



SIU

Catalog

INTERNATIONAL UNDERGRADUATE PROGRAMS



2007-2008

SIU Committees

University Council (UC)

- 1. Prof. Dr. Surin Setamanit** **Chairman**
Chair Professor and Advisor, The Institute of Environmental Research, Chulalongkorn University
- 2. Dr. Dumrong Kasemset** **Vice Chairman**
Chairman of Executive Committee - Satellite & International Business, Shin Corporation Plc.
- 3. Mr. Bhanapot Damapong** **Member**
Chairman of the Board of Directors, Shin Corporation Plc.
- 4. Dr. Olarn Chaipravat** **Member**
Honorary Advisor, Fiscal Policy Research Institute
- 5. Mr. Paron Isarasena Na Ayudhaya** **Member**
Chairman of the Board of Directors, Shin Satellite Plc.
- 6. Prof. Dr. Pakorn Adulbhan** **Member**
Vice Chairman, The Royal Institute of Thailand
- 7. Prof. Dr. Naksitte Coovattanachai*** **Member**
Director, Royal Golden Jubilee PhD Program, Thailand Research Support Fund (TRF)
- 8. Prof. Oonta Nopakhun** **Member**
Professor of Non-Formal Education, Chulalongkorn University
- 9. Prof. Dr. Somchart Saponronnarit** **Member**
Professor of Energy Technology, KMUTT
Fellow of the Royal Institute of Thailand
- 10. Prof. Dr. Prida Wibulswasj** **Member**
President, Shinawatra University
- 11. Assoc. Prof. Dr. Chuvej Chansa-ngavej** **Member**
Dean, School of Management, Shinawatra University

Executive Committee (EC)

- 1. Prof. Dr. Prida Wibulswas** **Chairman**
President
- 2. Prof. Dr. Vutthi Bhanthumnavin** **Member**
Acting Provost
- 3. Assoc. Prof. Dr. Suravuth Pratishtananda** **Member**
Executive Vice President - Graduate Operation
- 4. Asst. Prof. Dr. Prinya Tantasawadi** **Member**
Acting Dean - School of Technology
- 5. Assoc. Prof. Dr. Chuvej Chansa-ngavej** **Member**
Dean-School of Management
- 6. Asst. Prof. Dr. Byaporn na Nagara** **Member and Secretary**
Vice President - Main Campus

Executive Review Committee (ERC)

- 1. Dr. Dumrong Kasemset** **Chairman**
Chairman of the Executive Committee, Satellite & International Business, Shin Corporation Plc.
- 2. Ms. Yingluck Shinawatra** **Member**
Chairman of the Executive Committee, SC Asset Group
- 3. Prof. Dr. Naksitte Coovattanachai** **Member**
Director, RGJ PhD Program, TRF
- 4. Prof. Dr. Prida Wibulswas** **Member**
President, Shinawatra University

Academic Review Committee (ARC)

- Prof. Dr. Prida Wibulswas** **Advisor**
President, Shinawatra University
- 1. Prof. Dr. Naksitte Coovattanachai*** **Chairman**
Director, Royal Golden Jubilee PhD Program, Thailand Research Support Fund (TRF)
- 2. Prof. Decha Boonkham*** **Member**
Emeritus Professor, Department of Landscape Architecture, Chulalongkorn University
- 3. Prof. Dr. Narasri Vaivanijkul*** **Member**
Director, Sasin Research Center, Chulalongkorn University
- 4. Prof. Dr. Pakorn Adulbhan*** **Member**
Vice Chairman, The Royal Institute of Thailand
- 5. Prof. Dr. Sawasd Tantaratana** **Member**
Director, Sirindhorn International Institute of Technology, Thammasat University
- 6. Prof. Dr. Somchart Saponronnarit*** **Member**
Professor of Energy Technology, KMUTT
Fellow of the Royal Institute of Thailand
- 7. Prof. Dr. Yongwimon Lenbury*** **Member**
Professor, Department of Mathematics, Mahidol University,
Fellow of the Royal Institute of Thailand
- 8. Prof. Dr. Vutthi Bhanthumnavin** **Member and Secretary**
Acting Provost, Shinawatra University
- 9. Prof. Dr. Damrong Khummongkol** **Member and Assistant Secretary**
Deputy Dean - School of Technology, Shinawatra University

*Also members of Academic Rank Assessment Committee (ARAC)

Academic Committee (AC)

- Prof. Dr. Prida Wibulswas** **Advisor**
President
- 1. Prof. Dr. Vutthi Bhanthumnavin** **Chairman**
Acting Provost
- 2. Prof. Dr. Damrong Khummongkol** **Member**
Academic Coordinator - Science & Technology Studies
- 3. Assoc. Prof. Dr. Chuvej Chansa-ngavej** **Member**
Program Chairperson - Business administration
- 4. Assoc. Prof. Dr. Kanittha Navarat** **Member**
Acting Director - Liberal Arts and Language Center
- 5. Asst. Prof. Dr. Apichat Praditsmanont** **Member**
Program Chairperson - Architectural Technology
- 6. Asst. Prof. Dr. Chutiporn Anutariya** **Member**
Program Chairperson - Computer Science
- 7. Asst. Prof. Dr. Chuthatip Maneepong** **Member**
Academic Coordinator - Humanities & Social Science Studies
- 8. Dr. Pruittipong Thaicham** **Member**
Acting Program Chairperson - Management Technology
- 9. Asst. Prof. Dr. Prinya Tantasawadi** **Member and Secretary**
Program Chairperson - Telecommunications Engineering

Academic Calendar 2007 – 2008

	Semester I	Semester II	Summer
Orientation for new students	15 June 2007	2 November 2007	-
Meet with study advisor	15 June 2007	2 November 2007	-
Regular registration period	27 Apr. – 15 Jun. 2007	10 Sep. – 2 Nov. 2007	11 Feb. – 21 Mar. 2008
Regular payment of fees period	27 Apr. – 15 Jun. 2007	10 Sep. – 2 Nov. 2007	11 Feb. – 21 Mar. 2008
Class commences	18 June 2007	5 November 2007	24 March 2008
Late registration period (100 Baht/Day late registration charge)*	18 – 29 June 2007	5 – 16 November 2007	24 – 28 Mar. 2008
Late payment of fees period	18 – 29 June 2007	5 – 16 November 2007	24 – 28 Mar. 2008
Last day for registration change (refundable)	29 June 2007	16 November 2007	28 March 2008
Last day for request to retain or gain back student status	29 June 2007	16 November 2007	28 March 2008
Last day for subject withdrawal without W being recorded (approved by advisor)	29 June 2007	16 November 2007	28 March 2008
Midterm examination period	6 – 10 Aug. 2007	17 – 21 December 2007	to be decided by lecturer
Announcement of courses offered for the next semester	3 September 2007	18 January 2008	25 April 2008
Last day for subject withdrawal with W being recorded (approved by advisor)	14 September 2007	1 February 2008	16 May 2008
Last day of classes	5 October 2007	27 February 2008	27 May 2008
Final examination period	8 – 16 Oct. 2007	28 Feb. – 7 Mar. 2008	28 – 30 May 2008
Last day of semester	16 October 2007	7 March 2008	30 May 2008
Last day for submitting grades to Registration and Education Services Division	24 October 2007	14 March 2008	5 June 2008
Grade report displayed on-line	25 October 2007	17 March 2008	6 June 2008
Last day for graduation application	26 October 2007	17 March 2008	6 June 2008
Last day for pre-registration for next semester	2 November 2007	21 March 2008	-
Graduation Ceremony	21 July 2007	-	-

* Not applicable for new students

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An Introduction to SIU

Vision

Shinawatra University, SIU, aims to be a leading international university, with an emphasis on research, striving for excellence in learning and teaching, innovation, leadership, management, entrepreneurship, outreach and service with the highest ethical standards and social responsibilities.



Brief Historical Development

- 1996** The idea of establishing a private university to support development in Thailand and in the region was initiated by Dr.Thaksin Shinawatra and associates.
- 1999** The Ministry of University Affairs granted a license for setting up Shinawatra University (SIU).
- 2000** The first meeting of Shinawatra University Council (SIUC) was held on May 19.
- 2001** A Master's degree program in Business Administration and bachelor's degree programs in Built Environment, Business Administration and Computer Science were approved by the SIUC.
- 2002** Teaching at SIU first commenced in September with bachelor's degree programs in Built Environment, Computer Science, Business Administration and a master's degree program in Business Administration.
- 2004** Floors 15 & 16 of Shinawatra Tower III Building were approved by the SIUC for SIU's graduate operations. Master's degree programs in Information Technology, Management Technology, Systems Engineering and in Management were approved by the SIUC.
- 2005** Bachelor's degree programs in Architectural Technology and Management Technology, along with a doctoral degree in Technology and in Management, were approved by the SIUC.
- 2006** Graduation ceremony was held for the first batches of bachelors of business administration, computer science, telecommunications engineering and masters of science in information and management technology.

Past Chairpersons of SIU Council

- 2000-2001 Mr. Paron Isarasena Na Ayudhaya
- 2001-2004 Dr. Olarn Chaipravat
- 2004-2005 Dr. Thanong Bidaya (Acting)

Past Presidents

- 1999-2000 Prof. Dr. Purachai Piumsombun President
- 2000-2002 Dr. Sangsan Panich Acting President
- 2002-2003 Dr. Wittaya Manawanitcharoen Acting President
- 2003-2004 Dr. Thanong Bidaya Acting President

Missions

1. To provide multidisciplinary, interdisciplinary, and professional programs at the undergraduate and graduate levels to meet life-long learning needs.
2. To undertake pure and applied research, and creative endeavors which are consistent with the standards of academic excellence and management achievements.
3. To offer academic assistance for public services, economic development, and to offer technical-assistance activities designed to address the strategic needs of Thailand.
4. To provide comprehensive professional and management development programs and continuing education.
5. To strengthen the private sector through cooperative programs, research, collaboration, and services.




University Emblem



The university emblem represents the sun, which symbolizes the source of knowledge. It radiates an abundance of ingenuity and innovation through research. It contributes to the foundations of learning including ethical, moral, physical, and religious aspects.

 Gray symbolizes a love of discipline.

 Green symbolizes being one with society.

 Orange symbolizes new beginning through learning.

Tree

The *Couropita guianensis* Aubl., or Cannonball tree, of the Lecythidaceae family is a perennial plant that blossoms with flowers of a pink-orange color during the Buddhist Lent Season. There are 4 - 6 strong petals in each flower. The reason the tree is called cannonball is because after flowering, large brown fruit balls are formed, the size and shape of cannonballs.

Location of Shinawatra University

Operations of Shinawatra University are carried out at two locations:

1. **The Main Campus** is located at 99 Moo 10, Bangtoey, Samkok, Pathumthani 12160, about 50 kilometers from downtown Bangkok.
2. **The Graduate Building** is located in Bangkok, on the 15th and 16th Floors, Shinawatra Tower III Building, 1010 Viphavadi-Rangsit Road, Chatuchak, Bangkok 10900.



Facilities

Computer

Recognizing information technology as a cutting edge tool in management, good Internet and network connections are essential for a high quality management study environment. Shinawatra University undergraduate campus is well equipped with infrastructure supporting current information technology. The campus has a high speed network, for internal communications, and Internet connections for external communications. Students and faculty may access from fixed work stations or by wireless connection from anywhere on campus.



The university Internet connection to the outside world is at a speed of 2 Mbps. Every student is provided with an Internet account, including e-mail with a storage capacity of 100 MB.

In addition, a computer laboratory with 30 standard PCs is provided for general use. The laboratory is well wired at a speed of 100 Mbps. Additional peripherals are added depending upon requirements. A dial-up speed of 56.6 Kbps is available to all students with dial-in capability. Student accounts with passwords are set up upon completion of registration.

Library

Shinawatra University Library provides information resources and services to support teaching, learning, research, and edutainment. The Library is a learning center of educational media. It is also where a chronicle of the development of Shinawatra University is kept. The Shinawatra University Library uses the Library of Congress Classification System (L.C.) to organize the Library's collection. It has an automated library search system to support users through the Internet networks. This online service enables users to access many of the library's resources. The Library was the first in Thailand to implement RFID (Radio Frequency Identification) technology, called LIS Intelligence, in December 2002 to automate the book-handling processes, including systems for self-circulation, detection and inventory management.

The undergraduate library at the Pathumthani Campus, Shinawatra University, houses over 10,000 of the most current books and magazines from around the world. In addition to hard copies of the 24 top business, management and technology journals, including 11 computer science journals, each student has access to online databases covering current and back issues of over 1,500 journals. The on-site library is open 12 hours a day, 6 days a week. The online catalog and reference databases are accessible 24 hours a day over the Internet.

More details and up-to-date information on all library services can be found on the Library's website at <http://library.shinawatra.ac.th>

Dormitories

Air-conditioned dormitories are available on Pathumthani campus during the regular semesters and summer sessions. SIU provides separate facilities for men and women. Computer network connections, telephone lines, a refrigerator and hot/cold water system are available in each room. On each floor, students have access to a common room with TV. A kitchen and a laundry rooms are also available.

Each resident will be given 3 keys; room, desk and wardrobe. The students will be provided with a smart card, which gives them access to the dormitory. All undergraduate students are encouraged to stay on campus at least for the first year.



Accident Insurance

Accident insurance is provided for all full-time students upon enrollment. For further information, please contact the Office of Student Affairs. International students must have full health insurance coverage.

Student Activities

Shinawatra University promotes and facilitates students' participation in a variety of activities, which help them in building better career opportunities. Activities are usually organized through the Student Clubs, where executives are elected by a majority of votes. The clubs organize and manage various student activities that focus on academic affairs, cultural promotion, social development and sports. The University partially subsidizes funds on student activities.

Convenience Store

A convenience store on the 3rd floor of the main building is open every day from 7:00 a.m. to 9:00 p.m. during weekdays and 8:00 a.m. to 8:00 p.m. during weekends.

Cafeteria

The cafeteria is located next to the sky link. A variety of food is offered at reasonable prices. The cafeteria is open from 11:00 a.m. till 8:00 p.m.

Parking

Parking is available at dormitories on the main campus. Driver licenses are required for students to bring their cars to the main campus.

Admissions Requirements

1. M.6 certificate or equivalent high school certificate from accredited institution (12 years of schooling).
2. For non-native English speakers, working knowledge of English as evidenced by standard test scores.
3. Satisfactory marks in certain subjects, e.g. Mathematics, English from M.6 high school, National Entrance Examination, or Shinawatra University Placement Test. Students receiving low test scores may be recommended to take a remedial course in English or Mathematics. Details depend on each program requirement.

Scholarships and Government Loans

Scholarships

- **100%** on tuition fee for students who rank in the top 20% of their batches and top 10% of their batches in both Mathematics and English.
- **75%** on tuition fee for students who rank in the top 20% of their batches and top 10% of their batches in either Mathematics or English.

Partial Scholarships

Awarded by SIU automatically without any conditions.

- **50%** on tuition fee for students who rank in the top 40% of their batches
- **25%** on tuition fee for students who rank in the top 50% of their batches

** Subject to change without prior notices

Government Loan Programs

The Commission on Higher Education has arranged loan programs for local students to pay for their study, fees and personal expenses. Those who are interested can contact the Office of Student Affairs for more information.

Application

- Apply in person

- Submit your completed application form with all the required documents and a placement fee of 1,000 Baht to the Admissions Division.

- Apply by mail

- Submit the completed application form with required documents and placement fee to the Admissions Division.
- Provide a placement fee of Baht 1,000 by cashier's check, bank draft, or post check payable to "Shinawatra University".

- Apply via the Internet

- Go to http://reg.shinawatra.ac.th/registrar/application_form.asp and complete the on-line application.
- Print and submit a copy of the completed on-line application form together with required documents by mail to the Admissions Division.

Note: *The application process will only be completed once SIU receives all materials - the application form, required documents and placement fee.*

Tuition and Education Support Fees

All Undergraduate Programs

Student registration fee (for first entry)	Baht	1,500
Damage insurance (refundable)	Baht	10,000
Educational Support Fee/Semester	Baht	19,000
Tuition Fee/Credit	Baht	3,000

Other Fees

Dormitory (per semester)	(triple) Baht	12,000
	(double) Baht	18,000
	(single) Baht	36,000
Status maintenance (drop case only)	Baht	1,000
Educational Support Fee (9 credits)	Baht	9,500
(Summer session) (6 credits)	Baht	6,000
Add/Drop fee (per course)	Baht	100
Late registration fee (per day)	Baht	100
Program change fee	Baht	500
Graduate matriculation fee	Baht	1,000
Post-orientation fee	Baht	1,000
Reentry fee	Baht	1,000
Certificate fee	Baht	500
Retention fee/Semester	Baht	1,000

Methods of Payment

Alternative 1:

Bank Transfer with the specified amount (in Thai Baht) to **Bangkok Bank**,
Savings account, Soi Aree Branch,
Account Name: Shinawatra University,
Account Number: 127-4-18396-9.
Please fax a copy of the pay-in slip with your full name to Fax Number 02-599-3350 for a receipt.

Alternative 2:

Pay by cash or credit card (VISA, MASTER CARD, JCB) at the Office of Administration of Finance and Accounts, 1st Floor, Main Building

International Student Guides

Documentation

SIU advises international students to have all the necessary documents ready for immigration and enrolment purposes. When you arrive in Thailand you may be interviewed by immigration and health officials and we recommend that you keep the following documentation in your hand luggage:

- A valid passport
- Your visa and/or other entry clearance documents, if required
- Travel documents
- Health insurance, if any, from your country
- A letter of acceptance from Shinawatra University
- Enough cash for the first few days

Make sure that all the documents you have are consistent with one another. For example, some students may wish to be known by a "western" name or a nickname. If, however, documents from the University carry your "western" name or nickname, while your passport and visa carry your full name, this could cause problems and delays at the Immigration as the officers there will need to establish that both names actually refer to the same person.

Please note that once you are in Thailand you can not travel out of the country, unless you have received the permission to extend your stay in Thailand from the Commission on Higher Education of Thailand. Otherwise, your student visa will be invalid immediately. As soon as you arrive at the University, please contact the Admissions Division for other related matters.

Health Insurance

Students are strongly advised to purchase personal health insurance, either from your own country or from a company coordinated by Shinawatra University. If you have one from your own country, please submit a copy, showing coverage, to the Office of Student Affairs on arrival date.

Arrival

Please inform the Admissions Division of your flight details, so that we can arrange transportation and staff to pick you up at the airport.

Credits Transfer Guideline

General Guidelines

The University accepts transfer students provided that they are in good standing with the last institution attended and that they meet SIU's admission standards. The maximum number of credits transferable depends on the requirements of the specific program. To ensure proper processing of applications for admission, each candidate must provide an official transcript to Registration and Education Services Division. The request for transfer of credits will be approved by the School Dean under the following conditions:

- The course to be transferred must have been completed at a university or equivalent institution accredited by CHE, the Civil Service Commission, or equivalent overseas body/institution.
- The course content covers at least three quarters of that specified in the University's curriculum.
- Only courses with an earned grade of "C" or higher from English programs or "C+" or higher from programs conducted in Thai with the applicant's TOEFL score of 500 or higher, or equivalent, will be accepted for transfer.
- The total number of transferred credits shall not exceed three quarters of the total credits of all the courses required for the program.
- The transfer student must study at SIU for at least one year before graduation.

To expedite the processing of transfer credits request, one copy of each previous tertiary institution's educational catalogue should be submitted with the application.

Calculation of Cumulative Grade Point Average for Transfer Students

- Accreditation from other institutions with at least "C+" for Thai program and "C" for international program will be accredited but the grade will not be included in the calculation of Grade Point Average (GPA).

- Re-entry on the same program or transferred credits from other programs in SIU with at least "C" will be accredited and the grade will be calculated in GPA and will be appeared on the transcript.

Student Regulations

Study Regulations

1. Education System and Organization of Semester Periods

Undergraduate programs are organized on a bi-semester basis, using the credit system. In each academic year, there are two regular semesters and one optional summer session. Each regular semester lasts 16 weeks, while the summer session takes no more than 12 weeks, with one hour of study being considered of the same value in both cases.

The schedule for each semester/session is as follows:

- The first semester starts in June and ends in September
- The second semester starts in November and ends in February
- The summer session starts in March and ends in May

Academic programs are organized on a semester basis by taking the summer session as another regular semester. Each semester will then have 16 weeks of study with the total number of hours being not less than 48.

2. Credit Calculation

Lecture-type subjects or case studies, with a weekly class of one hour throughout a regular semester numbering not less than 15 hours in total, are taken as one credit.

Practical work, with 2 or 3 hours of training or experiments per week throughout a regular semester numbering 30 or 45 hours in total, is taken as one credit.

Practical training or field work training, with 3-6 hours per week throughout a regular semester numbering 45-90 hours in total, is taken as one credit.

3. Study Duration

3.1 For a 4-year full-time degree course, the minimum and maximum periods of 6 and 16 regular semesters respectively are allowed.

3.2 For a 4-year associate degree course, the minimum and maximum periods allowed, are 7 and 24 regular semesters respectively.

4. Registration

Before registration in each semester/session, students must obtain approval from their advisor first. Students must register by themselves according to the date, time and location specified by the University, or register through other means determined by the University. Exceptions may be granted in special circumstances, and approval from the Dean is needed. Late registration shall incur a fine at a rate announced by the University. Students who do not register in any semester must submit a request for study leave for that semester to the Registration and Education Services Division, via the Dean. They must pay a retention fee within 30 days after the semester starts.

Regular students must register, in a regular semester, for at least 9 credits and not more than 22 credits. In the summer session, a maximum of 10 credits is allowed. For cases that do not conform to the above, approval from the student advisor and Dean is required.

Associate students must register for at least 6 credits and not more than 18 credits in a regular semester. During summer sessions, a maximum of 10 credits is allowed. For other cases that do not conform to the above, approval is needed in the same way as for normal full-time students.

