microeconomics, and applied economic concepts, analysis and techniques to the international tourism and tourism industry; assessing the socio-economic behavior of economic agents comprising consumers, businesses, government and its agencies, particularly their choices and decision making; covering key economic areas of demand, supply, elasticity, costing, pricing and investment; assessing the impact of tourism on an economy and the impact of environmental factors.	4 (4-0-8)
ICTM 270	Consumer Behavior in Tourism Prerequisite: ICTM 212 The supremacy of the consumer, the factors influencing behavior; knowledge and involvement, attention and comprehension, attitudes and intentions; decision-making behavior; classical and operant learning; cultural influences; reference groups.	4 (4-0-8)
ICTM 307	International Travel & Tourism Prerequisite: ICTM 212 The development and organization of the international travel industry; the sociology of tourism.	4 (4-0-8)
ICTM 310	Event Management Prerequisite: ICTM 212 Planning, organizing and managing event activities and the event environment, the industry's stakeholders, event infrastructure, marketing, human resources, contingency planning, legal issues, strategic management, and research, analysis and evaluation.	4 (3-2-7)

ICTM 311	Sales and Marketing for the Travel Industry Prerequisites: ICTM 201, ICTM 212 The resources and variables available in developing a successful marketing strategy in the tourism industry; market research, advertising and promotion, sales techniques, and public relations; the tourism industry distribution network, and the integrated marketing efforts of the various components of the hotel and tourism industry.	4 (4-0-8)
ICTM 312	Human Resources Management for the Travel Industry Prerequisite: ICTM 212 An overview and survey of human resources management and personnel administration in the tourism industry; selection, staffing, labor relations, training and development of human resources and remuneration management in the tourism Industry	4 (4-0-8)
ICTM 313	Tourism Environments Prerequisite: ICTM 212 A comprehensive introduction to tourism planning and development; investigating impacts of tourism on economic, socio-cultural, and physical environments; exploring issues concerning host-visitor relationship, environmental analysis and audit, sustainable tourism.	4 (3-2-7)
ICTM 319	Ecotourism Studies Prerequisite: ICTM 212 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.	4 (3-2-7)
ICTM 320	Lodging Property Management Prerequisite: ICTM 212 Organizational structures; management and operation of hotels and resorts, and their various departments; emphasize on management concepts and the decision-making process.	4 (4-0-8)
ICTM 323	Front Office Management Prerequisite: ICTM 212 The essential knowledge and skills required for management in hiring front office employees and renting rooms within the hospitality industry; property management systems, reservations, yield management.	4 (4-0-8)

ICTM 324	Food and Beverage Management Prerequisite: ICTM 212 Food and beverage operations management within a hotel, pricing, inventory management, franchising, commercial kitchen, service for hotel and private clubs.	4 (4-0-8)
ICTM 325	Housekeeping Management Prerequisite: ICTM 212 Management of housekeeping duties within an establishment, supervision of staff, scheduling, use of different cleaning agents, safety within the work environment; housekeeping technology.	4 (4-0-8)
ICTM 330	Cultural Heritage Management Prerequisite: ICTM 212 Objectives and processes of cultural heritage development; development of ecotourism impacts and pitfalls of cultural tourism; planning, conservation and preservation of cultural tourism; application of information technology and information management for cultural tourism.	4 (4-0-8)
ICTM 331	Guide to Tourist Health and Safety Prerequisite: ICTM 212 Basic understanding of preventive tropical medicine with an emphasis on Southeast Asia; planning proper travel vaccine, chemo-or seroprophylaxis; determining real areas of risk; harmless animals versus poisonous ones; how to deal with the tropical climate; local food and drinks and where to get help when needed; practical tips for tour organizers and tour guides.	4 (4-0-8)
ICTM 341	Forest Tourism Management Prerequisite: ICTM 212 Compatibility between tourism, forestry and conservation; the management of natural resources, and the involvement of stakeholders and the community.	4 (3-2-7)
ICTM 352	Tourism and Hospitality Law Prerequisite: ICTM 212 The key principles of law applicable to tourism, hospitality, and related industries; Thai tourism legislation on business organizations and several international law issues such as consumer protection, product and service liability, employment, and law of access to the natural environment.	4 (4-0-8)

ICTM 370	Technology for Tourism Industry <p>The use of information systems in the tourism industry; the use of computers to facilitate both the flow and management of information in the industry, the flow and capture of information related to providing tourism and hospitality services; constant changes in information technology and their impact on the channels of distribution; the interdependence and cross-linking of the industry's systems along with the emergence of the Internet as another channel of information flow.</p>	4 (4-0-8)
ICTM 400	Tourism Business Management Prerequisite: ICTM 212 <p>The roles, sizes, structure, operations, management of tourism business organizations; relationships of tourism business organizations with a particular emphasis on exploring travel agencies, tour operators and wholesalers; corporate tourism management; incentive travel and meeting-convention planners.</p>	4 (4-0-8)
ICTM 401	Strategic Management for the Travel Industry Prerequisite: ICMS 301, ICTM 311 <p>Strategic issues in management; formulation and analysis of strategies; relationship between strategies and organizational structures; strategic thinking and managing change; pricing and distribution strategies; differences in strategies between sectors.</p>	4 (4-0-8)
ICTM 410	Passenger Transportation Management Prerequisite: ICTM 212 <p>A survey of surface, air, and water transportation; organization, operations, and regulatory and marketing aspects; examination of the inter-model concept; the social, economic, and political factors that have influenced government transportation priorities.</p>	4 (4-0-8)
ICTM 413	Operations and Quality Management Prerequisite: ICTM 212 <p>Delivering quality service to clients, training the travel industry's human resource component, the meaning and importance of quality, value of the customer and service quality, quality management process, its impact on organizations and the significance of service quality to tourism and hospitality concepts together with the mechanism of quality management approach to providing service excellence through several advancements in quality such as benchmarking and total quality management.</p>	4 (4-0-8)

