

# Master of Science Program in Engineering and Technology (International Program)

## Curriculum Title

Master of Science in Engineering and Technology (International Program)

## Degree Title

Master of Science (Engineering and Technology)

## Applicants' Qualifications

1. The applicant must hold a bachelor's degree in engineering, science or a related field that is accepted by SIIT Academic Committee and must have a top 20% class rank for a Bachelor's Degree, or a cumulative GPA of at least 2.75 or 2.50 with sufficient relevant research or work experience as specified by SIIT Academic Committee.
2. Two letters of recommendation.
3. The applicant must submit an English score of one of the following English language tests:
  - TOEFL score of not less than 400 (paper-based) or 97 (computer-based), or 32 (internet-based).
  - IELTS score of not less than 4.5
  - TU-GET score of not less than 400

The score must not be older than two years, from the date on which it was issued, to the date of the application for admission to the program.

4. Approval of the admission by the SIIT Academic Committee.

After admission, the student must achieve one of the following English scores by the end of their first year. If the student cannot pass this English score, the status of the student will be terminated.

- TOEFL score of not less than 500 (paper-based) or 173 (computer-based), or 61 (internet-based).
- IELTS score of not less than 5.5
- TU-GET score of not less than 500

## Admission Requirements

1. The applicant must pass a selection interview conducted by an SIIT Committee consisting of at least 3 faculty members.
2. Admission to the program requires approval by the SIIT Academic Committee.

Remark: Students who have inadequate knowledge in some areas, may be required to take additional courses in those areas.

## Academic System

1. All courses are conducted in English. An academic year is divided into 2 semesters. Each semester consists of 15 weeks. Courses may be offered for a summer semester of at least 8 weeks duration. The total number of lecture hours required for the summer semester is the same as that for the regular semester. Enrollment for summer courses is optional.

2. Curriculum

### 2.1 Study Plan

The syllabus consists of prescribed coursework (12 credits) and thesis (27 credits). A total of 39 credits are required for completion of the program.

### 2.2 Thesis

- 2.2.1 A student can register for a thesis after he or she has studied for at least 1 regular semester or has gained 12 credits with a minimum cumulative GPA of 3.00.

### 2.2.2 Thesis Committee

The Thesis Committee consists of a) a faculty member of SIIT who is the student's advisor, b) two or more members, at least one of whom is a faculty member of SIIT, and c) a co-advisor (if needed) with a doctoral degree or equivalent, or an academic rank of at least associate professor. There must be at least one member who is not affiliated with Thammasat University. The advisor and co-advisor must not be the chairperson of the Thesis Committee. The number of the committee members who are not the thesis advisor or co-advisor must not be less than the number of the thesis advisor and co-advisor. The number of Thesis Committee members who are faculty members of SIIT should not be smaller than that of the Thesis Committee members from outside.

### 2.2.3 Thesis Final Defense Committee

The Thesis Final Defense Committee consists of the same members as the Thesis Committee. However, the defense must be chaired by a thesis committee member who is not the advisor or co-advisor.

### 2.2.4 External Examiner

The external examiner must be appointed by the SIIT Academic Committee.

## Period of Study

The maximum period of study to complete the program is 4 academic years.

## Registration

The student must enroll in courses and/or register for a thesis totalling at least 6 credits but not more than 15 credits per semester for a regular semester and not more than 6 credits for a summer semester.

## Academic Performance Evaluation and Graduation

### 1. Evaluation of Academic Performance

- 1.1 A credit will be earned only if the grade is "S" or not lower than grade "C". Grade "D" or "F" will be included in the calculation of the grade point average of each semester and for the cumulative grade point average.
- 1.2 Any student, who gets grade "U", "D" or "F" in a compulsory course, can re-enroll in that course only one more time. His or her student status will be terminated if he or she still fails to obtain grade "S" or at least "C" for the course in the second enrollment.
- 1.3 Thesis assessment is graded as follows:
  - S (Satisfactory)
  - U (Unsatisfactory).Students must get grade "S" for their theses.
- 1.4 Additional course assessment and English proficiency requirements are graded as follows:
  - P (Pass)
  - N (Not Pass).

### 2. Graduation Requirements

To graduate, students must meet the following minimum requirements:

- 2.1 Twelve credits of courses (see the course descriptions) with a GPA of at least 3.00 or equivalent.
- 2.2 Twenty seven credits of thesis with grade "S".
- 2.3 At least one paper on thesis results must have been accepted for publication in a reputable international journal approved by the Academic Review Committee. The following alternate requirements may be used: one national journal paper (accepted) and one national conference paper in proceedings (accepted), or one international conference proceedings paper (accepted and registered for presentation) and one international conference proceedings paper (submitted).
- 2.4 Approval of the thesis by Thesis Committee, and passing a thesis defense.
- 2.5 Satisfying one of the following English proficiency requirements: TOEFL (official or institutional) not less than 550 (or 213 for computer-based test or 79 for Internet-based test), or IELTS not less than 6.0, or TU-GET with a score of at least 550.