5. Evaluation System and Assessment

5.1 Evaluation System

Study achievement is evaluated using the letter grade system with the following equivalent values:

- Grade A has a numerical value of 4.00, meaning that the study result is excellent.
- Grade B+ has a numerical value of 3.50, meaning that the study result is very good.
- Grade B has a numerical value of 3.00, meaning that the study result is good.
- Grade C+ has a numerical value of 2.50, meaning that the study result is fair
- Grade C has a numerical value of 2.00, meaning that the study result is satisfactory.
- Grade D+ has a numerical value of 1.50, meaning that the study result is weak.
- Grade D has a numerical value of 1.00, meaning that the study result is very weak.
- Grade F has a numerical value of 0.00, meaning failure.

Besides the above, other types of letters may be used to indicate the study results;

W means the subject has been withdrawn with approval, or the University has withdrawn the subject without credits counting.

I means the evaluation is incomplete.

S means the result of the study is satisfactory and considered as a pass for the subject.

U means the result of the study is unsatisfactory, and the student has to repeat the subject in order to change the U grade to S.

AUD means registration for attending classes only and no credit is recorded.

ACC means a result of evaluation of courses transferred from accredited universities or re-entry cases

Notes:

Grade "F" is given for the following cases.

- 1) A student sits for the exam and fails.
- 2) A student is dishonest in the exam, and is penalized by being given grade "F" for the subject.
- 3) A student does not follow the conditions after receiving an "I" grade. This may be due to the student not adhering to the instructions to sit for the exam or undertake an assigned task set by the lecturer, so that the evaluation can be done and reported within 2 weeks of the beginning of the following semester.

Grade "I" is possible if a student comes across an unavoidable situation during the period close to or during examinations, such as contracting an illness for which sick leave has been granted, etc. A grade may also be given if the lecturer and program chairperson consider that the evaluation of the study result should be deferred, because the student has not completed all the work required for the subject.

The change of grade "I" to a normal grade shall be made after the student has attended the exam or completed all the required tasks. This must be done within 2 weeks since the beginning of the following semester; otherwise an "F" grade shall be given.

Grade "W" can be issued for the following cases.

- 1) A student requests to withdraw from a subject during the first 3 weeks from the registration date until 2 weeks before the final examination period begins for a regular semester, and the first 2 weeks from the registration date for a summer session. Permission for withdrawal from the study advisor is needed in both cases.
- 2) A student requests to withdraw from a subject one week before the final examination period begins. Permission for the withdrawal from the Program Chairperson is required.
- 3) A student withdraws from all the subjects following a request for leave of absence being approved by the Dean, after 8 weeks of study in a regular semester, or after 4 weeks of study for a summer session.
- 4) A student's request for sick leave on the date of examination, which is accompanied by doctor's certificate, is approved by the Dean.
- 5) A student is suspended from study by the President's order.

Grade "S" can be given when students pass the subject that they are required to take as a pre-condition, to gain basic knowledge before studying the subject in the main course. No credits will be counted in such a case as well as in the situation when they register for a subject to gain knowledge and do not want any credits.

Grade "U" will be given to students, when the study result is unsatisfactory.

The letters "AUD" are recorded when student registers for a subject on condition that no credits will be counted, and evaluation is not required. The above record will be valid if the student attends no less than 80 percent of the classes scheduled in that semester, otherwise it will be assumed that the student has withdrawn from the subject, and grade "W" will be given instead.

Grade "ACC" will be given to the transferred courses from accredited universities or re-entry cases.

5.2 Study Assessment

- 1) The study achievement of each student shall be assessed at the end of semester.
- 2) In estimating a student's grade point average, only the subjects for which the student has registered, sat examinations, and obtained A, B+, B, C+, C, D+, D or F grades will be counted.
- 3) In cases where a student repeats a subject, the number of credits together with the previous grade obtained in that subject must be included in the GPA calculation.
- 4) To calculate the semester GPA, the summation of each subject's credits times the earned grade, is divided by the total number of credits of all the subjects registered in that semester. The result is shown to two decimal points with no adjustments.
- 5) In calculating cumulative grade point average, the summation of each subject's credits times the earned grade for all the subjects registered in the program, is divided by the total number of credits of all the subjects. The result is shown to two decimal points without adjustments.
- 6) If a subject with "F" grade is re-graded, the earned credits of the same course will be counted only once.

5.3 Failing a Subject and Repeating

The guidelines for these two cases are shown as follows:

- 1) If students do not pass an exam according to the assessment criteria, it is regarded that they still have not passed the subject. They may be required to do some extra work as determined by the lecturer of that subject in order to raise their grade.
- 2) Students may register for a subject for which they previously earned an "F" grade.
- 3) Only the latest earned grade will be shown in the final transcript of records, and used in the final GPA calculation. (The subject credit will be counted only once.)
- 4) When students fail a subject, they must do the following:
 - If they fail and obtain an "F" grade in a non-elective subject, they must repeat the subject.
 - If they fail and obtain an "F" grade in an elective subject, they have two alternatives, either to repeat the subject or choose to study another elective subject instead.
- 5) In some cases, students pass all their subjects and earn the number of credits specified in the study program, but their cumulative GPA still does not reach 2.00 where the value is equal to or higher than 1.80, they may ask for permission to study more subjects in order to raise their cumulative GPA to 2.00. This can be done in several ways as indicated below.

- Register to study other subjects in their program which they have not studied before. The subjects must be on offer by the University. In such cases, approval from the President is needed.
- Repeat the subjects that require no prerequisite. Students must have studied the subjects before and obtained an average grade not higher than "D+".
- The registration of subjects in the above two cases can be done without conforming to the minimum credits rule in each semester. However, the above measures are allowed for up to two semesters.

5.4 Study Completion, Conferment of Degree and Honours Degree

- 1) Completion of study program: Students will complete their program of study and be conferred with their degree, when they have studied all the subjects and achieved the number of credits as specified in their program. Furthermore, their cumulative GPA must be equal to or greater than 2.00.
- 2) To qualify for a Degree or Diploma: Students who complete the study program and are eligible to be granted a degree must comply with the following qualifications:
 - They have passed all the subjects and achieved the number of credits as specified for the program.
 - They have obtained a cumulative GPA of at least 2.00.
 - They have shown good conduct.
- 3) To qualify for an Honours Degree:
 - 3.1 For a first-class honours degree, the student must possess the following qualifications:
 - They have obtained a cumulative GPA of at least 3.50, and never earned a grade below "C" or 2.00 in any core course.
 - They have passed all the subjects and achieved the total number of credits required for the program within 8 regular semesters.
 - 3.2 For a second-class honours degree, the student must attain the following:
 - They have obtained a cumulative GPA of at least 3.25, and never earned "F" in any core course.
 - The above achievement must be gained within 8 regular semesters.
 - 3.3 Students penalized for committing a deceitful act will be prohibited from graduation with an honours degree.

6. Student Status Classification

6.1 Defining Student Status

The status of each student shall be defined at the end of each regular semester except for the students who are in their first year at the University. In such cases, status will be defined at the end of the second semester starting from the date when they begin their study.

For summer sessions, the study results must be combined with results of the first regular semester in which the student has registered, in the defining of student status.

Students under probation refer to those who have a cumulative GPA less than 2.00.

Students who have a cumulative GPA less than 1.50 shall be dismissed, except for students who are in their first semester with the University.

Regular students who have completed 16 regular semesters or equivalent, but still have not achieved the required number of credits for their program of study, or have earned a cumulative GPA less than 2.00, will be dismissed.

6.2 Defining the Student's Year

The determination of the student's year shall be done at the end of academic year with the following criteria.

- 1) Students who have passed subjects with the total number of credits earned less than 33 will have the status of first year student.
- 2) Students who have passed subjects with the total number of credits earned 33 or higher, but less than 66 credits will have the status of second year student.
- 3) Students who have passed subjects with the total number of credits equaling 66 or higher but less than 99 credits will have the status of third year student.
- 4) Students who have passed 99 credits or higher will have the status of fourth year student.

6.3 Termination of Student Status

Students will have their status terminated if they fall into any of the following categories:

- They have obtained a cumulative GPA less than 1.50 except where they are in the first semester of year 1.
- They have obtained a cumulative GPA less than 1.80 in two consecutive semesters.
- They are unable to complete their program of study within the specified maximum period.
- They commit a serious breach of discipline as stated in the University regulations.
- Complete the program of study and is awarded a degree.
- The student dies or retires from study.

7. Study Completion, Conferment of Degree

Students who complete all the requirements in an undergraduate degree program will be eligible for the degree if they have the following qualifications.

- They have passed all the subjects and achieved the number of credits as specified in the program, with the grade in each subject being "D" or higher.
- They have obtained a total cumulative GPAX 2.00 or higher.
- For students whose mother tongue is not English and need to satisfy English language proficiency requirements, the proficiency requirement can be satisfied either upon admission or prior to graduation. The following are recognized as acceptable tests of English language proficiency: TOEFL score of at least 500 or equivalent score of TOIC, IELTS, CU-TEP or TU-GET.

Examination

To ensure that the University examination process is effectively and precisely implemented in line with the University regulations, the guidelines for student examinations are set as follows:

1. Candidates must:

- 1.1 dress properly as mentioned in Shinawatra University's regulations on students' uniform.
- 1.2 show their student identification card in every exam. Failure to obey the rule may mean students are stopped from taking the exam.
- 1.3 arrive at the exam room 15 minutes before the exam starts. However, it is the invigilator's decision to allow the candidates to enter the exam room. Those who arrive at the exam room later than 30 minutes after the exam starts will be disqualified.
- 1.4 stay in the exam room at least 30 minutes after the exam starts.
- 1.5 leave all books, lecture notes or any other materials outside the exam room unless they are permitted to be brought in.
- 1.6 obey instructions and follow the exam invigilator's advice strictly.
- 1.7 sign their name on the sign-up sheet.
- 1.8 write down their full name, ID number and seat number on question and answer sheets correctly and clearly.
- 1.9 not write or mark any sign or symbol on answer sheets unless instructed to do so. Any writing for the purpose of memorizing or otherwise may be written on the question sheets or blank sheets (provided by the invigilator).
- 1.10 remain seated and not cause any distraction to others in the exam room.
- 1.11 not talk, contact other candidates or other people outside the room and attempt any act of deceit including spying on other candidate's answer sheets or allowing others to see their own answer sheets.
- 1.12 not take question, answer or note sheets outside the exam room.
- 1.13 stop writing on answer sheets when the time is up when told by the invigilator to do so. Candidates may leave the exam room only after the invigilator has checked the number of question and answer sheets and permitted the candidates to leave.
- 1.14 not do anything that causes interruption to other candidates when leaving the exam room.
- 1.15 not violate any regulations. In case there is a legitimate reason for not following them, justify their actions with the exam invigilator.
- 1.16 not bring food and drinks into the exam room.
- 1.17 not talk to anyone during the examination.
- 1.18 raise their hand quietly in case of questions, and someone will be of assistance.
- 1.19 talk in English during the exam period.

2. A candidate who disobeys the invigilator's warning may be asked to leave the exam room and may not be allowed to complete the exam after warning has been given. This will result in zero marks for that candidate.

3. Disciplinary measures

3.1 If a student confesses to a deceitful act, the penalties will be as follows.

- 3.1.1 A letter grade "F" will be given for that subject, and
- 3.1.2 The student will be given the choice of either having their grades in other courses be at most "C" **OR** withdrawing from all subjects enrolled in that semester, and
- 3.1.3 The student will be prohibited from graduation with honours degree, and
- 3.1.4 Their parents will be summoned to acknowledge the probation.

Note: If a student attempts a 2nd offence, the student will be suspended from the university for one academic year in addition to the 4 items mentioned above.

3.2 If a student does not confess to a deceitful act, the Academic Disciplinary Committee (ADC) will investigate the case of the deceitful act and recommend penalties, if the student is found guilty. For the first deceitful act, the student will be penalized by (2.1.1) and (2.1.2) as mentioned above and will be suspended from the university for one semester. If the same student attempts a second offence, they will be expelled from the university.

3.3 Any attempt to be deceitful, will result in "F" grade for each particular subject in which fraud has been attempted. The candidate may be suspended from enrolment for up to one semester.

3.4 Any other misconduct which is specified in the examination regulations will lead to a penalty appropriate to the act. The level of punishment must not exceed the minimum disciplinary action imposed on deceitful acts mentioned in 3.1.

4. The invigilators must strictly adhere to the examination regulations to ensure that any act of deceit will not occur. They should also not hesitate from taking action if deceit has occurred, otherwise they will be considered to have committed a serious misconduct.

5. In cases of deceit or suspicion of a deceitful act by a candidate, the invigilator must record the incident and keep the evidence (if any) while allowing that candidate to continue with the test. A report of the incident should be forwarded to the Registration and Education Services Division for further procedure. In cases in which the test is not listed in the University's test schedule, the report must be sent to the Registration and Education Services Division within one working day.
6. A student who has been found guilty of being deceitful may file a petition through the Registration and Education Services Division within 7 days after the student has signed a acknowledgement on disciplinary announcement.

Student Disciplines

1. Disciplinary Rules

- 1.1 Students must strictly follow the University rules and regulations. Any acts of violation or disobedience will result in disciplinary actions.
- 1.2 Students must be polite, responsible for their own duties, and respect other people's rights and duties. Moreover, they have to follow moral and ethical rules and the code of conduct as described below. Inappropriate traditions or culture must not be practiced and they must have good manners. Any damaging acts must be avoided.
- 1.3 Students must be orderly, well-behaved, and unity with harmony.
- 1.4 Students must dress in a civil manner and in accordance with the University regulations.
- 1.5 Students must have ID cards with them while on the campus, and be able to show them when requested by a University officer or lecturer.
- 1.6 Students must respect and obey advice and warnings by lecturers and staff who are on duty, and must not show impolite or rude behavior to the University faculty and staff.
- 1.7 Students are not allowed to gamble or be involved in any gambling activities. Possession of gambling materials is also disallowed.
- 1.8 Students must not steal, embezzle or damage other people's or University properties.

- 1.9 Students are not allowed to sell or possess alcoholic drinks or illegal narcotics on campus. Taking alcoholic drinks and narcotic drugs which harm both the students and the University are also forbidden.
- 1.10 Students must not enter into activities that disturb the peace in the University.
- 1.11 Students are not allowed to possess or bring in any weapons, explosives or other materials that can be used as weapons or other illegal materials without permission. Fighting or squabbling with other students or other persons is also prohibited.
- 1.12 Students must not cheat or attempt to cheat or defraud when taking the exam.
- 1.13 Students must not possess or write, publish materials or draw pictures on any media, or make any statements or speeches that damage the reputation of others or the University.
- 1.14 Students are not allowed to stay in specified areas of the University's campus for more than the prescribed periods without permission.
- 1.15 Students must not incur debts which may cause damage to themselves or the University.
- 1.16 Students who are involved in any issues that require the attention of local officials or police must report to their advisors or the Office of Student Affairs as soon as possible.
- 1.17 Students who are sentenced to imprisonment, except for offenses caused by careless or negligent acts, will be considered to have committed serious misconduct.

2. Disciplinary Committee

In case a student commits an offense against the disciplinary rules, a disciplinary committee shall be set up by the Provost or Senior Vice President reporting to the President. The committee shall investigate the case and subsequently recommend the level of punishment to the University.

3. Punishment

Students who break the University rules and regulations will be penalized by the University. The level of punishment can be any of the following:

- 3.1 Verbal warning
- 3.2 Written warning and a copy of the warning letter is sent to their parents (After the first verbal warning)
- 3.3 Probation (After two written warnings for the offense)
- 3.4 Suspension of study
- 3.5 Dismissal
- 3.6 Other punishment that is deemed appropriate by the University
- 3.7 In case of serious misconduct and where the offense is against the law, the University will inform the appropriate authority to take legal action.

4. Inquiry Process and Decision on Punishment

- 4.1 The disciplinary committee shall have the authority to investigate the student's misconduct. After the inquiry has been concluded, the Committee will submit a report together with its recommendation to the University for an appropriated level of punishment.
- 4.2 During inquiry process, in order to obtain facts and evidence relating to the student's offense, the committee shall have the following power:
 - 4.2.1 To summon and question the student or others associated with the offense.
 - 4.2.2 To call for witnesses and evidence relating to the offense.
 - 4.2.3 To search any places in the University including the student's dormitory to collect all evidence relating to the offense.
 - 4.2.4 To ask the student, through the University, for a medical examination in case of suspicion that the student is a drug addict.
 - 4.2.5 To recommend the level of punishment to the President.
 - 4.2.6 To inform the student's parents and advisors after punishment

Pre-Sessional Courses

- Foundation English
- Basic Mathematics
- Basic Computer

School of Management

The School of Management at Shinawatra University provides professional programs in management at both the undergraduate and graduate levels. The professional programs are specially designed with an aim to produce graduates with qualifications, maturity, attitude, and skills that meet with the expectation of local and global business organizations. Courses are taught by high quality full-time and part-time faculty members whose educational background and research, teaching, and consulting experiences help to enhance the students' knowledge and relevant skills in modern management.

At present, the School of Management offers one undergraduate program, from which students can choose to be specialized in one of its two options:

- Bachelor of Business Administration (BBA) in Management
 - Options:
 - I Management
 - II International Business

The Business Administration (BA) Program is conducted at the Pathumthani Campus. Details of the program and its two options are given in the following pages.

Three graduate programs are offered at the Graduate Campus, Shinawatra Tower III Building, Bangkok. These programs are:

- Master of Business Administration (MBA) in Management
- Master of Science in Management (MSM)
- Doctor of Philosophy (PhD)
 - Options:
 - I Business Administration
 - II Management Science

For further information on the above three graduate programs, please see the graduate catalog.

School Committee

Dean	Chairman
(Associate Professor Dr. Chuvej Chansa-ngavej)	
Director of the PhD Program	Member
(Professor Dr. Vutthi Bhanthumnavin)	
Director of the MBA Program	Member
(Assistant Professor Dr. Pacapol Anurit)	
Director of the MSM Program	Member
(Associate Professor Dr. Supachok Wiriyaosol)	
Chairperson of the BA Program	Member
(Associate Professor Dr. Chuvej Chansa-ngavej)	
Dr. Nattharika Rittippant	Member and Secretary

Bachelor of Business Administration Program in Management

Curricular Title

Bachelor of Business Administration
in Management

บริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ

Degree Title

Full Title:

Bachelor of Business Administration
(Management)

บริหารธุรกิจบัณฑิต (การจัดการ)

Abbreviation:

BBA (Management)

บธ.บ.(การจัดการ)

Curricular Philosophy and Goals

The Business Administration (BA) Program in Management aims to cultivate young men and women with the qualifications, maturity, attitude, and skills to ensure that Thailand assumes a key role in the sustainable development of the global economy. The BA Program prepares future managers with knowledge and skills to succeed in technology-intensive industries operating in both Thailand international contexts. The BBA curriculum at Shinawatra University (SIU) emphasizes not only the concepts and business knowledge of management, but also a solid grounding in the communication skills, quantitative decision-making skills, and knowledge of humanities, social sciences, and science and technology to enable them to understand businesses in the historical, societal, and cultural contexts. The BA Program goes beyond the traditional undergraduate curriculum to develop key business skills in practical research and life-long learning, allowing them to immediately contribute to business performance upon graduation.

Curriculum Structure and Components

The students must complete a minimum requirement of 137 credits to graduate. The curriculum is divided into general education courses, business administration core courses, professional option courses, and free elective courses. Two professional options are offered:

- Option 1: Management
- Option 2: International Business

1. General Education Courses	41 credits
1.1 Humanities and Social Sciences	17 credits
1.2 English Language	12 credits
1.3 Basics in Science and Mathematics	12 credits
2. Business Administration Core Courses	45 credits
3. Professional Option Courses	45 credits
3.1 Professional Required Courses	30 credits
3.2 Professional Elective Courses	15 credits
4. Free Elective Courses	6 credits
Total	137 credits

1. General Education Courses	41	credits
1.1 Humanities and Social Sciences	17	credits
GE 1101 Principles of Economics	3(3-1)	
GE 1102 Law and Society	3(3-1)	
GE 1103 Management in Action	3(2-3)	
GE 1108 Sports	1(0-3)	
GE 1109 Music Appreciation	1(1-1)	
1.2 English Language	12	credits
GE 1003 Freshman Composition I	3(3-0)	
GE 1004 Freshman Composition II	3(3-0)	
1.3 Basics in Science and Mathematics	12	credits
GE 1206 Biological Science	3(3-1)	
GE 1207 Integrated Approach to Science and Technology	3(3-1)	
GE 1112 Humanities, an Integrated Approach	3(3-0)	
GE 1114 Thai Studies	3(3-0)	
or		
GE 1116 Greater Mekong Sub-region Studies	3(3-0)	
GE 3004 Business English I	3(3-0)	
GE 3005 Business English II	3(3-0)	
GE 1208 Environmental Studies	3(3-1)	
GE 1310 Basic Calculus	3(3-1)	

2. Business Administration Core Courses**45 credits**

MG 1001	Introduction to Business	3(3-1)	MG 2005	Business Information Technology	3(3-1)
MG 1004	Principles of Accounting I	3(3-1)	MG 2006	Production and Operations Management	3(3-1)
MG 1005	Principles of Accounting II	3(3-1)	MG 2301	Quantitative Analysis Techniques for Business	3(3-1)
MG 1006	Business Statistics	3(3-1)	MG 3001	Strategic Management	3(3-1)
MG 1007	Management Calculus	3(3-1)	MG 3002	Business Research Methods	3(3-1)
MG 2001	Principles of Marketing	3(3-1)	MG 3003	Business Ethics and Personal Development	3(3-1)
MG 2002	Business Finance	3(3-1)			
MG 2003	Managerial Economics	3(3-1)			
MG 2004	Human Resource Management	3(3-1)			

3. Professional Option Courses**45 credits****3.1 Option I: Management****3.1.1 Professional Required Courses****30 credits**

MG 2101	SME Management	3(3-1)	MG 3101	Risk and Insurance Management	3(3-1)
MG 2102	Business Communication and Negotiation	3(3-1)	MG 3102	Business Development Study	3(3-1)
MG 2103	Entrepreneurship	3(3-1)	MG 3103	Business Law and Taxation	3(3-1)
MG 2104	International Business	3(3-1)	MG 3501	Management Information Systems	3(3-1)
MG 3004	Management Internship	0(0-40)	MG 4101	Entrepreneurship Clinic	3(0-9)
			MG 4102	Seminar in Entrepreneurship	3(0-9)

3.1.2 Professional Elective Courses**15 credits**

(Students choose five courses from the following list.)