ICTM 414	Ethics in Hospitality Operations Prerequisite: ICTM 212 Ethical foundation in business; fundamental theories of ethics; various ethical concepts and dilemmas in service industry for analysis and learning; essential process for self-evaluation and methods to test and apply the theories in their own working life.	4 (4-0-8)
ICTM 420	Sustainable Tourism Studies Prerequisite: ICTM 212 Concepts of sustainability that affect the tourism industry; the range of tourism developments designed to maintain environmental, social and economic well being of natural, built, and cultural resources; the inherent stability of natural ecosystems in order that certain parallels may be drawn and guiding principles applied to the management of tourism based projects.	4 (4-0-8)
ICTM 423	Seminar in Tourism Planning and Promotion Prerequisite: ICTM 212 Selected topics in tourism planning and promotion.	4 (4-0-8)
ICTM 428	Tourism Guide Prerequisite: ICTM 212 Preparation for qualified tour guides in Thailand, an overview of essential knowledge about Thailand: Thai geography, Thai foods, Thai art and society, Buddhism, ticketing, tour safety, and other such issues; participating in a field study.	4 (3-2-7)
ICTM 430	Managing Package Tourism Prerequisite: ICTM 212 The roles of major suppliers in the tourism industry in terms of their planning management operation of tour operators, and destination research; design itineraries; calculate and set the selling prices of tour packages.	4 (4-0-8)
ICTM 431	Rural Tourism Prerequisite: ICTM 212 Factors that determine successful rural tourism development and management of sites in an environmentally and culturally sensitive area.	4 (4-0-8)
ICTM 433	Tourism in Developing Countries Prerequisite: ICTM 212 Tourism development in developing countries and the impact it has socially and economically, health, international demand, and ecotourism in a case method manner.	4 (4-0-8)

ICTM 442	Hospitality Training Prerequisite: ICTM 212, ICTM 312 The training of hospitality staff in their assigned tasks, training methods and different teaching methodologies for adult education.	4 (4-0-8)
ICTM 461	Travel Industry Management: Internship I Prerequisite: ICTM 212 A one-trimester internship where students gain hands-on experience at the MUIC Training Center, also known as Salaya Pavilion Hotel, in consultation with an assigned advisor.	12 (0-48-12)
ICTM 462	Travel Industry Management: Internship II Prerequisite: ICTM 461 A one-trimester continuation of the first internship (ICTM 461) where students gain hands-on experience in the tourism industry in consultation with an assigned advisor.	12 (0-48-12)
ICTM 471	Seminar in Tourism Industry Prerequisite: ICTM212 Examining and creating solutions to the chosen current issues or case studies in the tourism and hospitality industry, particularly in the Asia Pacific region; conducting a tutorial discussion supported by experienced lecturers.	4 (4-0-8)
ICTM 472	Airline Business Management Prerequisite: ICTM 212 Airline organizations, airline regulations, airline routing, airline costs and revenue aircraft structure, operations and marketing aspects, low cost airline management. The impact of alliance and consolidation, the e-commerce revolution and sustainable airline development.	4 (4-0-8)
ICTM 473	Seminar in Service Management Prerequisites: ICTM 212, ICTM 461 Selected topics in service industries.	4 (4-0-8)
ICTM 474	Supervision in Hospitality Business Prerequisite: ICTM 212 Concepts of managing people in travel industry from a supervisor's viewpoint; techniques for increasing productivity and controlling labor costs, time management and managing change; effective communication and responsibilities of a supervisor in a hotel or food service operation; motivation of employees and resolution of conflicts with staff, guests and other departments. Case studies are explored.	4 (4-0-8)

ICTM 475	Introduction to Culinary Arts Prerequisite: ICTM 212 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.	4 (3-2-7)
ICTM 477	Hospitality Facilities Business Prerequisite: ICTM 212 An overview of the operation of hospitality facilities, including operating costs for various types of existing facilities, types and characteristics of major building systems, available technology, and the responsibilities of the engineering-maintenance department, renovation needs of hospitality facilities, key managerial aspects of renovations.	4 (4-0-8)
ICTM 478	Facilities Development and Planning in Hospitality Prerequisite: ICTM 212 An introduction to the issues and opportunities inherent in the development and planning of hospitality facilities, specifically hotels and restaurants constructions; the project development sequence; conceptual and space planning; architectural design criteria; construction management; interpretation of architectural design and consultant drawings; setting appropriate facilities requirements; understanding industry practice; implementing properties decisions within a balanced design, operations, and financial framework.	4 (4-0-8)
ICTM 480	Tourism and Hospitality Research Methods Prerequisite: ICTM 461 An introduction to research process and design, data collection, hypothesis testing, and reporting; featuring econometrics and other quantitative applications in business research; research on a topic related to the tourism and/or hospitality industry.	4 (4-0-8)



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