## Transferred Credits

Nine credits (maximum) of courses with all grades B or better, can be transferred.

## Curriculum

### 1. Total credits requirement

A total of 39 credits is required for completion of the program.

### 2. Structure and Components

2.1 Compulsory Courses	6 Credits
2.2 Compulsory Elective Course	3 Credits
2.3 Elective Course	3 Credits
2.4 Master's Thesis	27 Credits
<b>Total</b>	<b>39 Credits</b>

### 3. Course Coding System

Sirindhorn International Institute of Technology sets up the courses as follows:

3.1 Subject code consists of letters and numbers.

3.2 ES indicates basic subjects.

ET indicates subjects in Engineering Technology Program.

ICT indicates subjects in Information and Communication Technology for Embedded Systems.

SE indicates subjects in Supply Chain System Engineering and Logistics Program.

3.3 Numbers are composed of 3 digits.

- The first unit-place-digit indicates the subject order.
- The tenth-place-digit indicates the subject group.
- The hundredth-place-digit indicates the graduate program.

### 4. List of courses in the curriculum

#### 4.1 Compulsory Courses, 6 credits

Code	Course Title	Credits (lecture-practice-self study hrs)
ES803	Special Study	3(3-0-9)
ES805	Research Methodology	2(2-0-6)
ES806	Research Seminar	1(0-3-1)

#### 4.2 Compulsory Elective Course, 3 credits

Code	Course Title	Credits (lecture-practice-self study hrs)
ES801	Advanced Engineering Mathematics	3(3-0-9)
or ES811	Theory of Computation	3(3-0-9)
or ES812	Advanced Business Statistics	3(3-0-9)
or ET600	Numerical Methods for Engineers	3(3-0-9)
or ICT600	Computational Mathematics	3(3-0-9)
or SE600	Decision Making and Optimization	3(3-0-9)

#### 4.3 Elective Course, 3 credits

Code	Course Title	Credits (lecture-practice-self study hrs)
ES804	Selected Topic	3(3-0-9)

#### 4.4 Master's Thesis, 27 credits

Code	Course Title	Credits (lecture-practice-self study hrs)
ES800	Master's Thesis	27

## Course Descriptions

### Compulsory Courses

**ES803 Special Study** **3(3-0-9)**

Each student is required to undertake an in-depth study of an approved topic which will lead to formulation of thesis proposal. The study will be supervised by a faculty member. A written report and oral presentation have to be given at the end of the semester to the student's thesis committee.

**ES805 Research Methodology** **2(2-0-6)**

Concept of scientific and technological research; statistics for research planning and research study; data collection and data analysis; interpretations, conclusions and recommendations of research results.

**ES806 Research Seminar** **1(0-3-1)**

Student-faculty interaction on advanced research topics.

### Compulsory Elective Courses

**ES801 Advanced Engineering Mathematics** **3(3-0-9)**

Mathematics for solving engineering problems; ordinary differential equations of higher order; partial differential equations; integral equations; numerical analysis; optimization techniques.

**ES811 Theory of Computation** **3(3-0-9)**

Set theory; relations; formal proof methods; finite automata; regular expressions; context-free grammar; pushdown automata; Turing machines; uncomputability; computational complexity; first-order logic.

**ES812 Advanced Business Statistics** **3(3-0-9)**

This course exposes students to the application of statistical techniques used to address business and economic problems. Topics include linear regression and correlation, multiple regression, model building, analysis of variance, multivariate statistics, time series analysis, and chi-square test of significance.

**ET600 Numerical Methods for Engineers** **3(3-0-9)**

Programming concepts and techniques; Modern programming languages and computational tools for engineering problems; Numerical methods as applied to practical engineering problems; Introduction to finite element methods.

**ICT600 Computational Mathematics** **3(3-0-9)**

Set theory; relations; Formal proof methods; Finite automata; Regular expressions; Context-free grammar; Pushdown automata; First order logic; Theories related to counting, graphs and networks; Interplay between continuous models and their solution via discrete processes; Vector spaces, basis, dimension, eigenvalue problems, diagonalization, inner products, unitary matrices; Introduction to applied statistics and its application to intelligent systems; introduction to supervised statistical learning including discrimination methods.

**SE600 Decision Making and Optimization** **3(3-0-9)**

Fundamental optimization tools for quantitative analysis to develop modeling and decision-making skill in management sciences; Linear programming; Integer programming; Nonlinear programming; Goal programming; Game theory; Markov chains; Queuing theory and decision analysis techniques; Advanced topics in optimization.

### Elective Course

**ES804 Selected Topic** **3(3-0-9)**

The student may select, by consultation with the student's thesis advisor, to undertake a course or an in-depth study of an approval topic which is relevant to the student's thesis. For the latter case, a written report and oral presentation have to be given at the end of the semester to the student's thesis committee. The course/the topic of the in-depth study has to be approved by the student's thesis committee.

### Master's Thesis

**ES800 Master's Thesis** **27 Credits**

This course guides students how to develop and carry out master research in the field of engineering and technology: Thesis writing, thesis presentation, publication, and research ethics.