CS 3004	Computer Models for Business Decisions	3(2-3)	MG 3201	Global Economic Analysis	3(3-1)
MG 2201	Macroeconomics	3(3-1)	MG 3301	Project Management	3(3-1)
MG 2202	Monetary Theory and Policy	3(3-1)	MG 3302	Profit Planning and Control	3(3-1)
MG 2302	Business Decision Analysis	3(3-1)	MG 3303	Logistics and Supply Chain Management	3(3-1)
MG 3104	Finance and Accounting for Entrepreneurs	3(3-1)	MG 3401	Employment Procedure and Evaluation	3(3-1)
MG 3105	Entrepreneurial Leadership	3(3-1)	MG 3402	Business Psychology	3(3-1)
MG 3106	International Marketing Management	3(3-1)	MG 3502	Marketing and Electronic Commerce for Entrepreneurs	3(3-1)

3.2 Option II: International Business**3.2.1 Professional Required Courses****30 credits**

CS 3801	Information Technology Laws, Regulations, and Ethics	3(3-0)	MG 3106	International Marketing Management	3(3-1)
MG 2101	SME Management	3(3-1)	MG 3201	Global Economic Analysis	3(3-1)
MG 2102	Business Communication and Negotiation	3(3-1)	or		
MG 2103	Entrepreneurship	3(3-1)	MT 3304	Operations Research	3(3-0)
MG 2104	International Business	3(3-1)	MG 3303	Logistics and Supply Chain Management	3(3-1)
MG 3004	Management Internship	0(0-40)	MG 4103	Seminar in International Business	3(0-9)
MG 3103	Business Law and Taxation	3(3-1)			

3.2.2 Professional Elective Courses**15 credits**

(Students choose five courses from the following list.)

CS 3004	Computer Models for Business Decisions	3(2-3)	MG 3301	Project Management	3(3-1)
MG 2201	Macroeconomics	3(3-1)	MG 3302	Profit Planning and Control	3(3-1)
MG 2202	Monetary Theory and Policy	3(3-1)	MG 3401	Employment Procedure and Evaluation	3(3-1)
MG 2302	Business Decision Analysis	3(3-1)	MG 3402	Business Psychology	3(3-1)
MG 3102	Business Development Study	3(3-1)	MG 3501	Management Information Systems	3(3-1)
MG 3104	Finance and Accounting for Entrepreneurs	3(3-1)	MG 3502	Marketing and Electronic Commerce for Entrepreneurs	3(3-1)
MG 3105	Entrepreneurial Leadership	3(3-1)			

4. Free Elective Courses**6 credits**

Students can freely select any graded course offered by any academic unit of the university to satisfy 6 credits of free elective requirement.

School of Technology

The School of Technology at Shinawatra University provides professional programs at both the undergraduate and graduate levels. There are two programs: Computer Science (CS) and Management Technology (MT) programs.

The CS program is designed with an aim to provide strong foundations for computing, software development and communication systems, in conjunction with state-of-the-art methods and techniques for development of information-technology-based business solutions and management of computer networks.

Management Technology is an integrated understanding of economics, environment, information system, science and engineering. The Management Technology program is designed to produce high-quality graduates equipped with such an interdisciplinary subject and capable of managing advanced technologies emerging dynamically in various industrial and commercial fields. The graduates will have abilities to analyse and design systems which integrate technical, economical, environmental and social aspects for all kinds of transactions and activities

Laboratories

The CS program has several laboratories: computer laboratory, network laboratory, microprocessor laboratory, electronics and circuits laboratory and communication system laboratory. They are well equipped for both teaching and research.

The MT program has several laboratories: chemistry laboratory, biology laboratory, CAD/CAM laboratory, and architectural and environment design studio. They are well equipped for both laboratory teaching and research.

At present, the School of Technology offers two undergraduate programs:

1. Computer Science Program with four areas of specialization:

- **Bachelor of Science Program in Computer Science**

- Option 1: Computer Science
- Option 2: Software Engineering
- Option 3: Communication and Information Systems
- Option 4: Computer Applications for Businesses and Industries

2. Management Technology Program with four areas of specialization:

- **Bachelor of Science Program in Management Technology**

- Option 1: Architectural Technology Management
- Option 2: Engineering Management
- Option 3: Food and Biotechnology Management
- Option 4: Management Information Systems

The undergraduate program is conducted at Pathum Thani Campus. Details of this program and the three options are given in the following pages.

Three graduate programs are offered at the Graduate Building, Shinawatra Tower III Building, Bangkok. These programs are:

- **Master of Science Program in Information Technology**

Options:

- I Management Information Systems
- II Software Engineering

- **Master of Science Program in Management Technology**

Options:

- I Built Environment Management
- II Energy & Environment Management
- III Sustainable Development and Environment Management

- **Doctor of Philosophy Program in Technology (PhD)**

Options:

- I Management Technology
- II System Engineering
- III Information Technology

For further information of these graduate programs, please see the graduate catalog.

School Committee

Dean	Chairman
(Assistant Professor Dr. Prinya Tantaswadi)	
Deputy Dean	Vice Chairman
(Professor Dr. Damrong Khummongkol)	
Director of the PhD Program	Member
(Professor Dr. Vutthi Bhanthumnavin)	
Chairperson of Telecommunications Engineering Program	Member
(Assistant Professor Dr. Prinya Tantaswadi)	
Chairperson of Computer Science Program	Member
(Assistant Professor Dr. Chutiporn Anutariya)	
Chairperson of Management Technology Program	Member
(Dr. Pruitipong Thaicham)	
Chairperson of Architectural Technology Program	Member
(Assistant Professor Dr. Apichat Praditsmanont)	
Program Coordinator	Member
(Assistant Professor Dr. Chuthatip Maneepong)	
Ms. Photchanan Ratanajaipan	Member and Secretary

Bachelor of Science Program in Computer Science

Curricular Title

Bachelor of Science Program in Computer Science

วิทยาศาสตร์บัณฑิต สาขาวิชาวิทยาการคอมพิวเตอร์

Degree Title

Full Title:

Bachelor of Science (Computer Science)

วิทยาศาสตร์บัณฑิต (วิทยาการคอมพิวเตอร์)

Abbreviation:

BSc (Computer Science)

วท.บ. (วิทยาการคอมพิวเตอร์)

Curriculum Structure and Components

The students must complete a minimum requirement of 139 credits to graduate. The curriculum is divided into four areas of specialized options, i.e.,

- Option 1: Computer Science
- Option 2: Software Engineering
- Option 3: Communication and Information Systems
- Option 4: Computer Applications for Businesses and Industries

Curricular Philosophy and Goals

Computer science is a discipline pertaining to the research and development of computing and information systems. Computer science graduates are instrumental to the advancement of the field of computer science by contributing to the design, implementation, and maintenance of computing systems as well as the development of new algorithms, languages, and other tools necessary to serve the computing needs of both local and international communities.

The goal of this program is to produce computer science graduates who will eventually become leaders in the creation and implementation of new techniques and products in the fields of computer and information technology. This requires that the students possess fundamental knowledge, technical breadth, and communication skills as well as leadership quality, professionalism, ethics, and moral standards. With all of these qualities, the graduates will be able to assume professional and societal responsibilities that are conducive towards the well being and advancement of both local and international communities.

1. General Education Courses	47	credits		
1.1 Humanities and Social Sciences	17	credits		
1.2 English Language	9	credits		
1.3 Basic Courses in Science and Mathematics	21	credits		
2. Computer Science Courses	86	credits		
2.1 Compulsory Core Courses	56	credits		
2.2 Specialized Courses	24	credits		
2.3 Specialized Electives	6	credits		
3. Free Electives	6	credits		
Total	139	credits		
1. General Education Courses	47	credits		
1.1 Humanities and Social Sciences	17	credits		
GE 1101 Principles of Economics	3(3-1)		GE 1112 Humanities, an Integrated Approach	3(3-0)
GE 1102 Law and Society	3(3-1)		GE 1113 Social Sciences, an Integrated Approach	3(3-0)
GE 1103 Management in Action	3(2-3)		GE 1114 Thai studies	3(3-0)
GE 1108 Sports	1(0-3)		GE 1116 Greater Mekong Sub-region Studies	3(3-0)
GE 1109 Music Appreciation	1(1-1)			
1.2 English Language		9		credits
GE 1003 Freshman Composition I	3(3-0)		GE 3003 Technical Writing	3(3-0)
GE 1004 Freshman Composition II	3(3-0)			

1.3 Basic Courses in Science and Mathematics**21 credits**

GE 1205	Physical Science	3(3-1)	GE 1208	Environmental Studies	3(3-1)
GE 1206	Biological Science	3(3-1)	GE 1304	Calculus I	3(3-1)
GE 1207	Integrated Approach to Science and Technology	3(3-1)	GE 1306	Introduction to Statistics	3(3-1)
			GE 1307	Project Methods	3(2-3)

2. Computer Science Courses**86 credits**

Professional computer science courses are divided into compulsory core courses, specialized courses, and specialized electives.

2.1 Compulsory Core Courses**56 credits**

GE 1305	Calculus II	3(3-1)	CS 2232	Operating Systems Laboratory	1(0-3)
CS 1001	Programming Fundamentals	3(3-0)	CS 2300	Data Communication and Networking	3(3-0)
CS 1031	Programming Fundamentals Laboratory	1(0-3)	CS 2331	Data Communication and Networking Laboratory	1(0-3)
CS 1002	Object-Oriented Programming Paradigm	3(2-3)	CS 2505	Computer Graphics and Multimedia	3(3-0)
CS 1003	Data Structures and Algorithms	3(3-0)	CS 2700	Databases	3(3-0)
CS 1105	Discrete Mathematics for Computer Science	3(3-0)	CS 3000	Object-Oriented Software Development	3(2-3)
CS 1300	Internet and the World Wide Web Technologies	3(2-3)	CS 3300	Service-Oriented Architecture	3(2-3)
CS 2001	Linear Algebra	3(3-0)	CS 3801	Information Technology Laws, Regulations, and Ethics	3(3-0)
CS 2200	Computer Architecture	3(3-0)	CS 4920	Summer Internship	0(0-40)
CS 2231	Computer Architecture Laboratory	1(0-3)	CS 4921	Computer Science Project I	1(0-3)
CS 2205	Operating Systems	3(3-0)	CS 4922	Computer Science Project II	3(0-9)
			SE 3901	Software Engineering	3(3-0)

2.2 Specialized Courses**24 credits****2.2.1 Option 1 (Computer Science):**

Students in this option may select any combination of the following specialized courses and/or specialized courses in other options with an approval of each student's advisor to fulfill the requirement of 24 credits.

CS 2106	Theory of Computation	3(3-0)	CS 3103	Security and Cryptography	3(3-0)
CS 2401	Theory of Programming Languages	3(3-0)	CS 3803	Special Topics in Computer Science I	3(3-0)
CS 2402	Programming Language Translation	3(3-0)	CS 3804	Special Topics in Computer Science II	3(3-0)
CS 2600	Artificial Intelligence	3(3-0)	CS 3704	Data Mining and Warehousing	3(3-0)

2.2.2 Option 2 (Software Engineering):

CS 2707	Electronic Commerce and Trading Information Systems	3(3-0)	SE 3904	Software Requirements Specification and Management	3(3-0)
CS 3708	Decision Support Systems	3(3-0)	SE 3905	Software Process and Quality Assurance	3(3-0)
SE 3902	Software Project Management	3(3-0)	SE 3906	Software Architecture	3(3-0)
SE 3903	Software Validation and Verification	3(3-0)	SE 3907	Object-Oriented System Analysis and Design	3(3-0)

2.2.3 Option 3 (Communication and Information Systems):

CS 2707	Electronic Commerce and Trading Information Systems	3(3-0)	TE 3106	Communication Systems	3(2-3)
CS 3700	Introduction to Bioinformatics	3(3-0)	TE 3205	Digital Signal Processing	3(3-0)
TE 2004	Signals and Systems	3(3-0)	TE 3208	Embedded Platforms	3(2-3)
TE 2207	Electronic Circuits and Measurements	3(2-3)	TE 3209	Data Acquisition Systems and Instrumentation	3(2-3)

2.2.4 Option 4 (Computer Applications for Businesses and Industries):

MG 1004	Principles of Accounting I	3(3-1)	CS 3700	Introduction to Bioinformatics	3(3-0)
MG 2002	Business Finance	3(3-1)	CS 3708	Decision Support Systems	3(3-0)
CS 2707	Electronic Commerce and Trading Information Systems	3(3-0)	SE 3704	Data Mining and Warehousing	3(3-0)
CS 3500	Multimedia Systems	3(2-3)	CS 2506	Computer Animation Production	3(2-3)
			or		
			CS 3501	Game Design and Development	3(2-3)

2.3 Specialized Electives**6 credits**

Students can freely select any CS, SE, TE courses offered by Computer Science program with an approval of each student's advisor to satisfy 6 credits of specialized elective requirement.

3. Free Electives**6 credits**

Students can freely select any graded courses offered by any academic unit of the university to satisfy 6 credits of free elective requirement.

Bachelor of Science Program in Management Technology

Curricular Title

Bachelor of Science Program in Management Technology

วิทยาศาสตร์บัณฑิต สาขาวิชาเทคโนโลยีการจัดการ

Degree Title

Full Title:

Bachelor of Science
(Management Technology)

วิทยาศาสตร์บัณฑิต (เทคโนโลยีการจัดการ)

Abbreviation:

BSc (Management Technology)

วท.บ. (เทคโนโลยีการจัดการ)

Curriculum Structure and Components

The students must complete a minimum requirement of 146 credits to graduate. The curriculum is divided into general education courses, management technology core courses and four areas of specialized options, i.e.,

- Option 1: Architectural Technology Management
- Option 2: Engineering Management
- Option 3: Food and Biotechnology Management
- Option 4: Management Information Systems

Curricular Philosophy and Goals

Management Technology is an integrated understanding of economics, environment, information system, science and engineering. The Management Technology program is designed to produce high-quality graduates equipped with such an interdisciplinary subject and capable of managing advanced technologies emerging dynamically in various industrial and commercial fields. The graduates will have abilities to analyse and design systems which integrate technical, economical, environmental and social aspects for all kinds of transactions and activities.

Highly demanded areas of specialization such as Architectural Technology Management, Engineering Management, and Management Information Systems are offered for selection as a specialized option. The study program will lead to variety of professional opportunities in manufacturing industry, building and construction industry, all private and public service industries, property and estate development businesses, as well as financial sectors dealing with investments of projects requiring modern technologies.

1. General Education Courses	47	credits
1.1 Humanities and Social Science	20	credits
1.2 English Language	6	credits
1.3 Basics in Science and Mathematics	21	credits
2. Management Technology Core Courses	93	credits
2.1 Common Courses	48	credits
2.2 Specialized Options	39	credits
2.3 Specialized Electives	6	credits
3. Free Electives	6	credits
Total	146	credits

1. General Education Courses	47	credits
1.1 Humanities and Social Sciences	20	credits

GE 1101	Principles of Economics	3(3-1)	GE 1112	Humanities, an Integrated Approach	3(3-0)
GE 1102	Law and Society	3(3-1)	GE 1113	Social Sciences, an Integrated Approach	3(3-0)
GE 1103	Management in Action	3(2-3)	GE 1114	Thai Studies	3(3-0)
GE 1108	Sports	1(0-3)		or	
GE 1109	Music Appreciation	1(1-1)	GE 1116	Greater Mekong Sub-region Studies	3(3-0)

1.2 English Language**6 credits**

GE 1003	Freshman Composition I	3(3-0)	GE 1004	Freshman Composition II	3(3-0)
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1.3 Basics in Science and Mathematics**21 credits**

GE 1205	Physical Science	3(3-1)	GE 1304	Calculus I	3(3-1)
GE 1206	Biological Science	3(3-1)		or	
GE 1207	Integrated Approach to Science and Technology	3(3-1)	GE 1310	Basic Calculus *	3(3-1)
GE 1208	Environmental Studies	3(3-1)	GE 1305	Calculus II	3(3-1)
				or	
			MG 1007	Management Calculus *	3(3-1)
			GE 1306	Introduction to Statistics	3(3-1)

Remarks: * For Architectural Technology Management and Food and Biotechnology Management options only

2. Management Technology Core Courses**93 credits****2.1 Common Courses****48 credits**

BE 1001	Fine Arts and Science Integration	3(2-3)	MT 3005	Thermo Fluids	3(3-0)
BE 4703	Computer Graphics and Multimedia	3(3-0)	MT 3501	Social Aspects of Environment Management	3(3-0)
BE 4901	Introduction to Environmental Urban Planning	3(3-0)	MT 4004	Management Technology Training	0(0-40)
BE 4912	Environmental Impact Assessment	3(3-0)	MT 4005	Senior Project	3(0-9)
MT 2001	Basic Electrical Engineering	3(3-0)	GE 3002	Technical Writing	3(3-0)
MT 2002	Materials Science	3(3-0)	CS 1009	Computer Programming	3(2-3)
MT 3004	Engineering Economy	3(3-0)	MG 1004	Principles of Accounting I	3(3-1)
			MG 2001	Principles of Marketing	3(3-1)
			MG 2002	Business Finances	3(3-1)
			MG 3001	Strategic Management	3(3-1)

2.2 Specialized Options**39 credits****2.2.1 Option 1: Architectural Technology Management**

BE 2001	Architectural Theory and Philosophy I	3(3-0)	BE 3104	Architectural and Environmental Design IV	3(1-6)
BE 2101	Architectural and Environmental Design I	3(1-6)	BE 3602	Building Systems and Integration II	3(3-0)
BE 2102	Architectural and Environmental Design II	3(1-6)	BE 4105	Integrated Architectural and Environmental Design I	3(1-6)
BE 2301	Structures I	3(3-0)	BE 4201	Energy and Environmental Technology I	3(2-3)
BE 2303	Building Materials and Construction I	3(2-3)	BE 4202	Energy and Environmental Technology II	3(2-3)
BE 2601	Building Systems and Integration I	3(3-0)	BE 4701	Building Energy and Cost Estimation	3(3-0)
BE 3103	Architectural and Environmental Design III	3(1-6)			

2.2.2 Option 2: Engineering Management

MT 3304	Operations Research	3(3-0)	MG 2101	SME Management	3(3-1)
MT 3307	Logistics and Supply Chain Management	3(3-0)	MG 2301	Quantitative Analysis Techniques for Business	3(3-1)
MT 3502	Pollution Prevention	3(3-0)	MG 3301	Project Management	3(3-1)
MT 4003	Project Feasibility Study	3(3-0)	MG 3501	Management Information Systems	3(3-1)
MG 2004	Human Resource Management	3(3-1)	CS 3004	Computer Models for Business Decisions	3(2-3)
MG 2005	Business Information Technology	3(3-1)	CS 3801	Information Technology Laws, Regulations, and Ethics	3(3-0)
MG 2006	Production and Operations Management	3(3-1)			

2.2.3 Option 3: Food and Biotechnology Management

MT 1601	Introduction to Biotechnology	3(3-0)	MT 2604	Food Preservation: Principles and Applications	3(3-0)
MT 1602	General Food Science	3(3-0)	MT 2605	Sensory Evaluation of Foods	3(3-0)
MT 1603	Biochemistry	3(3-0)	MT 2606	Food Safety and Quality Management	3(3-0)
MT 1604	Human Nutrition	3(3-0)	MT 3502	Pollution Prevention	3(3-0)
MT 3601	Food Analysis	3(3-0)	CS 2702	Business Information Systems	3(3-0)
MT 2602	Health Food and Herbal Medicine	3(3-0)	CS 3700	Introduction to Bioinformatics	3(3-0)
MT 2603	Food Choice: Psychology, Preference and Acceptability	3(3-0)			

2.2.4 Option 4: Management Information Systems

CS 1002	Object-Oriented Programming Paradigms	3(2-3)	CS 3801	Information Technology Laws, Regulations, and Ethics	3(3-0)
CS 1003	Data Structures and Algorithms	3(3-0)	SE 3704	Data Mining and Warehousing	3(3-0)
CS 1300	Internet and the World Wide Web Technologies	3(2-3)	SE 3907	Object-Oriented System Analysis and Design	3(3-0)
CS 2700	Databases	3(3-0)	MT 3502	Pollution Prevention	3(3-0)
CS 2707	Electronic Commerce and Trading Information Systems	3(3-0)	CS 2702	Business Information Systems	3(3-0)
CS 3708	Decision Support Systems	3(3-0)	CS 2901	Software Development	3(3-0)
SE 3901	Software Engineering	3(3-0)	CS 3709	Knowledge Management	3(3-0)

2.3 Specialized Electives**6 credits**

Students can freely select any relevant courses with the approval of each student's advisor.

3. Free Electives**6 credits**

Students can freely select any graded courses offered by any academic unit of the university to satisfy 6 credits of free elective requirement.

School of Management

Direct-Hired Faculty

Chuvej Chansa-ngavej, Associate Professor

Dean – School of Management
Program Chairperson – Business Administration Program

BE, (1st Class Hons), Industrial Engineering
 (University of New South Wales)
 ME, Operations and Marketing Management
 (University of New South Wales)
 PhD, Capital Budgeting (Ohio State University)

Pacapol Anurit, Assistant Professor

Program Director – Master of Business Administration Program

BA, International Business (Richmond University)
 MA, Computer Resources and Information Management (Webster University)
 MBA, General Management (Webster University)
 PhD, Consumer Behavior (Middlesex University Business School)

Amporn Soongswang, Lecturer

BA, Economics (Thammasat University)
 MBA, Financial Management (National Institute of Development Administration)
 MFM, Financial Management (Australian National University)
 PhD, Finance (Edith Cowan University)

Chanchai Bunchapattanasakda, Assistant Professor

BBA, Advertising and Public Relations (Ramkhamhaeng University)
 MBA, Marketing (Argosy University)
 DBA, International Business (Argosy University)

John Walsh, Assistant Professor

BA (Honors), English Language and Literature (University of Hull)
 DPhil, International Marketing (Oxford University)

Nattharika Rittippant, Lecturer

BA, Economics (University of Dallas)
 BS, Biology (University of Dallas)
 MBA, International Management (University of Dallas)
 MM, E-Commerce (University of Dallas)
 PhD, Strategic Management (University of Texas at Arlington)

Nittana Southiseng, Instructor

BA, English (National University of Laos), Laos
 MBA, International Business (The National Organization of the Studies of Policy and Administration), Laos
 MBA, International Public Management (Asian Institute of Technology)

Opas Piansoongnern, Instructor

BA, (1st Class Hons), Journalism (Pibulsongkram Rajabhat University)
 MA, Social Development (National Institute of Development Administration)
 MBA, Management (Shinawatra University)

Somchai Ratanakomut, Associate Professor

BEcon, (Hons) Economic Theory (Thammasat University)
 MEcon, International Trade (Thammasat University)
 PhD, Economics (University of Utah)

Supachok Wiriyacosol, Associate Professor

Program Director – Master of Science in Management Program
Acting Director – Research Management Center (Graduate Campus)

BE, Mechanical Engineering (The University of Western Australia)
 MES, Industrial Engineering (The University of Melbourne)
 PhD, Industrial Engineering (The University of Melbourne)

Ty Makararavy, Instructor

BA, Teaching and Tourism (Institute of Foreign Language), Cambodia

Adjunct Faculty

Athakorn Kengpol, Assistant Professor

PhD, Manufacturing Engineering and Management (University of Nottingham, UK)

Chompoonuh Kosalakorn Permpoonwiwat, Assistant Professor

PhD, Economics (University of Utah)

Pirun Hemmondharop

PhD, Engineering Management (University of Missouri, Rolla)

Renu Sukharomana, Associate Professor

PhD, Agricultural Economics (University of Nebraska, Lincoln)

Vassana Maprasert, Assistant Professor

DBA, Marketing (NIDA)

School of Technology

Direct-Hired Faculty

Prinya Tantaswadi, Assistant Professor

Acting Dean – School of Technology

BEng, Electrical Engineering
(Chulalongkorn University)

MSc, Electrical Engineering (University of Texas at
Arlington)

PhD, Electrical Engineering (Texas A&M University)

Damrong Khummongkol, Professor

Deputy Dean – School of Technology

BE, (1st Class Hons) Chemical Engineering
(Monash University)

PhD, Chemical Engineering (Monash University)

Apichat Praditsmanont, Assistant Professor

Program Chairperson – Architectural Technology

BArch (Hons), Architecture (Chulalongkorn University)

MArch, Computation and Simulation (University of
Texas at Austin)

PhD, Architecture (University of Texas at Austin)

Chakguy Prakasvudhisarn, Assistant Professor

*Program Director – Master of Science in Information
Technology*

BEng, Computer Engineering
(Chulalongkorn University)

MS, Computer Science (University of Oklahoma)

PhD, Industrial Engineering
(University of Oklahoma)

Chutiporn Anutariya, Assistant Professor

Program Chairperson – Computer Science

BSc, (1st Class Hons), Statistics
(Chulalongkorn University)

MSc, Computer Science
(Asian Institute of Technology)

DTechSc, Computer Science
(Asian Institute of Technology)

Pruitipong Thaicham, Lecturer

*Acting Program Chairperson – Management
Technology*

BEng, Civil Engineering (SIIT, Thammasat University)

PhD & MSc, Renewable Energy
(University of Nottingham)

Byaporn na Nagara, Assistant Professor

Vice President – Main Campus

MS, Chemistry (Fort Hays State University &
Drexel University)

MSc, Pathobiology (Mahidol University)

PhD, Physical Chemistry
(University of Missouri-Rolla)

Chuthathip Maneepong, Assistant Professor

BA, Humanities and Sociology
(Chulalongkorn University)

MURP, Urban and Regional Planning
(University of Sydney)

PhD, Planning and Urban Development
(University of New South Wales)

Karel Leopold Sterckx, Lecturer

BEng, (Hons), Electrical and Electronic Engineering
(Katholieke Industriële Hogeschool der
Kempen)

MSc, Optoelectronics and Communications Systems
(University of Northumbria at Newcastle)

PhD, Awarded for work on Optical Wireless
Communications (University of Wales Swansea)

Krissada Maleewong, Instructor

BSc, (2nd Hons), Agricultural Technology
(Thammasat University)

MSc, Information Technology, Shinawatra University

Lin Min Min Myint, Instructor

BEng, Electronics (Assumption University)

ME, Telecommunications
(Asian Institute of Technology)

Martin Schoch, Instructor

Diploma, Architecture (University for Applied Sciences)

MArch, Architecture (Pratt Institute)

MD Maruf Hasan, Lecturer

BEng, Computer Engineering (Tsinghua University)

MSc, Computer Science (National University of
Singapore)

DEng, Information Science (Nara Institute of Science
and Technology)

Narong Wesnarat, Lecturer

BSc, Industrial Education (King Mongkut's Institute
of Technology)

MSc, Communication Engineering (University of the
Philippines at Diliman)

Paul Andrew James Mason, Assistant Professor

BSc, (Hons), Business Information Technology
(University of Northumbria at Newcastle)

MSc, Computing Science (University of Newcastle)

PhD, Computing Science & Systems Engineering
(University of Newcastle)

Photchanan Ratanajaipan, Lecturer

BSc, Computer Science (Thammasat University)

MSc, Computer Science
(Asian Institute of Technology)

Prida Wibulswas, Professor

President of SIU

BSc, Eng (Hons), DIC (Thermal Proc)
(Imperial College London)

PhD, (University College London)

Rachanee Ungrangsi, Instructor

BEng, Computer Engineering (Prince of Songkla University)
MSc, Computer Engineering (Boston University)

Than Khin, Lecturer

BEng, Chemical Engineering (Yangon Institute of Technology)
DEng & MEng, Environmental Engineering (Asian Institute of Technology)

Vutthi Bhanthumnavin, Professor

*Acting Provost,
Program Director – PhD Program*
AB, Physics (Hons), (University of California, Berkeley)
MS, Nuclear Physics (University of Illinois, Urbana-Champaign)
PhD, Laser Physics (University of Maryland, College Park)

Adjunct Faculty**Asis Unyapoth**

PhD, Computer Laboratory (Cambridge University)

Boriboon Novaprateep

PhD, Computational and Applied Mathematics (Old Dominion University)

Brian Anthony Curtin

PhD, Fine Art (University of Bristol)

Chantana Chantrapornchai, Associate Professor

PhD, Computer Science and Engineering (University of Norte Dame)

Chuwong Phongcharoenpanich, Assistant Professor

DEng, Electrical Engineering (KMULT)

Eakapong Tungsrigan

DEng, Telecommunication (Asian Institute of Technology)

Krithpaka Boonfueng

PhD, Juridical Science (American University)

Pornchai Supnithi, Assistant Professor

DEng, Electrical and Computer Engineering (Georgia Institute of Technology)

Thanarat H. Chalidabhongse, Assistant Professor

PhD, Computer Science (Maryland University)

Liberal Arts and Language Center**Direct-Hired Faculty****Kanittha Navarat, Associate Professor**

Acting Director – Liberal Arts and Language Center
BA, (1st Class Hons) German (Chulalongkorn University)
MA, Teaching English (University of Illinois, Urbana)
PhD, Higher Education (Chulalongkorn University)

Elizabeth Jane Reynolds

BA, Psychology and Comparative African Govt. (University of Natal)
BL, Laws (University of Natal)
ML, Criminology and Criminal Justice (London School of Economics)

Robert Kirkpatrick, Assistant Professor

NSCS, Chemistry (Auckland University of Technology)
MA, Applied Linguistics (University of Waikato, New Zealand)
PhD, Science and Mathematics Education (Curtin University of Technology, Australia)

General Education**Adjunct Faculty****Chutatip Umavijani, Assistant Professor**

MA, International Relations Study (CGU-Claremont), California

Ek-karach Charoennit, Assistant Professor

MA, Music (Santo Tomas), Philippines

Kullaya Dejithirat

PhD, Education Psychology (The University of Texas at Austin)

Nuntana Kapilakanchan, Associate Professor

MA, History and Social Science (New Mexico Highlands University)

Pareena Srivanit

SJD, Juridical Science (University of Wisconsin-Madison)

Pradhak Pradipasen

EdD, Music (Columbia University), New York
Associate of the Royal Academy of Music, London

Vice President & Directors

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Vice President – Main Campus
Acting Comptroller
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Director – Buildings and Facilities
Telephone Ext. 1542

Assoc. Prof. Dr. Kanittha Navarat
Acting Director – Liberal Arts and Language Center
Telephone Ext. 1240

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Registrar
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Ms. Wanlaya Puangmalee
Acting Senior Finance Manager
Telephone Ext. 1193

Managers

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Human Resources Manager
Telephone Ext. 1163

Mr. Narong Wesnarat
Computer System Manager
Telephone Ext. 2310

Mrs. Numrin Klowkling
Accounting Manager
Telephone Ext. 1198

Mr. Ponlawee Kaewrux
Building and Grounds Manager
Telephone Ext. 1131

Mrs. Prachumporn Niratsayakul
General Affairs Manager
Telephone Ext. 1132

Mrs. Suphattra Sattra
Dormitory Manager
Telephone Ext. 6108

Mrs. Tipayarut Hansuebsai
Student Affairs Manager
Telephone Ext. 1180

Mr. Tumrongrat Sittichai
Academic Support Manager
Telephone Ext. 1301

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Secretary – Business Administration
in Management
Telephone Ext. 1254

Ms. Usanee Deethongkum
Secretary – Computer Science
Telephone Ext. 1251

Ms. Wiranya Hawut
Secretary – Management Technology
Telephone Ext. 1255

Administrative Secretaries

Ms. Kanittha Sakontraweenat
Secretary – Office of President
Telephone Ext. 1246

Mr. Sucheep Srimongkol
Executive Secretary – Office of Provost
Telephone Ext. 1273

Ms. Panitee Pukdeevanit
Secretary – Office of Vice President – Main Campus
Telephone Ext. 1231

Ms. Paveena Malayaporn
Secretary – Office of Library and Information Service
Telephone Ext. 1556

Ms. Sukanya Praditpong
Secretary – Office of Academic Affairs
Telephone Ext. 1289

Course Descriptions

English Courses

GE 1001 Foundation English I 3(3-0)

A course in basic English language skills, with an emphasis on communication skills essential in an academic setting. Basic elements of academic genres emphasizing improved fluency and accuracy, with additional support from sound lab programs. Does not count toward graduation requirements.

GE 1002 Foundation English II 3(3-0)

Recommended prerequisite:

GE 1001 Foundation English I

Strategies for academic work: reading with increased comprehension and speed; focusing on writing; developing basic skills in listening and speaking; using the library, with additional support from sound lab programs. Does not count toward graduation requirements.

GE 1003 Freshman Composition I 3(3-0)

A course developing skills in critical reading and argumentation, logical thinking, and use of library resources. Emphasis on writing in the conventions of specific fields, style and organization, and conversational and presentation skills useful in an academic setting, with additional support from sound lab programs.

GE 1004 Freshman Composition II 3(3-0)

Recommended prerequisite:

GE 1003 Freshman Composition I

The course is designed for focusing on helping students develop critical reading skills: being able to identify a writer's line of argument, to evaluate the claims a writer makes in light of the evidence given to support those claims, and to evaluate the implications of an argument. Also emphasis on developing skills for conducting research. Group discussion and group working, further conversational and presentation skills, with additional support from sound lab and library resources.

GE 1117 Basic German 3(3-0)

This course is designed for beginners of German to introduce them to the everyday use of German covering topics such as greetings, introducing oneself, asking for help, numbers etc. with an emphasis on the speaking and listening skills. Basic German grammar will be taught as well.

GE 3002 Technical Writing 3(3-0)

Recommended prerequisite:

GE 1004 Freshman Composition II

Students learn and practice writing and presentation of technical reports, which include reports of laboratory experiments, in-depth technical reports, overview articles of technical topics for the general public, as well as executive summaries.

GE 3003 English for Graduation 3(3-0)

Undergraduates need a TOEFL score [or equivalent] of at least 500 (IELTS level 5.0) to graduate from SIU. The course aims to help students prepare for the exam. The course will cover all the elements of the CUTEP exam: listening comprehension, error identification, cloze, reading comprehension, and essay writing.

GE 3004 Business English I 3(3-0)

Recommended prerequisites:

GE 1003 Freshman Composition I

and GE 1004 Freshman Composition II

A course to prepare students to work in an international business environment. The language syllabus is developed in the context of everyday functions with opportunities to practice all four language skills. Emphasis is on listening and speaking with role plays and conversation-based activities designed to help students related to the modern business world.

GE 3005 Business English II 3(3-0)

Recommended prerequisites: **GE 1003** Freshman Composition I, **GE 1004** Freshman Composition II, **and GE 3004** Business English I

A continuous course of Business English I with focus on real business situations, both formally inside the workplace and informally on social occasions in a cross-cultural environment. Students will be exposed to various types of business correspondence, reports, and proposals, and do mini-presentations.

General Studies

GE 1006 Psychology for Self 3(3-0)

Development

Growth and bodily structured adolescents, pleasant and unpleasant behaviors are addressed and discussed: anger and management, aggression, communication, and drugs and effects of drugs. The application of psychology in a team working will be practiced.

GE 1101 Principles of Economics 3(3-1)
Economic problems of individuals, firms and industries with emphasis on value, price, and distribution of income. Macroeconomic measurement and models of aggregate demand and supply; principles and theory of international trade, fiscal and monetary policy, principles and theories of national income determination, analysis of investment and consumption in the national and international economy and relation to employment, inflation, stabilization, utilization and conservation of land and natural resources applied in the examination of pollution control, preservation vs. development, deforestation, and other environmental issues.

GE 1102 Law and Society 3(3-1)
This is an introductory course that shows the nature and role of law in society. Thus, students will learn the structure of the court system in Thailand and in other legal systems. Importantly too, the course looks at the relationship between new technology (such as the Internet, E-commerce, computers) and law. Students will learn how to use the Internet to conduct legal research and study and will do a presentation using such new technology. Also, the course looks at international organizations (such as the United Nations, the World Trade Organization, and WIPO) and their relationship to Thai law and society. The course will use the case study method to explore important current issues in various legal areas including computer law, criminal law, civil law, family law, business law, and public governance.

GE 1103 Management in Action 3(2-3)
Emphasis on first year students from different disciplines working together to solve community problems; project management strategies, team working, data and evidence collection leading to acceptable and feasible solutions to the problems. This will be under the supervision and guidance of technical solutions, technical drawing, marketing analysis of technological products. Implementation of management and Information Technology in solving problems in management is emphasized. Systematic and objective search for and analysis of information relevant to the identification and solution of problems in community and integration of various information systems are introduced as tools in enhancing the effectiveness of problem solving strategies and management.

GE 1106 Aesthetics 3(3-0)
Aesthetics (art appreciation) is designed to expose, broaden, and challenge students' understandings of visual art, in a global context. Students are provided with an overview of approaches and methods which emphasize the variety of ways that art objects and visual culture can be contextualized and analyzed. Students will complete the course with a sound knowledge of methods and theories relevant to a holistic appreciation of visual art.

GE 1107 Philosophy and Ethics 3(3-1)
Examination and analysis of principal ideas of great philosophers in democratic and business world related to principal religious ideas, in light of science and modern technology, psychology, philosophy, and anthropology. Topics include relationships between learning and life, science and technology and life, ethical dimensions of managing businesses in globalization.

GE 1108 Sports 1(0-3)
Students may select one sports of their choice opened for enrollment to participate and practice.

GE 1109 Music Appreciation 1(1-1)
The course is designed to provide basic knowledge of the art of music. It will cover major elements of music and an overview of the aesthetic and philosophical principles of music.

GE 1111 Introductory Social Psychology 3(2-3)
The individual in a social context, including motivation, attitudes, conformity, communication, and leadership. Analysis of attitudes, social factors in the formation and change of attitudes in public opinion, consumer behavior, norms and standards, and other social psychological factors on the morale and productivity of individuals and the industrial work group.

GE 1112 Humanities, an Integrated Approach 3(3-0)
This course focuses on the relevance of humanities to life, our present day problems and ways to solve them, man's existence, beliefs and self knowledge. Emphasis is also placed the influence of western civilization on eastern civilization. Preparations and responsibilities of man in the 21st century concerning education, technology, nuclear war, overpopulation, ecology, gap between developed and underdeveloped countries will be discussed and analyzed.

GE 1113 Social Sciences, an Integrated Approach 3(3-0)
Fundamentals of social science principles in sociology, economics, political science and international relations will be covered. Emphasis will be on the scientific paradigm for the explanation of social phenomenon. The course will also focus on the analysis of the global society from the multidisciplinary perspectives, particularly from the sociology, political science and economics disciplines. Current political, security, economic and social issues will be analyzed by the application of social theories with the global, regional and national perspectives.

GE 1114 Thai Studies 3(3-0)
Evolution of Thai Society: settlement, government, economy, social values, and way of life. Factors that determine Thai society and culture, artistic and technological creativity, geography and natural resources, trends in social and cultural development.

GE 1116 Greater Mekong Sub-region Studies 3(3-0)

The history, geography and human geography, political, religious and artistic expression of the Greater Mekong Subregion (GMS) (Thailand, Burma, Cambodia, Laos, Vietnam and Yunnan Province of China) are explored and placed in comparative perspective. This course features classroom teaching together with critical evaluation of texts and seminar activities. Students will come to have an appreciation of the Greater Mekong Subregion as a whole and of the people who help constitute it.

GE 1204 Environment, Evolution, and Society 3(2-3)

Fundamental biological principles in genetics and evolution, reproduction and development will be covered. Emphasis will be on human genetics, genetic abnormalities, intelligence, genetic engineering, DNA controversy on society, ecological and environmental issues as they impact the future evolution of life on earth including our ecosystem. The influence of cultural and political factors on environmental issues and solutions will be promulgated and discussed.

GE 1205 Physical Science 3(3-1)

Introduction to physical world. SI units, Measurement. Fundamental quantities, mass, length time. Newton's Laws of Motion; kinematics, dynamics. Energy; heat. Sound wave. Light. Electricity and magnetism. Atom, energy levels, quantum numbers, electronic configurations. Chemical reactions, chemical bonds, electroegativity. Radioactivity, decay, half life. Nuclear reactions.; Introductory Nanotechnology. Life Cycle of Stars.

GE 1206 Biological Science 3(3-1)

Energy and life's organization, chemistry of life, structure and function of biological molecules and cellular organelles. Metabolic diversity of microorganisms. Viruses and infectious particles. Mendel's laws, Evolution and natural selection.

GE 1207 Integrated Approach to Science and Technology 3(3-1)

The course focuses on concept, history and development of science, biological sciences, health sciences, physical sciences, engineering sciences and technologies. It is also exploring of emerging front line technologies as well as covering integration of built environment to natural environment. Ecology impacts from the development of industries, agriculture, energy and materials.

GE 1208 Environmental Studies 3(3-1)

The ecology of natural system, ecosystem, and growth. Food production and land use. Extinction and genetic resources. Sources of energy, energy utilization and related environmental issues. Control of pest and weeds. Water resources and water pollution. Air pollution. Solid waste. The environment and human health.

GE 1211 General Chemistry 3(3-0)

A survey of organic and inorganic chemistry. Stoichiometry and the mole concept, the behavior of gases, liquids and solids, thermochemisbonding, descriptive chemistry of selected elements and compounds, chemical equilibrium. Emphasis is on relevance to biological and social issues.

GE 1302 Mathematics 3(3-1)

This course introduces the elementary functions: linear, quadratic, polynomial, rational, exponential, logarithmic and trigonometric and their properties. Also matrix algebra is covered. Topics include matrix operations and the use of matrices to solve systems of linear equations and pre-calculus topics.

GE 1304 Calculus I 3(3-1)

Emphasis on functions, limits, derivatives, curve sketching, Mean Value Theorem, trigonometric functions, related rates, linear and quadratic approximations, maximum-minimum problems, inverse functions, definite and indefinite integrals, logarithmic, exponential, and hyperbolic functions; applications of integration, integration by substitution and by parts.

GE 1305 Calculus II 3(3-1)

Recommended prerequisite: GE 1304 Calculus I
Topics in Integration by trigonometric substitution and partial fractions; arclength; indeterminate forms, improper integrals; Simpson's and Trapezoidal Rules for numerical integration; Newton's method, Taylor's Theorem including a discussion of the remainder, sequences, series, power series; separable differential equations, first order linear differential equations, homogeneous second order linear differential equations with constant coefficients.

GE 1306 Introduction to Statistics 3(3-1)

The scope and uses of statistics in research methodology: descriptive statistics, elementary probability, basic problems of statistical inference: measurement to the central tendency, random variables, probability distribution, estimation, confidence intervals, hypothesis testing, analysis of variance, regression and correlation.

GE 1307 Project Methods 3(2-3)

Fundamentals of project methods are emphasized: acquiring and accessing to information resources, collecting information, storing and selecting information for references and learning how to cite references. Faculty and graduate students will lead participation in research or creative endeavor. This course includes participation in project discussion groups, critique of readings, and preparation of written reports and presentations.

GE 1310 Basic Calculus 3(3-1)
This course is not offered to students who are required to take GE 1304. The course is designed to provide a mathematical foundation for students including the applications in the business world. Students are firstly given a brief review on non-calculus topics such as equations, functions, and matrix algebra. Then, fundamental calculus topics including limits, differentiation, and curve sketching are introduced.

School of Management

Business Administration Program

MG 1001 Introduction to Business 3(3-1)
The aim of this course is to study the fundamental philosophy, objectives, and responsibility of the business enterprises; aiming at the business and its environment. The course also focuses on the principles of organization, legal forms of business ownership, and business activities concerning marketing, production and operations, personnel, accounting, and finance.

MG 1004 Principles of Accounting I 3(3-1)
This course provides the basic concepts of the accounting principles, procedures, and systems; financial statements and business transactions; analyzing and recording transactions; accrual accounting and financial statements; and completing the accounting cycle. The course also covers accounting for merchandising activities; merchandising inventories and cost of sales; and the accounting information systems.

MG 1005 Principles of Accounting II 3(3-1)
Recommended prerequisite:
MG 1004 Principles of Accounting I
This course focuses on the study of accounting information for planning, operating, decision-making, and control; the financial statement analysis; reporting and analyzing the cash flows statement. Course topics also cover the cost-volume-profit analysis, and the performance and profit measurement.

MG 1006 Business Statistics 3(3-1)
This course is offered to students majoring in business administration only. The course is intended to cover fundamental topics in probability and statistics including their applications to today's businesses. Students will learn about classification and presentation of data, measures of central tendency, measures of dispersion, probability distributions, sampling and sampling distributions, estimation and confidence intervals, one-sample and two-sample tests of hypothesis, chi-square and goodness-of-fit tests, analysis of variance, and linear and multiple regression. The use of software tools in analyzing statistical data will be emphasized throughout the course.

MG 1007 Management Calculus 3(3-1)
Recommended prerequisite: GE 1310 Basic Calculus
Similar to GE 1310, this course is not offered to students who are required to take GE 1304 and GE 1305. A continuation from GE 1310, the course gives further discussion on differential topics and their applications. Students will also learn about fundamental concepts of integration, including integration by parts, approximate integration, differential equations, etc.

MG 2001 Principles of Marketing 3(3-1)
This course introduces students to the principles and practices of marketing management. Course topics include understanding consumer behavior, identifying local and global markets, creating and managing products and services, pricing methods, distribution channels, and integrated marketing communication methods. A special emphasis is placed on the use of the Internet and e-commerce in marketing.

MG 2002 Business Finance 3(3-1)
This course studies financial decision-making in business, including analysis of financial statements, assessment of risk, portfolio theory, valuation of equity and debt instruments, capital structure, capital budgeting, financial management, dividend payouts, and international finance. The course is a corporate finance essential which includes investment decision, financing decision, and dividend decision.

MG 2003 Managerial Economics 3(3-1)
Recommended prerequisite:
GE 1101 Principles of Economics
This course emphasizes on the analysis and application of economic factors affecting decisions made by firms. The contents include demand and supply analysis, market structure, resource allocation, production analysis, cost theory and estimation, profit maximization, pricing decision in practices, and decision-making under risk and uncertainty.

MG 2004 Human Resource Management 3(3-1)
This course examines human resource management functions in organizations. Major topics include human resource planning, legal requirements and major functions including analyzing jobs and recruiting, selection and placement, training and development, performance appraisal and career development, compensation and benefits, employee-management relations, and attitudes and behavior within organizations and increasing effectiveness through technology systems.

MG 2005 Business Information Technology 3(3-1)

This course introduces information technology in business applications. The contents cover the following computer hardware and software: central processing unit, input/output media and devices, storage and multimedia, operating system, programming concepts and computer languages, database and network technology, ethics and security. Also, the practices with application software packages for office and the Internet are included.

MG 2006 Production and Operations Management 3(3-1)**Recommended prerequisite:****MG 2301 Quantitative Analysis Techniques for Business**

This course studies problems encountered in production and operations from managerial perspective. It examines the principles and the analysis of decision-making for optimizing the production and service operations. Emphasis is placed on the design of manufacturing and service systems, product design and development, design of service delivery process, location selection, facility layout, material requirement planning, enterprise resource planning, quality control, inventory control, and scheduling.

MG 2101 SME Management 3(3-1)

This course concerns small and medium business involvement and management. It is organized around the following themes; understanding the SMEs (systems theory, culture, and stages of evolution); individual development and career planning; management of SME structure, conflicts, and relationships; and organizational issues, including succession and estate planning, strategic planning, and formalizing the firm.

MG 2102 Business Communication and Negotiation 3(3-1)

This course provides an overview of major forms of business communication such as business conversation and negotiation, business correspondence, oral and written presentation, and techniques associated with these forms. The negotiation portion of this course explores the major concepts and theories of the psychology of bargaining and negotiation.

MG 2103 Entrepreneurship 3(3-1)**Recommended prerequisite:****MG 2101 SME Management**

This course concentrates on how new businesses are started, with the objectives of understanding entrepreneurs, seeking and evaluating opportunities for new ventures, and gathering resources to convert those opportunities into businesses.

MG 2104 International Business 3(3-1)

This course focuses on the general international business environment and the global business practices of multinational corporations. Course contents include barriers against free trade and foreign investment, assessment and management of economic and political risk in international business, foreign exchange markets and derivatives, entry mode and controlling systems, international operation and marketing management, and international human resource management. Examination of cross-cultural differences and their impact on business practices are also emphasized.

MG 2201 Macroeconomics 3(3-1)**Recommended prerequisite:****GE 1101 Principles of Economics**

This course studies an economic system at the national and international levels. It presents the methods to measure important economic indicators and examines their movements in response to business cycles. Topics also cover the determinants and their effects on labor market, goods market, and asset market. With understanding of the connection among these markets, analytical tools are used to investigate the effects of economic shocks on the economy as a whole.

MG 2202 Monetary Theory and Policy 3(3-1)**Recommended prerequisite:****GE 1101 Principles of Economics**

This course is designed to guide students to develop critical thinking concerning financial markets and institutions. Topics to be discussed consist of financial instruments, interest rate determination, risk and term structure, the liberalization of financial markets, and international finance. The course also introduces the role of government monetary policy influencing the level of economic activity or the operation of the economy as a whole.

MG 2301 Quantitative Analysis Techniques for Business 3(3-1)**Recommended prerequisite:****MG 1007 Management Calculus**

This course discusses the applications of quantitative analysis techniques in business problem-solving. Topics covered in the course include vectors and matrices, linear programming, transportation problems, assignment problems, inventory control problems, graph and network, Markov analysis, and simulation. This course utilizes computer programs to find solutions for business problems.

MG 2302 Business Decision Analysis 3(3-1)

Recommended prerequisite:

MG 2006 Production and

Operations Management

This course focuses on how to make good decision in a complex, dynamic, and uncertain world. Decision analysis uses a structured conversation based on actionable thought to obtain clarity of action in a wide variety of domains. Course contents include distinctions, possibilities and probabilities, relevance, value of information and experimentation, relevance and decision diagrams, and risk attitude.

MG 3001 Strategic Management 3(3-1)

The course aims to familiarize students with the concept of vision, missions, goals, policy determination of the business organization, and tools for strategic analysis. Topics to be discussed include the strategic formulation, strategic implementation of the policy into practice, and the control measures for business functions in the organization.

MG 3002 Business Research Methods 3(3-1)

Recommended prerequisite: MG 1006 Business Statistics

This course emphasizes the nature of research for business decision-making and problem-solving, the choosing of research topic, and the planning and organizing of the research project. Course contents cover sample selection, scaling, the data collection through experimentation, questionnaire and interview, and the descriptive and inferential statistical methods for data analysis and presentation.

MG 3003 Business Ethics and Personal Development 3(3-1)

The course aims to assist students in exploring their personal principles and values, philosophy and vision, strengths and weaknesses in order to set the direction for their learning agenda and career development, as well as to develop personal responsibility and pro-activity relative to their own learning and change. Topics include the principles and tools of learning to learn, self-directed learning, team learning, balance self-renewal and personal mastery, mentoring and coaching, personal project management, corporate governance, and corporate social responsibility.

MG 3004 Management Internship 0(0-40)

Recommended prerequisite: Junior Standing

or Consent from Program Chairperson

The course aims to provide on-the-job management training in modern business organizations or government agencies. Students will have opportunities to learn through hands-on experience how various functional units of an organization operate and how modern technologies can be utilized in a business environment. In addition, students will learn to handle their assigned tasks, collaborate with co-workers, coordinate activities, and develop self-responsibility. The internship period will normally be during the summer session and must be at least 240 business hours. Students must submit a written report at the end of the internship. A satisfactory (S) or unsatisfactory (U) grade will be given based on the student's performance, the quality of the internship report, and the internship supervisor's assessment.

MG 3101 Risk and Insurance Management 3(3-1)

Recommended prerequisites:

MG 1006 Business Statistics

MG 2002 Business Finance

This course is an introduction to risk and insurance management, terminologies, concepts, and systems. Course contents include techniques of identification, analysis, and management of risks through risk control and risk financing. It also includes an overview of the nature and operation of insurance business and the basic principles of insurance which is considered as a risk financing tool.

MG 3102 Business Development Study 3(3-1)

Recommended prerequisite:

MG 2103 Entrepreneurship

This course provides students with basic ideas and procedures to construct business plans and feasibility studies, which are the efficient ways to determine the practicality of projects or the likelihood of success. The course focuses on making rational decisions regarding market feasibility, operational feasibility, schedule feasibility, and economic feasibility.

MG 3103 Business Law and Taxation 3(3-1)

This course introduces the legal system and the policy environment for doing business, including fundamental principles of law and legal system, the concepts of person, property, act and claims, contracts for sale, exchange, hire of service, loan and agency etc, and company formation law including partnership and corporation. It covers the role of government intervention, major areas of government policy and regulations, and their impact on business. Also, focuses will be on international business practices and organizations affecting business globally. Students will learn how to use and apply the Internet to business and legal problems.

MG 3104 Finance and Accounting for Entrepreneurs 3(3-1)**Recommended prerequisites:****MG 1005** Principles of Accounting II**MG 2002** Business Finance

This course covers various aspects of financing and accounting in an entrepreneurial venture. Major topics include attracting seed and growth capital from sources such as venture capital, investment banking, government and commercial banks. Among the issues discussed are valuing a company, going public concern, mergers and acquisitions, selling out, bankruptcy, and different legal forms of organization, partnerships, and taxes.

MG 3105 Entrepreneurial Leadership 3(3-1)**Recommended prerequisite:****MG 2004** Human Resource Management

This course explores the relationship between leadership decision-making and business execution. Students will use biographical materials to analyze the range of models by which leaders and entrepreneurs have integrated, or failed to integrate, beliefs and business practice, in both their decision-making and their execution. Students will then have the opportunity to develop their own vision for integrating values and business practices and to explore the options they have, as well as the barriers they face, in doing so.

MG 3106 International Marketing Management 3(3-1)**Recommended prerequisite:****MG 2001** Principles of Marketing

This course focuses on the marketing problems faced by firms engaging in international trade. Emphasis is placed on influencing factors related to international trade, global competitive analysis, formulation and implementation of international marketing strategies and marketing mix decisions, international logistics, and cross-cultural marketing management.

MG 3201 Global Economic Analysis 3(3-1)**Recommended prerequisite:****MG 2003** Managerial Economics

This course examines the ideas and concepts concerning trade and monetary systems in the global economy. Emphasis is placed on international trade theory and policies, tariff and non-tariff barriers, the impact of strategic protection of industries, and the effects of new technologies. The course also analyzes the consequences of increasing global interdependence on wages and skill levels in labor force, international debt problems, economic integration, and the effects of international sector on domestic growth and stability. Also, current issues related to global and Asian economies will be discussed.

MG 3301 Project Management 3(3-1)**Recommended prerequisite:****MG 3102** Business Development Study

This course examines the identification, selection, and planning of projects. The course will be organized along the first two major phases of the project management process: 1) project selection and definition, and 2) project planning. Students will examine key outcomes, documents, and techniques available for successfully managing the challenges of these two phases. Specific topics covered will include: project selection and scope definition, work breakdown structures and statements of work, risk management planning, project scheduling, project team selection and development, and strengths and weaknesses of various project management tools.

MG 3302 Profit Planning and Control 3(3-1)**Recommended prerequisites:****MG 1005** Principles of Accounting II**MG 2002** Business Finance

This course focuses on management planning and control activities. Specifically, the course explains what budgets are, how they work, how to prepare and present them, including the topic of performance evaluation and the analysis of budget variances. The practical development and use of budgets at various managerial levels within a business are discussed. The course will prepare students for budgeting, financial planning, profit planning, and control.

MG 3303 Logistics and Supply Chain Management 3(3-1)**Recommended prerequisites:****MG 2001** Principles of Marketing**MG 2006** Production and

Operations Management

This course provides an intensive overview of supply chain management including sourcing, manufacturing, and distribution, along with technologies and quantitative models used in managing supply chain. This course also gives student an in-depth understanding of the technologies that businesses used to better manage their supply chain operations. Examples of key technologies covered are enterprise resource planning systems, customer relationship management, advanced planning systems, and data mining.

MG 3401 Employment Procedure and Evaluation 3(3-1)**Recommended prerequisite:****MG 2004** Human Resource Management

This course provides an overview of the process of job advertising, recruiting, written testing, interviewing, and decisions to hire employees at all levels. Topics to be covered include the evaluation of employee performance and a variety of laws governing labor.

MG 3402 Business Psychology 3(3-1)
 This course focuses on behavior, thoughts, and emotions of people as related to their work. Essentially, it covers the psychology of people at work and explores how such knowledge can be used to help people reach their potential and maximize their job satisfaction. Examples of topics covered in this course are historical and current perspectives, practices, and principles of business psychology, personnel selection and assessment, occupational stresses, job satisfaction, ergonomics, working conditions, and safety.

MG 3501 Management Information Systems 3(3-1)
Recommended prerequisite:
MG 2005 Business Information Technology
 This course explores the importance, components, and categories of information systems in business organizations. Students will be exposed to the role and impact of information systems in organization, building information systems in organization, system development, and alternative building approaches such as business intelligence (BI) and knowledge management (KM). Ethics and security issues will also be discussed.

MG 3502 Marketing and Electronic Commerce for Entrepreneurs 3(3-1)
Recommended prerequisite:
MG 2103 Entrepreneurship
 This course offers in-depth study of entrepreneurial marketing strategies and examines how start-ups or small- to medium-sized businesses with distinct needs market within limited budgets. The course compares conventional marketing to "guerilla" marketing, where hands-on, creative methods are keys to survival. This course also provides an overview of electronic commerce and how it can be used in marketing.

MG 4101 Entrepreneurship Clinic 3(0-9)
Recommended prerequisite:
MG 3102 Business Development Study
 Student teams are exposed to real-world business ventures by preparing their own business plans. Each team will work under the guidance of a faculty advisor to complete a one-semester project. Clinic teams present their business reports during regular progress meetings. The final presentation is made in a public forum to members of a judging committee that include liaisons from entrepreneurs and/or investment funding agencies. A complete written business plan is submitted at the time of the final presentation.

MG 4102 Seminar in Entrepreneurship 3(0-9)
Recommended prerequisite: Senior Standing (Entrepreneurship Option)
or Consent from Program Chairperson
 This course aims to promote rigorous intellectual exchanges, both written and oral, in a seminar setting in which all students participate in critical thinking and analysis of argument. Students will engage in relevant issues in entrepreneurship both in the roles of speaker and audience alternately. Seminar topics may include such issues as new venture start-up, venture capital, entrepreneurial strategy, innovation, business incubators, intellectual property, safety, and gender.

MG 4103 Seminar in International Business 3(0-9)
Recommended prerequisite: Senior Standing (International Business Option)
or Consent from Program Chairperson
 This course is organized in a seminar setting in which students alternately participate as speakers and audiences. Each student is required to choose a topic related to international business issues and give a seminar on the selected topic to his/her peers. Recommended issues include globalization, cross-cultural human resource management, international marketing, foreign direct investment, international trade, international monetary system, country selection, and global competitive strategies.

School of Technology

Computer Science Program

CS 1001 Programming Fundamentals 3(3-0)
Recommended co-requisite:
CS 1031 Programming Fundamentals Laboratory
 Overview of computer and programming. Machine level representation of data: numeric data representation and number bases. Fundamental programming constructs: Syntax and semantics of a higher-level language; variables, types, expressions, and assignment; simple I/O; conditional and iterative control structures; functions and parameter passing, recursion. Algorithms and problem-solving: the role of algorithms in the problem-solving process. Fundamental data structures: Primitive types; arrays; strings and string processing. Software development methodology: Fundamental design concepts and principles; structured design; testing and debugging strategies. Social context of computing: social impact of computers and the Internet; professionalism; intellectual property.

CS 1002 Object-Oriented Programming Paradigm 3(2-3)**Recommended prerequisite:****CS 1001** Programming Fundamentals

Review of procedural programming: Control structures, functions, and primitive data types. Object-oriented programming: Object-oriented design; encapsulation and information-hiding; separation of behavior and implementation; classes, subclasses, and inheritance; polymorphism; class hierarchies. Fundamentals of event-driven programming: Event-handling methods, exception handling. Introduction to computer graphics: Using a simple graphics Application Program Interface (API).

CS 1003 Data Structures and Algorithms 3(3-0)**Recommended prerequisite: CS 1002****or TE 1701** Object-Oriented Programming Paradigm

Fundamental computing algorithms: $O(N \log N)$ sorting algorithms; hash tables; binary search trees; representations of graphs; depth- and breadth-first traversals. Recursion: The concept of recursion; recursive mathematical functions; simple recursive procedures; divide-and-conquer strategies; recursive backtracking; implementation of recursion. Basic algorithmic analysis. Algorithmic strategies: Brute-force algorithms; greedy algorithms; divide-and-conquer; backtracking; branch-and-bound; heuristics; pattern matching and string/text algorithms; numerical approximation algorithms.

CS 1009 Computer Programming 3(2-3)

Introduction to structured programming and algorithm design: Lexical elements and basic syntax; simple data types, variables, constants, declarations; block structure, expression, statements, input, output, control structures; function calls; passing parameters by value and by reference; module specification using pre- and post-conditions; use of assertion; one dimensional and multi-dimensional arrays; characters and string handling; testing and debugging techniques; compiler usage.

CS 1010 C++ and Object-Oriented Programming 3(2-3)

This course is intended for students to gain practical programming experience in C++ and visual programming techniques. The course will focus on C++ programming language and object-oriented programming paradigm, major features of C++ and Visual C++ and the object design principles which apply generally in Object-Oriented Languages. Modern programming concepts such as reusability, data abstraction, information hiding, exception handling and object-oriented design will be covered. Programming projects will be required.

CS 1011 Java and Object-Oriented Programming 3(2-3)

This course intended for students to have hands-on experience to gain practical Java programming skills. Topics include introduction to object-oriented programming (classes, objects, messaging, inheritance), Java language features (interfaces, exceptions, packages, concurrency, garbage collection), use of the built-in packages (lang, util, io, networking, awt, swing), applets and servlets, security and verification, Java implementation and the virtual machine. Intensive programming assignments.

CS 1031 Programming Fundamentals Laboratory 1(0-3)**Recommended co-requisite:****CS 1001** Programming Fundamentals

A laboratory course providing hands-on experience with current tools for software prototyping and development to supplement the learning of CS1001. It introduces students to basic concepts and facilities for coding, debugging, and executing programs in a software development environment.

CS 1105 Discrete Mathematics for Computer Science 3(3-0)

Fundamental structures: Functions (surjection, injections, inverses, composition); relations (reflexivity, symmetry, transitivity, equivalence relations); sets (Venn diagrams, complements, Cartesian products, power sets); pigeonhole principle; cardinality and count ability. Basic logic: Propositional logic; logical connectives; truth tables; normal forms (conjunctive and disjunctive); validity; predicate logic; limitations of predicate logic; universal and existential quantification; modus ponens and modus tollens. Digital logic: Logic gates, flip-flops, counters; circuit minimization. Proof techniques: Notions of implication, converse, inverse, contra positive, negation, and contradiction; the structure of formal proofs; direct proofs; proof by counterexample; proof by contraposition; proof by contradiction; mathematical induction; strong induction; recursive mathematical definitions; well orderings. Basics of counting: Counting arguments; pigeonhole principle; permutations and combinations; recurrence relations. Discrete probability: Finite probability spaces; conditional probability, independence, Bayes' rule; random events; random integer variables; mathematical expectation.

CS 1300 Internet and the World Wide Web Technologies 3(2-3)

Background and history of networking and the Internet. Communication and networking: Overview of network standards and protocols; circuit switching vs. packet switching. Introduction to the World-Wide Web: Web technologies; the HTML protocol. Multimedia data technologies: Sound and audio, image and graphics, animation and video; input and output devices; tools to support multimedia development. Interactivity on the web: Scripting languages; the role of applets. Network management: use of passwords and access control mechanisms; domain names and name services; issues for Internet service providers; security issues and firewalls. Network security: Fundamentals of cryptography; secret-key algorithms; public-key algorithms; authentication protocols; digital signatures. Privacy and civil liberties.

CS 2001 Linear Algebra 3(3-0)

Recommended prerequisite: GE 1305 Calculus II
Introduction: vectors and matrices; lengths and dot products. Linear equations: Gaussian elimination; inverse matrices; triangular factors and row exchanges; transposes and permutations. Vector spaces and subspaces: null space, column space, row space, and left null space; rank; solution of m equations and n unknowns; independence, basis, and dimension. Orthogonal: orthogonal of null space, column space, row space, and left null space; projections; least squares approximations; orthogonal bases and Gram-Schmidt orthogonalization. Determinants: properties of determinants; permutations and cofactors; Cramer's Rule, inverses, and volumes. Eigenvalues and eigenvectors: introduction to eigenvalues; matrix diagonalization; applications to differential equations; symmetric matrices; positive definite matrices; similar matrices; singular value decomposition. Linear transformations: linear transformation matrix; change of basis; diagonalization and pseudoinverse. Complex vectors and complex matrices: complex numbers; Hermitian and unitary matrices. Introduction to selected applications of linear algebra: graphs and networks; markov matrices and economic models; linear programming; computer graphics. Numerical linear algebra: graphs and networks; Gaussian elimination in practice; norms and condition numbers; iterative methods for linear algebra. iterative methods for linear algebra.

CS 2100 Algorithm Design and Analysis 3(3-0)

Recommended prerequisite:

CS 1003 Data Structures and Algorithms
Basic algorithmic analysis: Asymptotic analysis of upper and average complexity bounds; best, average, and worst case behaviors; big-O, little-o, omega, and theta notation; standard complexity classes; empirical measurements of performance; time and space tradeoffs in algorithms; using recurrence relations to analyze recursive algorithms. Fundamental algorithmic strategies: Brute-force; greedy; divide-and-conquer; backtracking; branch-and-bound; heuristics; pattern matching and string/text algorithms; numerical approximation. Graph and tree algorithms: Depth- and breadth-first traversals; shortest-path algorithms (Dijkstra's and Floyd's algorithms); transitive closure (Floyd's algorithm); minimum spanning tree (Prim's and Kruskal's algorithms); topological sort.

CS 2106 Theory of Computation 3(3-0)

Recommended prerequisite:

CS 1105 Discrete Mathematics for Computer Science
Regular sets: finite automata, regular expressions, equivalences among notations, methods of proving a language not to be regular. Context free languages: grammars, pushdown automata, normal forms for grammars, proving languages non-context free. Turing machines; equivalent forms, undecidability. Nondeterministic Turing machines: properties, the class NP, complete problems for NP, Cook's theorem, reducibility among problems.

CS 2200 Computer Architecture 3(3-0)

Recommended prerequisites:

CS 1001 Programming Fundamental,
Recommended requisite:
CS 2231 Computer Architecture Laboratory

Digital logic: Fundamental building blocks (logic gates, flip-flops, counters, registers, PLA); logic expressions, minimization, sum of product forms; register transfer notation; physical considerations (gate delays, fan-in, fan-out). Data representation: Bits, bytes, and words; numeric data representation and number bases; representation of nonnumeric data (character codes, graphical data); representation of records and arrays. Assembly level organization: Basic organization of the von Neumann machine; control unit; instruction fetch, decode, and execution; instruction sets and types (data manipulation, control, I/O). Assembly/machine language programming; instruction formats; addressing modes; subroutine call and return mechanisms; I/O and interrupts. Memory systems: Storage systems and their technology; data integrity; memory hierarchy; main memory organization and operations; latency, cycle time, bandwidth and interleaving; cache memories; virtual memory (page table, TLB); fault handling and reliability. Interfacing and communication: I/O fundamentals: handshaking, buffering, programmed I/O, interrupt-driven I/O; interrupt structures: vectored and prioritized, interrupt acknowledgment. External

storage, physical organization; bus protocols and arbitration, direct-memory access (DMA); introduction to networks; multimedia support; raid architectures. Functional organization: Implementation of simple data paths; control unit: hardwired realization vs. micro-programmed realization; instruction pipelining; introduction to instruction-level parallelism (ILP). Multiprocessor and alternative architectures: Introduction to SIMD, MIMD, VLIW, EPIC; systolic architecture; shared memory systems; cache coherence; memory models and memory consistency. Performance enhancements: RISC architecture; branch prediction; perfecting; scalability. Contemporary architectures: Hand-held devices; embedded systems; trends in processor architecture.

CS 2205 Operating Systems 3(3-0)
Recommended co-requisites:

CS 2200 Computer Architecture
CS 2232 Operating Systems Laboratory

Overview: Emphasis is given to fundamental operating system concepts including Mutual Exclusion, Deadlock, Concurrency and Scheduling of process and thread; Memory Management techniques including Virtual Memory, Overlay, Caching and Swapping; Device Management; File Management including introduction to NFS, UFS, etc. Advanced topics, such as Security and Protection, Recovery, Real-Time and Distributed Systems is also covered.

CS 2231 Computer Architecture 1(0-3)
Laboratory

Recommended co-requisite:

CS 2200 Computer Architecture

A laboratory course providing a hands-on experience in building a simple computer system as well as writing and debugging simple programs using assembly codes. Software tools and hardware laboratory will be used for this course. These tools include instruction set simulators, cache performance simulator, and benchmarking systems for performance evaluation. Simple I/O interfacing devices such as A/D and D/A converter, 7-segment LED display, small robot arms, external devices control using assembly language programming.

CS 2232 Operating Systems 1(0-3)
Laboratory

Recommended co-requisite: **CS 2205** Operating Systems

A laboratory course providing a hands-on experience in system administration and system programming. Students will have an opportunity to practice on system installation, halting and booting the system, configuring file systems and file and directory permission structures, print and disk quotas, device configuration and management, client administration, security, user account administration, the use of schedulers and simple system scripting to ease system administration tasks. Unix or Linux and Windows servers will be among the systems studied.

CS 2300 Data Communication and Networking 3(3-0)

Recommended prerequisite:

CS 2200 Computer Architecture

Recommended co-requisite:

CS 2331 Data Communication and Networking Laboratory

Overview: Introduction to the architectures and protocols of computer networks: ISO 7-layer reference model and TCP/IP protocol suite; basic data communication concepts such as, circuit switching and packet switching; streams, socket and datagrams; physical layer networking concepts; data link layer concepts; internetworking and routing; transport layer services, data link control, multi-access techniques, routing and flow control; Internet protocols (TCP/IP): network layer (IP, ICMP), transport layer (TCP and UDP), gateway and routing protocols (ARP, RARP, GGP, EGP, RIP, OSPF), network topology, data communication sub-systems, error control coding, local area network, wireless and mobile networking, interconnection of packet-switching networks (wide area networking), network security and management, and various networking applications and tools.

CS 2331 Data Communication and Networking Laboratory 1(0-3)

Recommended co-requisite:

CS 2300 Data Communication and Networking

A course providing a hands-on experience in network programming and protocol simulation. Performance of classic protocols such as STOP-AND-WASIAN INSTITUTE OF TECHNOLOGY, ARQ, GO BACK n, SELECTIVE REPEAT, and other selected conventional protocols will be evaluated using software simulation. Students will have an opportunity to write data communication and networking software using a high level programming language. Simple networking software projects, BSD sockets interfacing, ftp and HTTP server, SNMP mail server. The last part of this course will be dedicated to network programming and intranet configurations such as IP sub netting, routing and firewall configuration using industry standard network switches and routers.

CS 2401 Theory of Programming Languages 3(3-0)

Recommended prerequisite:

CS 1003 Data Structures and Algorithms

Overview of programming languages: History of programming languages; brief survey of programming paradigms; the role of language translation in the programming process. Fundamental issues in language design: General principles of language design; design goals; typing regimes; data structure models; control structure models; abstraction mechanisms. Lexical analysis: Application of regular expressions in lexical scanners; hand-coded vs. automatically-generated scanners; formal definition of tokens; implementation of finite-state automata. Syntactic analysis: Formal definition of grammars; BNF and EBNF; bottom-up vs.

top-down parsing; tabular vs. recursive-descent parsers; error handling; automatic generation of tabular parsers; symbol table management; the use of tools in support of the translation process. Models of execution control: Order of evaluation of sub expression; exceptions and exception handling; runtime systems. Declaration, modularity, and storage management: Declaration models; parameterization mechanisms; type parameterization; mechanisms for sharing and restricting visibility of declarations; garbage collection. Type systems: Data type as set of values with set of operations; data types; type-checking models; semantic models of user-defined types; parametric polymorphism; subtype polymorphism; type-checking algorithms.

CS 2402 Programming Language Translation 3(3-0)

Recommended prerequisites: CS 2100, CS 2106, CS 2200, and CS 2401

Review of concepts in programming languages. Virtual machines: The concept of a virtual machine; hierarchy of virtual machines; intermediate languages. Introduction to language translation: Comparison of interpreters and compilers; language translation phases; machine-dependent and machine-independent aspects of translation; language translation as a software engineering activity. Interpretation: Iterative vs. recursive interpretation; iterative interpretation of intermediate code; recursive interpretation of a parse tree. Code generation: Intermediate and object code; intermediate representations; implementation of code generators; code generation by tree walking; context-sensitive translation; register use. Optimization: Machine-independent optimization; data-flow analysis; loop optimizations; machine-dependent optimization.

CS 2505 Computer Graphics and Multimedia 3(3-0)

Recommended prerequisite:

CS 1003 Data Structures and Algorithms

Graphic systems: Raster and vector graphics systems; video display devices; physical and logical input devices; issues facing the developer of graphical systems. Fundamental techniques in graphics: Hierarchy of graphics software; using a graphics API; simple color models; homogeneous coordinates; affine transformations; viewing transformation; clipping. Graphical algorithms: Line generation algorithms; structure and use of fonts; parametric polynomial curves and surfaces; polygonal representation of 3D objects; parametric polynomial curves and surfaces; introduction to ray tracing; image synthesis, sampling techniques, and anti-aliasing; image enhancement. Principles of human-computer interaction: Human-centered software development and evaluation. Graphical user-interface design: Choosing interaction styles and interaction techniques; HCI aspects of interface design; dynamics of color; structuring a view for effective understanding. Graphical user-interface programming: Graphical widgets; event management and user interaction; GUI builders and programming

environments. Computer animation: Key-frame animation; camera animation; scripting system; animation of articulated structures; motion capture; procedural animation; deformation. Multimedia techniques: Sound, video, and graphics; design of multimedia systems; tools for multimedia development; virtual reality.

CS 2506 Computer Animation Production 3(2-3)

The focus of this course is on image processing, compositing and 3D animation. Topics include: History and applications of computer animation; Introduction to basic principles of computer generated animation; Computer animation software; Language, processes and equipment of digital animation and its production environment; Computer platforms are used to explore and provide a framework for state-of-the-art digital storytelling. Students will learn the entire production pipeline from story idea and development to recording animations to media.

CS 2600 Artificial Intelligence 3(3-0)

Recommended prerequisite:

CS 1003 Data Structures and Algorithms

Fundamental issues in intelligent systems: History of artificial intelligence; philosophical questions; fundamental definitions; modeling the world; the role of heuristics. Search and constraint satisfaction. Knowledge representation and reasoning. Bayes theorem. Advanced search: Genetic algorithms; simulated annealing; local search. Agents: Definition of agents; successful applications and state-of-the-art agent-based systems; software agents, personal assistants, and information access; multi-agent systems. Machine learning and neural networks. AI planning systems.

CS 2700 Databases 3(3-0)

Recommended prerequisite:

CS 1002 Object-Oriented

Programming Paradigm

Co-requisite: CS 1003 Data Structures and Algorithms

Database systems: History and motivation for database systems; components of database systems; DBMS functions; database architecture and data independence. Data modeling: Data modeling; conceptual models; object-oriented model; relational data model. Relational databases: Mapping conceptual schema to a relational schema; entity and referential integrity; relational algebra and relational calculus. Database query languages: Overview of database languages; SQL. Relational database design: Database design; functional dependency; normal forms; multivalued dependency; join dependency; representation theory. Transaction processing: Transactions; failure and recovery; concurrency control.

CS 2701 Information Management 3(3-0)
Recommended prerequisite:**CS 1003** Data Structures and Algorithms

Overview of information management: History and motivation for information systems; common problems of information management; the business perspective. Social issues in information technology: Intellectual property; computer crime; privacy; security and civil liberties; the need for a legal and ethical framework; guidelines for computer use. Introduction to database systems: History and motivation for database systems; components of database systems; DBMS functions; database architecture and data independence; use of a database query language; the relational model. Building databases: Underlying methodology; database query languages; particular database issues. Information systems to serve particular purposes: Intranets and extranets; the information retrieval problem. Design and development of information systems: Database design; relational database design; life-cycle issues. Security and control issues: Overview of problems and standard solutions; database integrity; transactions; the role of encryption. Evaluation of information systems.

CS 2702 Business Information Systems 3(3-0)

Introduction to business information systems, computer hardware and software, overview of programming and computer languages, input/output and storage devices, files, files design, database fundamentals, use of application software for business data processing, word processing, spreadsheets and database management systems, SDLC in system analysis.

CS 2707 Electronic Commerce and Trading Information Systems 3(3-0)
Recommended prerequisite:**CS 1001** Programming Fundamentals

Foundations of Electronic Commerce; E-commerce infrastructures, EC field classification(B2C,B2B,C2C,C2B). Internet consumer satisfaction models, Internet consumers and market research, e-shopping and e-malls concepts, tools and scripting languages for EC site construction; CGI and CGI variables related to EC applications. Integrating database server, web-server, firewall and proxy servers for EC applications, EC site networking models. Search engine, mobile agents; web-robots and spiders. Customer movements tracking methods using cookies, data mining, neural computing and intelligent agents. Electronic Payment systems and related technologies such as e-cash, smart cards, SET, SSL and EDI. Implementation of cryptography and digital signatures in E-payment systems. EC strategy and implementation, software agents, agents design tools. Planning, design and construction of EC-sites; security, trade secrets and legal issues in electronic commerce.

CS 2708 Knowledge-Based Systems 3(3-0)

Recommended prerequisite: **CS 2700** Databases
Basic concepts in knowledge-based systems, knowledge representation schemes, knowledge organization and processing, domain analysis and knowledge acquisition, and knowledge-based and expert systems development process.

CS 2901 Software Development 3(3-0)
Recommended co-requisite:**CS 1003** Data Structures and Algorithms

Event-driven programming. Using application programmer interfaces (APIs): API programming; programming by example; debugging in the api environment; component-based computing. Computer graphics: Introduction to human-computer interaction (HCI): human performance models; accommodating human diversity; principles of good design and good designers; engineering tradeoffs; introduction to usability testing. Human-centered software evaluation: Setting goals for evaluation; evaluation strategies. Human-centered software development: Approaches, characteristics, and overview of process; prototyping techniques and tools. Graphical user interfaces (GUIs): Graphical APIs; choosing interaction styles and interaction techniques. Software development techniques: Object-oriented analysis and design; component-level design; software requirements and specifications; prototyping; characteristics of maintainable software; software reuse; team management; project scheduling.

CS 3000 Object-Oriented Software Development 3(2-3)**Recommended prerequisite:****CS 1003** Data structure and Algorithm

The course provides an implementation-oriented introduction to the object-oriented software-development techniques for creating medium-scale interactive applications, focusing on the use of object-oriented libraries to create well-designed graphical user interfaces. Topics include advanced programming features, event-driven programming, application programming interface (API), computer graphics, human-computer interaction (HCI), and graphical user interfaces.

CS 3003 Modeling and Simulations 3(3-0)
Recommended prerequisite:**CS 2100** Algorithm Design and Analysis

Random numbers, pseudorandom number generation and testing, Monte Carlo methods, introduction to distribution functions. Emphasis is on simulation modeling, discrete-event simulation, continuous simulation, verification and validation of simulation models, input analysis, output analysis, queuing theory models, sample applications, design, code, test, and debug simulation programs. Modeling and simulation applications in business and management.

CS 3004 Computer Models for Business Decisions 3(2-3)

Principles, techniques, and applications of computer models in business and industry; decision support systems based on spreadsheets; project management; Monte Carlo simulation, forecasting, service levels and inventory control and financial modeling; application of personal computer software packages to carry out sensitivity analysis on a range of data.

CS 3103 Security and Cryptography 3(3-0)
Recommended prerequisite:

CS 1105 Discrete Mathematics for Computer Science

Information security components, principles, problems; type of threats, include hackers, viruses, natural disasters, fraud, vandalism and counter-measures in a computing and communications system; study of major, real-life, disastrous security breaches; analysis of breaches and risks; study of security philosophies, methodologies, models, techniques and controls. Topics should be emphasized on fundamentals of cryptography, secret-key algorithms, public-key algorithms, authentication protocols, digital signatures, examples of cryptographic software and their implementations. Network security, virtual private network and firewalls must be covered extensively.

CS 3201 Introduction to Embedded System Design 3(2-3)**Recommended prerequisite:**

CS 2200 Computer Architecture

A design project course providing introduction to analysis and design of embedded systems. Overview and comparison of candidate microcontrollers for design project. Outline of salient differences between conventional single-chip microcontrollers and DSP microprocessors. Application of hardware and software development tools, peripheral components such as A/D converters, communication controllers, signal processing, stepper motor and DC motor control and interfacing devices. Modeling of electromechanical systems. Laboratory part includes writing programs to control micro mouse robot, robot arm, DC and stepper motors, and processes such as level and flow of liquid or temperature.

CS 3206 Real-Time Computing 3(3-0)**Recommended prerequisite:** **CS 2205** Operating Systems

Real-time development methodologies, real-time language constructs real-time kernels, real-time hardware architectures, requirements specification, system design and implementation, testing, real-time programming, low-level software issues and hardware architectures.

CS 3300 Service-Oriented Architecture 3(2-3)**Recommended prerequisite:**

CS 3000 Object-Oriented Software Development

The course provides concepts, specifications, standards behind service orientation and Web Services, and introduction to Service-Oriented Architecture design and development. Topics include Service-Oriented Architecture and Web services fundamentals, WS-*extensions, service-orientation, Service-Oriented Architecture planning, Service-Oriented Architecture design and analysis, Service-Oriented Architecture technology, and introduction to grid computing.

CS 3302 Mobile and Wireless Computing 3(3-0)**Recommended prerequisite:**

CS 2300 Data Communication and Networking

Introduction to mobile communication system. Topics include models of the mobile communication channels, access and mobility control, mobile network architectures, connection to the fixed network, and signaling protocols for mobile communication systems. Examples of mobile communication systems are presented, including the pan-European GSM system, the North American D-AMPS system, Personal Communication Systems, WAP, GPRS and their implementation in mobile and portable computers and PDAs. Topics include wireless LAN architectures and protocols, considerations and risks analysis regarding implementation of wireless LANs technology.

CS 3304 Concurrency and Distributed Systems 3(3-0)**Recommended prerequisite:**

CS 2300 Data Communication and Networking

Introduces concurrency in the context of distributed systems. The course covers both the abstract principles of concurrent programming and their concrete realization in distributed, network-based systems. Topics include the basic theory of concurrency, hardware and software features to support concurrency, concurrent and distributed algorithms, and middleware.

CS 3500 Multimedia Systems 3(2-3)**Recommended prerequisites:**

CS 2505 Computer Graphics and Multimedia

The course focuses on recent advances in multimedia technologies and design issues of large-scale multimedia systems with real-time-display functions. Examples of such systems are digital editing systems, digital libraries, and entertainment databases (video-on-demand, interactive TV). Topics discussed in this course include: Multimedia data representations and compression standards, Multimedia content description and presentation; Multimedia authoring and production; Multimedia transmission over Internet and mobile

devices; Multimedia streaming technologies; Streaming media system architecture; Internet streaming; Multimedia communication standards; Content based image and video retrieval techniques, Multimedia database systems - - indexing, browsing and retrieval.

CS 3501 Game Design and Development 3(2-3)

Recommended prerequisites:

CS 1003 Data Structure and Algorithms

CS 1300 Internet and the World Wide Web Technologies

The course examines core techniques and algorithms in game programming as well as the key elements of game design and development which includes: Genres of games, Artificial intelligence and network programming techniques useful for game programming; Mobile, on-line and multi-player game engine creation Game design and development process; Game project planning and managing; Game concepts and worlds; Storytelling; Character and user interface design; Launching and managing games.

CS 3507 Computer Vision 3(3-0)

Recommended prerequisites: CS 1001 and CS 2001

An introduction to the underlying concepts of computer vision and image understanding. The course will consider fundamental topics, including image formation, edge detection, texture analysis, color, segmentation, shape analysis, detection of objects in images and high level image representation, stereo, motion, shape representation and recognition, image database retrieval or robotic vision. Programming assignments are an integral part of the course.

CS 3601 Machine Learning and Neural Networks 3(3-0)

Recommended prerequisite:

CS 2600 Artificial Intelligence

The subject will include decision tree algorithms, covering algorithms (such as AQ), instance based learning, case-based learning, nearest neighbor classifiers, genetic algorithms, inductive logic programming and theoretical analysis of learning algorithms. Neural network topics will include network architectures, such as perceptions, Hopfield and Kohonen nets, ART models, back-propagation trained feed-forward networks, recurrent nets, and weightless nets.

CS 3603 Robotics 3(2-3)

Recommended prerequisite: CS 1001 or CS 1010 or CS 1011, or CS 2001

Manipulator kinematics and inverse kinematics; manipulator dynamics, motion and force control; motion planning and robot programming, sensor-based collision avoidance, assembly planning, task specifications, and robot-human interfaces. Hands-on experience with robotic manipulation and navigation systems.

CS 3700 Introduction to Bioinformatics 3(3-0)

The course discusses an overview to bioinformatics which provides a summary of fundamentals of both bioscience and information science with a technical bridge between the two disciplines ; Topics include: The emergence of bioinformatics; Public database infrastructure; Database infrastructure for bioinformatics; Traditional bioinformatic tools and algorithms; Gene structure; Computational techniques for sequence analysis; Transcription; Protein translation process; Protein structure prediction; Medical informatics and information-based medicine, and Medical research in bioinformatics.

CS 3708 Decision Support Systems 3(3-0)

Recommended prerequisite: CS 2700 Databases

This course explores the role of decision support systems in organizations. Several types of information system that specifically support managerial decision makers are investigated, including Group Decision Support Systems, Data Warehouses and Expert Systems. The development, implementation and application of these systems, how they can be applied to current business problems, as well as how organizational issues impact on their implementation and usage are all considered.

CS 3709 Knowledge Management 3(3-0)

Recommended prerequisite: CS 2700 Databases

This course examines computer-based systems for supporting knowledge management (KM). Principles of developing systems for KM are explored. System architectures, tools and techniques, and their use in capturing, storing, locating, evaluating, disseminating, and using information and knowledge are examined. Topics will include techniques for indexing, searching, retrieving, and displaying information from knowledge bases. Investigation of the issues in the application of knowledge management to organizational learning and decision making is included. Application of these principles and techniques through the use of rapidly evolving information/communication technologies is studied in the context of their impact on organizations.

CS 3801 Information Technology Laws, Regulations, and Ethics 3(3-0)

Social context of computing; Introduction to the social implications of computing; social implications of networked communication; growth of, control of, and access to the Internet; gender-related issues; international issues; international and local laws for regulation of information technology business and individual practices. Codes of ethics, conduct, and practice. Historical examples of software risks; implications of software complexity; risk assessment and management. Intellectual property: Foundations of intellectual property; copyrights, patents, and trade secrets; software piracy; software patents; transnational issues concerning intellectual property. Privacy and civil liberties: Ethical and legal basis for privacy protection; privacy implications of massive database systems; technological strategies for privacy protection; freedom

of expression in cyberspace; international and inter-cultural implications. Economic issues in computing; Monopolies and their economic implications; effect of skilled labor supply and demand on the quality of computing products; pricing strategies in the computing domain; differences in access to computing resources and the possible effects thereof.

CS 3803 Special Topics in Computer Science I 3(3-0)

This course covers one or more advanced topics in computer science. It is offered only when there is an opportunity to present material not included in the established curriculum or to keep track of latest development in computer science and information.

CS 3804 Special Topics in Computer Science II 3(3-0)

This course covers one or more advanced topics in computer science. It is offered only when there is an opportunity to present material not included in the established curriculum or to keep track of latest development in computer science and information.

CS 4920 Summer Internship 0(0-40)

Practical interesting project on various fields of computer science. Project duration is at least 160 hours but recommended is 320 hours or more.

CS 4921 Computer Science Project I 1(0-3)
Recommended prerequisite:

CS 2901 Software Development

Part I of a research project in which a small group of students carry on an investigative study on an approved topic in the area of computer science under the supervision of an instructor. The purpose of this course to provide the students with experience in planning and conducting independent computer science research, system development, or software design projects. The project topic is usually in concert with the research interests of individual faculty members. A progress report at the completion of the course is required.

CS 4922 Computer Science Project II 3(0-9)
Recommended prerequisite:

CS 4921 Computer Science Project I

Part II of a research project which is a continuation of CS4903. An oral examination is required at the end of the project where the students give a presentation and a demonstration of the working project to the project committee. A final report must also be submitted.

SE 3506 Human-Computer Interaction 3(3-0)

Recommended prerequisite:

CS 1003 Data Structures and Algorithms

Foundations of human-computer interaction: Motivation; contexts for HCI; human centered development and evaluation; human performance models; accommodating human diversity; principles of good design and good designers; engineering tradeoffs; usability and affordances; direct manipulation; systematic design methods; user conceptual models and interface metaphors; design languages and genres; human cognitive and physical ergonomics; information and interactivity structures; design tools and environments; introduction to usability testing. Human-centered software evaluation: Setting goals for evaluation; evaluation without users; evaluation with users. Human-centered software development: Approaches, characteristics, and overview of process; functionality and usability; specifying interaction and presentation; prototyping techniques and tools. Graphical user-interface design: Choosing interaction styles and interaction techniques; HCI aspects of common widgets; HCI aspects of screen design; handling human failure; beyond simple screen design; multi-modal interaction; 3D interaction and virtual reality. Graphical user-interface programming: Dialogue independence and levels of analysis; widget classes; event management and user interaction; geometry management; GUI builders and UI programming environments; cross-platform design. HCI aspects of multimedia systems: Categorization and architectures of information; information retrieval and human performance; HCI design of multimedia information systems; speech recognition and natural language processing; information appliances and mobile computing. HCI aspects of collaboration and communication: Groupware to support specialized tasks; asynchronous group communication; synchronous group communication; online communities; software characters and intelligent agents.

SE 3704 Data Mining and Warehousing 3(3-0)

Recommended prerequisite: **CS 2700** Databases
Concepts and techniques in data mining and their multidisciplinary applications. Topics include data bases; data cleaning and transformation; concept description; association and correlation rules; data classification and predictive modeling; performance analysis and scalability; data mining in advanced database systems, including text, audio, and images; and emerging themes and future challenges. Important aspects of data warehousing, definitions of terminology and purposes of a data warehouse, data warehouse design, data sourcing, implementing the data warehouse, delivery of data from the warehouse to the manager, tools and organizational issues involved in designing and implementing a data warehouse and case studies of data warehousing practice.

SE 3901 Software Engineering 3(3-0)
 Software processes: software life cycle and process models, process assessment models, and software process metrics; software requirements and specifications; software design; software validation: validation planning, testing fundamentals includes test plan creation and test case generation, black-box and white-box testing techniques, unit, integration, and system testing, object-oriented testing, and inspections; software evolution: software maintenance, characteristics of maintainable software, reengineering, legacy systems, and software reuse.

SE 3902 Software Project Management 3(3-0)
 Fundamental issues in the management and economics of a software engineering project in the context of the software development lifecycle. Techniques for project planning (cost estimation, budgeting and scheduling), controlling (including quality assurance and configuration management), risk analysis and risk management, organizing, staffing, and directing a software project (leadership and motivation). Capability maturity model (CMM), and contemporary issues in management.

SE 3903 Software Validation and Verification 3(3-0)
Recommended prerequisite:
SE 3901 Software Engineering
 Theory and practice of software testing. V&V terminology and foundations, including metrics and measurement (e.g. reliability, usability, performance). Methods for evaluation software for correctness, and reliability, including code inspections, program proofs and testing methodologies. Formal and informal proofs of correctness. Unit and system testing techniques. Coverage analysis (e.g. statement, branch, basis path, multi-condition, dataflow). Black-box functional testing techniques. Integration testing. Developing test cases based on use cases or customer stories. Operational profile-base testing. System and acceptance testing. Testing across quality attributes (e.g. usability, security, compatibility, accessibility).

SE 3904 Software Requirements Specification and Management 3(3-0)
 Basic concepts and principles of software requirements engineering, its tools and techniques, and methods for modeling software systems. The requirements engineering process, including requirements elicitation, specification, documentation, and validation. Functional and non-functional requirements. Layers/levels of requirements (e.g. needs, goals, user requirements, system requirements, software requirements). Metrics of software requirements. Prototyping user interfaces. Basic concepts of formal specification techniques. Scenario analysis. Conventional, object-oriented and goal-oriented methodologies. Managing changing requirements. Requirements management (e.g. consistency management, release planning, reuse). Use of computer-Aided Software Engineering (CASE) tools to illustrate analysis concepts.

SE 3905 Software Process and Quality Assurance 3(3-0)
Recommended prerequisite: SE 3901 Software Engineering
 Process concepts, including themes and terminology, process infrastructure (e.g. personnel, tools, training, etc.), modeling and specification of software processes, measurement and analysis of software processes, software engineering process improvement, quality analysis and control (e.g. defect prevention, quality metrics, root cause analysis). Process implementation, including life cycle models (e.g. waterfall, incremental, spiral), life cycle process models and standards (e.g., IEEE, ISO), individual software process and team software process. Software quality concepts and culture. Software quality standards. Software quality processes. Process assurance and product assurance.

SE 3906 Software Architecture 3(3-0)
 Introduction to software design with emphasis on architectural design. Concepts and activities for software architecture design. Notations, models, and specification languages for software architecture design, Techniques, methods, tools for designing, building, analyzing, and evaluating software architecture. Object-oriented approach for software architecture design. Macro-level software system architectures with an emphasis on approaches to interconnection and distribution of system components. Models of software architecture. Architecture styles and patterns, including explicit, event-driven, client-server, and middleware architectures. Decomposition and composition of architectural components and inter actions. Use of non-functional requirements for tradeoff analysis. Micro-level architecture including patterns, frameworks, and component-based software engineering. Management of software architecture design. Reuse of software architecture design.

SE 3907 Object-Oriented System Analysis and Design 3(3-0)
Recommended prerequisite:
CS 1002 Object-Oriented Programming Paradigm
 Review of object-oriented software development. The features and key principles of object-oriented modeling, analysis and design. Unified Modeling Language (UML) and object-oriented modeling techniques. Introduction to Design Patterns; using design patterns with UML. Students will work on team projects of their choice during the semester.

TE 2001 Mathematics III 3(3-0)
Recommended prerequisite: GE 1305 Calculus II
 Calculus of several variables and differential equation. Vector algebra in 3-space, vector-valued functions of one variable, scalar functions of several variables, partial differentiation, gradient, multiple integration, line integrals and surface integral; first-order and higher-order ordinary differential equation, series solution of ordinary differential equation, partial differential equation and boundary value problem; applications in engineering.

TE 2002 Mathematics IV **3(3-0)**
Recommended prerequisite: GE 1305 Calculus II
 Difference equation, solution by finite difference and numerical analysis; systems of equations, vector spaces, Eigenvalues, Eigenvectors, similarity; complex analysis, function of complex variables, complex integral, series and residue, conformal mapping; applications in engineering.

TE 2003 Signals and Systems **3(0-3)**
Recommended prerequisite: GE1305 Calculus II
 Continuous-time and discrete-time signals and systems, representation of signals and systems, Fourier series, Fourier integral, Fourier transform, Laplace transform, linear system, impulse response, frequency response, transfer/system function; sampling theorem and convolution integral/sum.

TE 2004 Signals and Systems **3(3-0)**
Recommended prerequisite: GE 1305 Calculus II
 Continuous-time and discrete-time signals and systems; representation of signals and systems; description and analysis of systems; Fourier series; Fourier transform; correlation and spectral density; Laplace transform; Z-transform; transfer/system function; sampling theorem.

TE 2201 Electric Circuits **3(3-0)**
Recommended prerequisite: GE 1214 Physics II
 Laws and theories of electric circuits, Ohm's laws, Kirchoff's laws, Superposition Theorem, Thevenin and Norton equivalence, node and mesh analysis, RLC circuit, steady state response and transient response, stimulated response, ac circuit, analysis using phasor, three-phase ac circuit, two port network.

TE 2204 Engineering Electronics **3(3-0)**
Recommended prerequisite: TE 2201 Electric Circuits
 Fundamentals of semiconductor materials, diode and its applications, transistor, BJT as an amplifier and as a switch, frequency response of BJT amplifier, multistage amplifier, power amplifier, FET and MOSFET, solid state switch (SCR, DIAC, TRIAC, and UJT), feedback theory, operational amplifier, differential amplifier, analog filter design, noise in amplifier circuit.

TE 2205 Electric Machines **3(3-0)**
Recommended prerequisite: TE 2201 Electric Circuits
 Energy and energy transfer study, magnetic circuit calculation, transformers, characteristic of machines, single phase, three phase, associate circuit, transformer connection, structure and characteristic of machine, direct current, speed control, protection, basic A.C. machine.

TE 2206 Fundamentals of Electronic Circuits Design **3(2-3)**
 Resistor network theory; properties of AC and DC signals; time-frequency relationship; capacitive and inductive circuits; circuit analysis with multi-meter and oscilloscope; semiconductor basics; diode; BJT; MOSFET; transistor as amplifier and switch; nano-switching; Logic Gates; basics of the photo-electric effect; photodiode; LED; Laser. Lab and tutorials are integrated components of the course.

TE 2207 Electronic Circuits and Measurements **3(2-3)**
 AC and DC signal properties; Voltage and current sources; Ohm's law and Kirchoff's laws; Resistors in series and parallel; Multimeter; Superposition theorem; Thevenin and Norton theorems; Power and maximum power transfer; Oscilloscope; RLC circuits and applications; Semiconductor materials; Diode and applications; MOSFET as amplifier and switch; CMOS logic; Nano switches; OPAMP basics; Labs and seminars are an integrated part of the course.

TE 3001 Electromagnetic Fields and Waves **3(3-0)**
Recommended prerequisite:
TE 2001 Mathematics III
 Vector analysis, Maxwell's equations in free space, Maxwell's equations and boundary conditions for material regions at rest, static and quasi-static electric fields, static and quasi-static magnetic fields, plane waves solution, plane wave reflection and transmission at planar boundaries, the Poynting theorem and electromagnetic power, transmission, TEM waves on two-conductor transmission lines, introduction to radiation from an antenna.

TE 3002 Probability and Stochastic Processes **3(3-0)**
Recommended prerequisite:
TE 2001 Mathematics III
 Experiments, models, and probabilities; discrete random variables; multiple discrete random variables; continuous random variables; multiple continuous random variables; stochastic processes; sums of random variables; the sample mean; statistical inference; random signal processing; renewal processes and Markov Chains.

TE 3101 Principles of Communications **3(3-0)**
Recommended prerequisite:
TE 2002 Mathematics IV
 Signal and system, Fourier series and transform, transfer function, analog modulation, sampling theorem, digital modulation, pulse analog modulation, pulse digital modulation, delta modulation, frequency, time, and code division multiplexing, noise in communication systems, noise factor and signal-to-noise ratio, information theory, examples of some real communication systems.

TE 3103 Analog and Digital Communications 3(3-0)**Recommended prerequisite:** TE 2003 Signals and Systems

Analog modulation, sampling theorem, digital modulation, pulse analog modulation, pulse digital modulation, delta modulation, frequency, time, and code division multiplexing, noise in communication systems, noise factor and signal-to-noise ratio, information theory, examples of some real communication systems.

TE 3104 Communication Systems I 3(3-0)**Recommended prerequisite:** TE 2004 Signals and Systems

Review of continuous-time signals and systems; signal transmission and filtering; analysis and implementation of amplitude modulation; phase and frequency modulation schemes; random processes; random signals and noise; Pulse-Code modulation; delta modulation; digital multiplexing.

TE 3105 Communication Systems II 3(3-0)**Recommended prerequisite:**

TE 3104 Communication Systems I

Digital modulation systems; inter-symbol interference; equalization; synchronization; ASK; FSK; PSK; MSK; optimal receiver; non-coherent detection; digital transmission through the AWGN channel; introduction to information theory; source coding; channel capacity; channel coding; wireless communications; spread-spectrum communication systems; digital cellular communication systems.

TE 3106 Communication Systems 3(2-3)**Recommended prerequisite:**

TE 3205 Digital Signal Processing

TE 3208 Embedded Platforms

Random signals and noise; Analog modulation and demodulation; Digital modulation and demodulation; PLL, Spread Spectrum; Channel, line and error coding; Emphasis is on implementation on embedded platforms; Labs and seminars are an integrated part of the course.

TE 3201 Digital Signal Processing 3(3-0)**Recommended prerequisite:**

TE 2002 Mathematics IV

Review of ADC and DAC, discrete time signals and systems, sampling theorem. Discrete-Time Fourier Transform (DTFT), Fast Fourier Transform (FFT), Z-transform, digital filtering basic digital signal processing algorithms, DSP chips, fixed-point processing, floating-point processing, parallel processing, some applications of DSP.

TE 3204 Microprocessor Theory and Applications 3(3-0)**Recommended prerequisite:**

TE 2203 Digital and Logic Circuits

Revision of logic circuits, arithmetic circuits, flip-flops, registers, memory units, example of a simple microprocessor for studying the hardware structure, clock signal, bus system, instruction set, programming,

addressing modes, usage of stack, microprocessor programming and interfacing techniques, examples of microprocessor applications.

TE 3205 Digital Signal Processing 3(3-0)**Recommended prerequisite:** TE 2004 Signals and Systems

ADC and DAC; discrete time signal; sampling and Discrete-Time Fourier Transform (DTFT); Fast Fourier Transform (FFT); Z-transform; basic digital signal processing algorithms; DSP chips; fixed-point processing; floating-point processing; parallel processing; example applications of DSP.

TE 3206 Embedded System Design 3(2-3)**Recommended prerequisite:**

CS 2200 Computer Architecture

or TE 2206 Fundamentals of Electronic Circuits Design

SOP and POS structure of combinational logic; PLA and PAL structure; properties of RS, JK, D and T flip-flops; state machine design; FPGA structure and programming; overview of ASICs; RISC processor architecture; instruction set; RISC programming and interfacing techniques; RISC processor applications. Lab and tutorials are integrated components of the course.

TE 3207 Communication Electronics 3(3-0)**Recommended prerequisite:**

TE 2204 Engineering Electronics

Electronic components and integrated circuits for communication systems: Low-noise and linear amplifiers, oscillators, phase locked loop and frequency synthesizer, mixers, modulators, demodulators, filters, analog-to-digital and digital-to-analog converters, single-chip transceivers. Examples of commercially available components and chips, their specifications and applications.

TE 3208 Embedded Platforms 3(2-3)**Recommended prerequisite:**

CS 2200 Computer Architecture

Review of logic gates, flip-flops, counters and multiplexers; Integer, fixed point and floating point data formats; Adders, Multipliers and dividers; Programmable logic; Verilog HDL; FPGA programming; Signal propagation and signal integrity in FPGA; State machine design; RISC and CISC concepts; ARM architecture (entry level core) and ARM assembly; Labs and seminars are an integrated part of the course.

TE 3209 Data Acquisition Systems and Virtual Instrumentation 3(2-3)

Introduction to computer-based measurement and instrumentation systems, data acquisition systems and instrumentation. Virtual instrumentation (VI) programming and applications for signal processing, communications, industrial applications such as datalogging, data analysis, instrumentation and control will be discussed. Labs and seminars are an integrated part of the course.

TE 3701 Java Programming 3(3-0)
Java's language fundamentals. Applications and applets. Flow control and data structures. Basic Java packages. Files, input/output, graphical user interfaces, and drawing primitive graphics in Java. Exception handling and garbage collection. Multi-threaded programming. Programming XML in Java. Java Database Connectivity. Java Server Pages technology. Enterprise Java Bean essentials. Java's networking features.

TE 3801 Digital Signal Processing Laboratory 1(0-3)
Recommended prerequisite or co-requisite:
TE 3201 Digital Signal Processing
This laboratory course is designed to provide hands-on experience to supplement the learning of the course TE3201.

TE 3802 Microprocessor Laboratory 1(0-3)
Recommended prerequisite or co-requisite:
TE 3204 Microprocessor Theory and Applications
This laboratory course is designed to provide hands-on experience to supplement the learning of the course TE3204.

TE 3804 Analog and Digital Communications Laboratory 1(0-3)
Recommended prerequisite or co-requisite:
TE 3103 Analog and Digital Communications
This laboratory course is designed to provide hands-on experience to supplement the learning of the course TE3103 Analog and Digital Communications.

TE 3901 Engineering Training 0(0-40)
The students are required to receive training in telecommunications engineering from a public-or private-sector establishment in order to enhance their engineering skill. The equivalence of 40 hours/week fulltime job not less than 300 hours.

TE 3902 Junior Project 1(0-3)
A preliminary investigation of a topic to be formulated as senior project. At the end of this course, an overview and general plan to carry out the implementation of the proposed project should be clearly presented.

TE 4401 Radio Wave Propagation and Wireless Communications 3(3-0)
Recommended prerequisite:
TE 3001 Electromagnetic Fields and Waves
Ground wave propagation, sky wave propagation, space wave propagation in the troposphere, tropospheric scattering propagation, microwave radio relay systems satellite and space communications, radar, propagation into seawater, atmospheric ducts, and non-standard refraction, study of some examples of modern wireless communication systems from an engineering perspective.

TE 4402 Antenna Engineering 3(2-3)
Recommended prerequisite:
TE 3001 Electromagnetic Fields and Waves
Basic definitions and theorems, formulation of the radiation problems, isotropic point source, power and field patterns, directivity and gain, radiation impedance, wave polarization, radiation from current elements, radiation properties of linear wire antenna, linear array antenna, Uda-Yagi antenna, log-periodic antenna, aperture antenna.

TE 4403 Microwave Engineering 3(2-3)
Recommended prerequisite:
TE 3001 Electromagnetic Fields and Waves
Maxwell's equation and boundary conditions, transmission-line theory, s parameters, Smith charts, impedance matching, microwave transmission line and waveguides, microwave resonators and filters, microwave network analysis, power dividers and directional couplers, microwave measurement and applications.

TE 4404 Satellite Communications 3(3-0)
Recommended prerequisite:
TE 3101 Principles of Communications
Historical development of satellite communications, wireless transmission system for satellite communications, types of communication satellites, ground station, noise and disturbances in satellite communication systems, modulation techniques, antenna systems for communication satellites, satellite control system, high frequency amplifier and receiver for satellite communications, introduction to Global Positioning System.

TE 4405 Cellular Mobile Systems 3(3-0)
Recommended prerequisite:
TE3101 Principles of Communications
Historical background of mobile and cellular services: AMPS, NAMPS, TDMA, CDMA, GSM; new generations of services; technical aspects: cells, encoding and multiplexing; security, switching, roaming, wireless data; capacity of the systems; future systems.

TE 4501 Optical Communications 3(2-3)
Recommended prerequisite:
TE 3001 Electromagnetic Fields and Waves
Principle of photoelectric devices, photo detection, laser principle, types of lasers, laser modulation techniques, optical components (optical divider and combiner, coupler, and lens), cylindrical dielectric waveguide and propagating conditions, optical cable types, optical fiber production process, Erbium Doped Fiber Amplifier (EDFA), link budget and evaluation.

TE 4502 Wide Area Communications Network 3(2-3)**Senior Standing Required**

Evolution of information networks; various coding techniques; digital signal multiplexing in PDH and SDH types; digital signal repeating; signal system and protocol; fundamental protocol techniques; common signaling; digital switching network; Integrated Services Digital Network (ISDN); network with new services e.g. mobile communication network; new types of telephone network services; electronic mail system; telematics and intelligent network.

TE 4601 Data Communications and Networking 3(2-3)

Introduction to data communications and networks, layered network, OSI model, network architecture, point-to-point protocol and links, delay models in data networks, multi-access communication, routing in data networks, data flow control.

TE 4602 Multimedia Communications 3(3-0)**Senior Standing Required**

Overview of multimedia communications; basic concepts about sound, images and graphics; video and animation; data compression; source and entropy coding; compression standards; optical storage media; multimedia networking; multimedia communications applications.

TE 4603 Short-range Wireless Communications 3(3-0)**Senior Standing Required**

Bluetooth: definitions of the terms used in Bluetooth, Bluetooth Protocol Stack, Bluetooth Link Types, Bluetooth security, network connection establishment in Bluetooth; error correction in Bluetooth; network topology in Bluetooth, Bluetooth Usage Models; Wireless Local Area Network; WLAN equipment, WLAN topologies, WLAN technologies; high-rate WLAN standard, other WLAN standards, optical wireless communications; comparison with radio, latest developments, Infrared Data Association (IrDA) standards.

TE 4701 Telecommunications Network Management 3(3-0)**Senior Standing Required**

Engineering and technical aspects of management for a telecommunications network: problems of serviceability, reliability, quality of service, etc. business aspect of management: forecast of future demand and future investment, technology trend, competitiveness.

TE 4702 Selected Topic in Telecommunications 3(3-0)**Senior Standing Required**

This course provides the opportunity for the students to learn about the latest development in the technologies of telecommunications. A combination of guided self study and interactive /cooperative learning environment is used. Students are required to take active participation in the acquisition and sharing of knowledge. Students will be assessed based on their participation as well as on the result of learning.

TE 4703 Advanced Telecommunication Networks 3(3-0)**Recommended prerequisite:**

CS 2300 Data Communication and Networking

Design; analyze and evaluation performance; Transmission aspects of voice telephony; digital networks signaling; CCITT signaling system no.7; frame relay; Asynchronous Transfer Mode (ATM); SONET/SDH. Local area network interconnection; wide area network (WAN).

TE 4704 Telecommunication Network Management and Design 3(3-0)**Recommended prerequisite:**

CS 2300 Data Communication and Networking

Basic network concepts. Generalized tools for system analysis and design. Analysis and design tools for voice and data networks. Network modeling and design techniques using analytical and computer tools with emphasis on hand-on experience (using software package). Network modeling and design process for integrated voice/data broadband networks and backbone networks. Technical aspects of management for a telecommunication network. Problems of serviceability, reliability and quality of services, etc. Business aspect of management: forecast of future demand and future investment, technology trend, competitiveness.

TE 4801 Radio and Transmission Lines Laboratory 1(0-3)**Recommended prerequisite or co-requisite:**

TE 3102 Telecommunications Networks and Transmission Lines,

TE 4401 Radio Wave Propagation and Wireless Communications

This laboratory course is designed to provide hands-on experience to supplement the learning of courses TE 3102 and TE 4401.

TE 4901 Project I 2(0-6)**Senior Standing Required**

Part I of a two-part project assignment in which the student as an individual or part of a small group is to carry out an investigative study on an approved topic in or closely related to the field of telecommunications engineering under the supervision of (an) instructor(s). A progress report at the completion of the course is required.

TE 4902 Project II **2(0-6)**
Recommended prerequisite: TE 4901 Project I
 Part II of a two-part project assignment in which the student as an individual or part of a small group is to carry out an investigative study on an approved topic in or closely related to the field of telecommunications engineering under the supervision of (an) instructor(s). A final report at the completion of the course and an oral examination by a committee are required.

Management Technology Program

BE 1001 Fine Arts and Science **3(2-3)**
Integration

This course encourages students to develop the fundamental of design by using their imagination to create two, round relief, and three dimension work of arts. With real practice, true understanding about how to combine various techniques such as composition, rhythm, proportion, light and shadow, etc. into the design will be enhanced. The focus is also on scientific evaluation to achieve the outcome that composts of arts and science. Students can apply this knowledge into their further works that require aesthetic aspects.

BE 1004 Sketching and Graphic **3(2-3)**
Presentation

This course encourages students to develop their skills in interpretative sketching, free-hand drawing, and graphic presentation. It will involve intensive hands-on exercises, supported by group discussion, review and short lectures. Students can apply this knowledge into their further works that require aesthetic aspects such as their architectural and environmental design courses. Exercises will be carried out first in the studio room, and then on pre-selected locales of different kinds. A series of assessable drawings will be produced by each student, using a range of media - including pencil, ink-pen, charcoal-pencil, color pen and pencil, on sketchbooks and white or colored A4 - A3 sized paper.

BE 2001 Architectural Theory and **3(3-0)**
Philosophy I

The course emphasizes on the studies of concepts and theories of architectural design in the past. Factors that influence the style of architecture; the development of architecture during the Industrial Revolution that leads to the realization of Modern Architecture; the works by Masters of Modernism such as Frank Lloyd Wright, Le Corbusier and Mies Van Der Rohe. Modern Architecture in Russia and the world-wide influences of Modernism on architecture.

BE 2101 Architectural and **3(1-6)**
Environmental Design I
Recommended prerequisite:

BE 1001 Fine Arts and Science
 Integration

Students will be assigned to create small size of architecture and integrate together design theories, creativity, and scientific reasons. The focus is on mutual learning between students and instructors as well as learning by doing. This will prepare students to be capable of creating advanced design. One field trip to design related site will be included as a case study.

BE 2102 Architectural and **3(1-6)**
Environmental Design II
Recommended prerequisite:

BE 2101 Architectural and
 Environmental Design I

This is the continual and more complicated practice from the pressure quest course. Applying research and scientific rationale into architectural work, the focus is on taking advantage of natural assets including light, ventilation, and heat radiation, to create comfort condition, and to prepare students for upper design level. One field trip to design related site will be included as a case study.

BE 2301 Structures I **3(3-0)**

Basic analysis of structure to be implemented in architecture will be studied including the principles of momentum, shear, and deflection. Students are expected to be able to estimate proper size of building structure for various architectural components such as basement, post, beam, etc., and to select a suitable form of structure for the building.

BE 2303 Building Materials and **3(2-3)**
Construction I

Natural construction materials such as sand, stone, brick, wood, metal and manufactured materials like glass, plastic, metal compounds will be studied to the fundamental chemical components to enable proper application in design and on site. In addition to lectures, students will have opportunities to learn and practice the basic skills of construction drawing by completing assignments.

BE 2601 Building Systems and **3(3-0)**
Integration I

Building systems including sanitary system, water supply system, fire extinguish system, drainage, waste water treatment, electrical system, fire protection system, vertical transportation (elevator and escalator), and security system. Building automation system will also be introduced. The clearer picture of how to efficiently apply these systems together with the architecture will prepare students for further capability to integrate other systems into their works.

BE 3103 Architectural and Environmental Design III 3(1-6)**Recommended prerequisite:****BE 2102** Architectural and Environmental Design II

The design of more complicated architectural work is explored with more consideration on scientific and research support. Taking full advantage of nature, and finding out probable limitation is also main interest in this course in order that problems from heat, moisture, noise, and direct sun can be prevented. One field trip to design related site will be included as a case study.

BE 3104 Architectural and Environmental Design IV 3(1-6)**Recommended prerequisite:****BE 3103** Architectural and Environmental Design III

Students will learn how to integrate all of the following in to the design: advanced design theories and philosophy, aesthetics, function, good quality of life, and energy conservation within the building. In this design step, there have to be scientific and research support with additional study on modern technology and Thai wisdom applied into the design properly. One field trip to design related site will be included as a case study.

BE 3105 Extended Architectural and Environmental Design III 3(2-3)**Recommended Co-requisite:****BE 3103** Architectural and Environmental Design III

The course, which is an extension of BE3103, accommodates students who need to increase their practices on Architectural and Environmental Design III. The course emphasizes on the design of more complicated architectural work with consideration on scientific and research support. Taking full advantage of nature, and finding out probable limitation is also main interest in the course in order that problems from heat, moisture, noise, and direct sun can be prevented.

BE 3106 Extended Architectural and Environmental Design IV 3(2-3)**Recommended Co-requisite:****BE 3104** Architectural and Environmental Design IV

The course, which is an extension of BE3104, accommodates students who need to increase their practices on Architectural and Environmental Design IV. Students will learn how to integrate all of the following in to the design: advanced design theories and philosophy, aesthetics, function, good quality of life, and energy conservation within the building. In this design step, there have to be scientific and research support with additional study on modern technology and Thai wisdom applied into the design properly.

BE 3602 Building Systems and Integration II 3(3-0)

Students will be educated in more advanced building systems and add more complicate system such as building structure, air-conditioning system, building control system, to apply with other systems and create better-integrated design. This module also introduces the building service methods, principally air condition and other ducted air systems, and discuss the resorting to avoid A/C and the consequent design issues.

BE 4105 Integrated Architectural and Environmental Design I 3(1-6)**Recommended prerequisite:****BE 3104** Architectural and Environmental Design IV

This course enables students to understand highly complicated architectural design that combines all of the following together: design philosophies, technologies, local wisdom, function, and true understanding of building systems and structure. Students will be prepared to create architectural works with combination of multi-disciplinary such as aesthetic, science, humanity, economic, etc. Various simulation tools such as computer simulation, field research, etc are integrated into the course. One field trip to design related site will be included as a case study.

BE 4201 Energy and Environmental Technology I 3(2-3)

The course enables students to properly learn from research conducting sharing experience with their instructors. The lecture provides understanding of indoor comfort condition, design in tropical climate, heat and moisture protection, micro-climate modification, insulation, mass, natural ventilation, and earth shelter. Also, the students are well grounded in this skill by being trained to implement research into the design that will be beneficial in their future career and education. For practice section, searching for new science and understanding of basic research conduction will be explored to prepare students for further research doing.

BE 4202 Energy and Environmental Technology II 3(2-3)

This course emphasizes on design theories including the use of natural lighting and indoor acoustical control. Acoustics, considers the behavior of sound in and around buildings by covering: sound propagation, room acoustic, sound insulation, ventilation noise, elementary vibration control measures. Simple methods for predicting acoustical behavior are discussed and practical design solutions are presented. Lighting, deals with the principles of lighting and the lighting design process for building. It covers: point line and light sources, type and properties of luminaries, polar curves, design methods, and calculations, glare index, luminaire heat influence and lighting energy measurement.

BE 4503 Feng Sui and Science in Architecture 3(3-0)

Feng sui is the study of the way in which our environments affect every aspect of our lives. The selection of a property site and the placement of buildings on a property, of rooms within a building and of furniture within a room influence us, sometimes in obvious ways, often in very subtle ways. The goal in this course is to give students a foundation in the history and concepts of environmental science in Feng sui that will lead to the practical application of Feng sui. This course will explore the origins and principles of this ancient Chinese discipline and analyze how this Eastern philosophy is applicable in scientific approach.

BE 4701 Building Energy and Cost Estimation 3(3-0)

Understanding of building construction economics, estimation of building construction, basic financial management, the reduction of building construction cost, evaluated building renovation schemes, and evaluate the energy conservation concepts which base on reason of building construction cost and developing cost.

BE 4703 Computer Graphics and Multimedia 3(3-0)

Offers an introduction to computer graphics, which has become an increasingly important area within computer science. Computer graphics, particularly in association with the multimedia aspects of the World-Wide Web, have opened up exciting new possibilities for the design of human-computer interfaces. The purpose of this course is to investigate the principles, techniques, and tools that have enabled these advances. Topics includes: graphics systems; video display devices, hierarchy of graphics software; using a graphics API; simple color models; homogeneous coordinates; affine transformations; viewing transformation; clipping; HCI aspects of interface design; Graphical user-interface design and programming; computer animation, multimedia techniques : sound, video and graphics design of multimedia systems, tools for multimedia development; virtual reality.

BE 4704 Advanced Computer Graphics & Multimedia 3(3-0)

This course enables students to deepen their knowledge of widely used software applications that are able to support the architectural design process. Topics include: overview of so called CAAD (Computer Aided Architectural Design) modules, insight and practice of applications for 3D modeling and visualization, pictures processing, as well as vector-based illustrations, editing and publishing. Assignments on selected topics will guide the students through out the course and prepare them to apply and integrate their knowledge in the final project.

BE 4901 Introduction to Environmental and Urban Planning 3(3-0)

The course aims to depict city evolution including influential factors that affect the physical development namely economics, social structure, and city and regional environment. The course aims also to study the relationships between a city and its peripheries that lead to effective development plans. It covers the process of urban and regional planning including concepts and scope of works, land-use policy, urban conservation and rehabilitation, as well as the studies on the formation of new towns.

BE 4912 Environmental Impact Assessment (EIA) 3(3-0)

This course explores interactions between human activities and natural or man-made ecosystems, linking them to the concept of environmental sustainability and to Environmental Impact Assessment (EIA) procedures. It focuses both on strategic and project level, and discusses examples of EIA systems used in different countries. Special regard, however, is on the explanation about the system, institutional framework, and regulations of EIA operation in Thailand.

MT 1601 Introduction to Biotechnology 3(3-0)

Development of biotechnology: fermentation, animal and plant breeding, the cellular and molecular biological functions of modern biotechnology. Impact of biotechnology on agriculture, medicine and the environment. At least one field trip will be organized.

MT 1602 General Food Science 3(3-0)

A study of the physical, chemical and microbiological aspects of foods, the function of and changes in components during preparation and processing of foods. At least one field trip to the food industries will be organized.

MT 1603 Biochemistry 3(3-0)

Basic principles of biochemistry and molecular biology, chemical events in living systems in terms of metabolism and structure-function relationships of biologically important molecules.

MT 1604 Human Nutrition 3(3-0)

Structure, properties and sources of nutrients; role of nutrients in human structure and function. Introduction to food groups; nutrition in health and disease; nutritional needs of vulnerable groups such as infants, pregnant and lactating women, the aged; dietary intolerance, disorders related to the affluent diet including coronary heart disease, dental caries, diabetes, hypertension and cancer; problems of under nutrition including protein, energy, mineral and vitamin deficiencies; physiological and nutritional aspects of dietary fibre, alcohol; assessment of nutritional status using dietary and anthropometric techniques.

MT 2001 Basic Electrical Engineering 3(3-0)
Basic circuit theory, DC and AC circuit analysis, Kirchhoff's law, Thevenin theorem, three-phase circuits. Basic electronic devices and circuits. Fundamentals of power systems, DC and AC motors and generators. Transformers, Electrical wirings in buildings and industries.

MT 2002 Materials Science 3(3-0)
Introduction to traditional structural materials including metals, alloys, ceramics, woods, polymers and composites, and functional materials including semiconductors, super conductors, magnetic materials, and smart materials. Microstructures in relationship with mechanical/electrical properties of materials. Failure analysis and degradation of properties.

MT 2601 Unit Operations in Food Processing 3(3-0)
Process of unit operation, its applications, effects on the food product and requirements, appropriate process diagrams, mass and heat balances and flows, solving unit operation problems. Unit operations covered are refrigeration, dehydration, evaporation, extrusion.

MT 2602 Health Food and Herbal Medicine 3(3-0)
Recommended prerequisite:

GE 1207 Integrated Approach to Science and Technology

This course begins with the definitions and scope of health food and herbal medicine. An overview of their history, popular items, properties and scientific merits versus junk food and modern drugs will be given. The manufacturing concerns, including selecting products and production methods, establishing production facilities, good manufacturing practice, managing production and quality assurance, will be focused.

MT 2603 Food Choice: Psychology, Preference and Acceptability 3(3-0)
Consideration of factors that influence the choice of foods and eating patterns by consumers, and provides a rational basis for the design, development and marketing of new food products and new processing technologies.

MT 2604 Food Preservation: Principles and Applications 3(3-0)
Traditional and novel methods of preserving foods for distribution and storage. Technologies covered are heating, chilling, freezing, drying, brining, pickling, sugar, radiation, packaging, chemical preservatives and novel methods.

MT 2605 Sensory Evaluation of Foods 3(3-0)
The role of sensory evaluation in marketing of food and beverages, physiological and psychological factors affecting sensory perception, relationships between sensory properties and product acceptability, measurement of sensory perception, design and conduct of sensory evaluation experiment. A range of food and beverage products will be assessed using the techniques and principles present in the lecture program.

MT 2606 Food Safety & Quality Management 3(3-0)
The principles of quality assurance, management and total quality management, HACCP (hazard analysis of critical control points) system implementation. Traceability. International and national food regulatory systems and the development of, and scientific basis for, food regulations.

MT 3004 Engineering Economy 3(3-0)
Introduction to engineering economy. Cost concepts and design economics. Time value of money. Net present worth, return on investment, payback period and benefit-cost ratio, Depreciation and taxes. Decision making and evaluation of investment alternatives. Risk and uncertainty in economic analysis. Decisions involving multiple criteria.

MT 3005 Thermo Fluids 3(3-0)
Recommended prerequisite: **GE 1205** Physical Science

Concepts of thermodynamic system states processes, heat and work. First law of thermodynamics. Momentum and energy equation. Second law of thermodynamics, reversibility and entropy. Fluid flows in pipes. Modes of heat transfer and engineering heat transfer equations. Pumps and fans.

MT 3301 Industrial Plant Design 3(3-0)
Modern planning methods for facility layout and location design. Machine requirement and location analyses, logistics and motion of people and materials. Materials handling techniques. Storage and warehousing design. Line balancing and physical distribution. Introduction to commercial computer packages for industrial plant design.

MT 3302 Production Planning and Control 3(3-0)
Introduction to the concept of integrated production planning and control systems. Considerations of material, equipment, and manpower requirements for optimizing continuous and intermittent manufacturing operations. Demand forecasting and production development planning. Operation sequencing and scheduling. Capacity planning and line balancing.

MT 3303 Total Quality Assurance 3(3-0)
Fundamentals of quality control and concepts of total quality management. Sampling technique and statistical process control. Methods for defect prevention and product inspection. Process capability measures and analysis ISO9000 quality standard.

MT 3304 Operations Research 3(3-0)
Basic operations research models, algorithms and their applications are discussed in this course. Topics covered are linear programming and its extensions; transportation model; game theory; network flow analysis; queuing theory; and simulation modeling.

MT 3305 Applied Statistical Methods 3(3-0)
This course emphasizes statistical analysis techniques and their applications. Topics discussed include a review of hypothesis testing goodness-of-fit tests, regression analysis, and analysis of variance. Special attention is given to their applications in engineering fields.

MT 3306 Systems Simulation 3(3-0)
This course introduces the application of discrete time simulation modeling for the analysis of complex manufacturing and service systems, using case examples in warehousing, material handling, banking, etc. Applications of continuous time and combines discrete-continuous simulation modeling will also be illustrated. Students will gain first-hand practice on how to use state-of-the-art simulation software through a series of laboratory exercises or a realistic semester project.

MT 3307 Logistics and Supply Chain Management 3(3-0)
Principles of logistics and supply chain management. Logistics planning and strategy. Management and cooperation in supply chain; transportation; procurement; inventory control; packaging; production planning and distribution. Roles of information technology in supply chain management. Example studies on their applications to some selected industries and organizations.

MT 3308 Industrial Cost Analysis and Control 3(3-0)
Concept and classification of cost. Standard costing. Cost allocation and estimation. Cost-volume-profit relationships. Financial analysis of accounting system. Utilization of accounting data for control of operations.

MT 3309 Maintenance Management 3(3-0)
Concepts and utilizations of maintenance applied to equipment and facilities for industrial systems and commercial buildings. Safety and productivity aspects of maintenance. Reliability of system components. Preventive and emergency maintenance. Planning and scheduling of maintenance activities.

MT 3501 Social Aspects of Environment Management 3(3-0)
Analysis of social factors affecting environmental problems such as urbanization, industrialization, globalization, technological progress; strategies and remedial measures to solve the problems at both macro - and micro-scales; roles of government and non-government organizations on environmental management.

MT 3502 Pollution Prevention 3(3-0)
Concepts of waste minimization and pollution prevention and their implementations in various industries, commercial and residential sectors, urban areas and service sectors. Total quality environmental management. Waste recycling and exchanges. Elements of international standards ISO14000.

MT 3601 Food Analysis 3(3-0)
The course describes theoretical and practical aspects of food analysis which include preparation of samples; determination of chemical composition; reliability of analysis; instrumentation in food analysis; analysis of food spectroscopic methods, electrochemical methods, immunological methods, molecular methods and bio-analytical methods and laboratory on visible spectroscopy and off-campus visits to food-analysis laboratory.

MT 4003 Project Feasibility Study 3(3-0)
Fundamental concepts of a project feasibility study is discussed in detail. The course emphasizes essential qualitative and quantitative aspects of the feasibility study such as marketing evaluation, proposal development (preparation and presentation), economic analysis, project planning and scheduling, etc.

MT 4004 Management Technology Training 0(0-40)
Students are provided with on-the-job training at selected industrial or service organizations. The purposes of this course are to allow the students opportunities to learn through hands-on experience how various modern technologies can be applied to manage facilities and systems. Moreover, students will learn how to collaborate with co-workers, coordinate project activities, and develop self-responsibility. The training period must not less than 300 hours. Students must submit a written report at the end of the training period. Satisfactory (S) or unsatisfactory (U) grade will be given based on the student's performance, the quality of the report, and the supervisor's comments.

MT 4005 Senior Project 3(0-9)
Students are required to propose their projects during the first semester of their senior year. Students are responsible for presenting and submitting their final reports before the end of the second semester.

Map

Shinawatra University





SIU

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