Master of Engineering in Logistics and Supply Chain Systems Engineering (LSCSE) (International Program)

Curriculum Title

Master of Engineering in Logistics and Supply Chain Systems Engineering (LSCSE) (International Program)

Degree Title

Master of Engineering (Logistics and Supply Chain Systems Engineering)

Applicants' Qualifications

1. The applicant must hold a bachelor's degree in engineering, science or a related field that is accepted by the SIIT Executive Committee.
2. The applicant must have a cumulative GPA of at least 2.75 or sufficient relevant research or work experience as specified by the SIIT Executive Committee.
3. The applicant must submit an official score of one of the following English language tests:
   - TU-GET,
   - TOEFL (official or institutional),
   - IELTS, or
   - an English test conducted by SIIT.

   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.

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 Executive 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 16 weeks. Courses may be offered for a summer semester of at least 6 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 (24 credits) and thesis (15 credits). A total of 39 credits is 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 2 regular semesters or has gained 12 credits with a minimum cumulative GPA of 3.00.

   2.2.2 Thesis Committee

   The Thesis Committee consists of the thesis advisor, who is a faculty member of SIIT, as the chairperson, the thesis co-advisor (if appointed), and one or more members. There must be at least one member who is not affiliated with SIIT. The total number of the committee members who are not the thesis advisor or co-advisor must not be less than the total number of the thesis advisor and co-advisor. In addition, the number of committee members from SIIT must not be less

than the number of external committee members. The Thesis Committee is appointed by the SIIT Executive Committee.

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 Executive 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 totaling at least 6 credits but not more than 12 credits per 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 taught 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 classified into 2 grades:
   - S (Satisfactory)
   - U (Unsatisfactory).

   Students must get grade “S” for their theses.

2. Graduation Requirements

   To graduate, students must meet the following minimum requirements:

   2.1 Twenty-four credits of taught courses required by the curriculum with an accumulative GPA of at least 3.00. In addition, the grade of each of these courses must be at least “C”.

   2.2 Fifteen credits of thesis work and passing a thesis defense.

   2.3 Approval of the thesis by the external examiner and the thesis committee.

   2.4 At least one paper on thesis findings has been accepted for publication in a national journal approved by the Academic Review Committee of SIIT, or at least two papers have been accepted for publication in international conference proceedings.

   2.5 Have satisfied one of the following English proficiency requirements:
   - A TOEFL (official or institutional) score of at least 550 (paper-based), or 213 (computer-based), or 79 (internet-based), or
   - An IELTS score of at least 6.0, or
   - A TU-GET score of at least 550.

Curriculum

1. Total credits requirement

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

2. Structure and Components

2.1 Core Courses		24 Credits
2.1.1	Compulsory Courses	12 Credits
2.1.2	Technical Elective Courses	12 Credits
2.2 Master's Thesis		15 Credits
	Total	**39 Credits**

3. Course Coding System

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

3.1 Subject code consists of letters and numbers.

3.2 ICT indicates subjects in Information and Communication Technology for Embedded Systems.
SE indicates subjects in Supply Chain System Engineering and Logistics Program.
ET indicates subjects in Engineering Technology Program.
ES indicates basic subjects.

3.3 Numbers are composed of 3 digits.
- The first unit-place-digit indicates the order of subject.
- 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 Core Courses, 24 credits

4.1.1 Compulsory Courses, 12 credits

Code	Course Title	Credits (lecture-practice-self study hrs)
SE600	Decision Making and Optimization	3(3-0-9)
or		
ET600	Numerical Methods for Engineers	3(3-0-9)
or		
ICT600	Computational Mathematics	3(3-0-9)
SE601	Logistics and Supply Chain Systems	3(3-0-9)
SE602	Production Logistics	3(3-0-9)
ES805	Research Methodology	2(2-0-6)
ES806	Research Seminar	1(0-3-1)

4.1.2 Technical Elective Courses, 12 credits

Code	Course Title	Credits (lecture-practice-self study hrs)
SE61x	Technical Elective*	3(3-0-9)
SE61x	Technical Elective*	3(3-0-9)
SE61x	Technical Elective*	3(3-0-9)
SE61x	Technical Elective*	3(3-0-9)

* List of Technical Electives: select 4 courses (12 credits) from the following courses:

SE610	Simulation Modeling and Analysis in Supply Chain	3(3-0-9)
SE611	Procurement Logistics	3(3-0-9)
SE612	Laws and Regulations in Logistics	3(3-0-9)
SE613	Transportation Systems Design and Analysis	3(3-0-9)
SE614	Warehouse Design and Operations	3(3-0-9)
SE615	Operations Scheduling	3(3-0-9)
SE616	Design of Experiments in Supply Chain Systems	3(3-0-9)
SE617	Accounting and Financial Management for Logistics and Supply Chain Systems	3(3-0-9)
SE618	Special Topic in Logistics and Supply Chain Systems	3(3-0-9)
SE619	Current Topics in Logistics and Supply Chain Systems	3(3-0-9)

4.2 Master's Thesis

Code	Course Title	Credits
SE800	Master's Thesis	15

Course Descriptions

Compulsory Courses

ES805 Research Methodology 2(3-0-6)
Concepts 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.

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.

SE601 Logistics and Supply Chain Systems 3(3-0-9)
Principle of domestic and international logistics and supply chain systems, logistics, transportation, production planning, inventory control, purchasing and procurement, packaging, supply chain integration; Information technologies and management information system/development and analysis, model-based, data-based, and knowledge-based systems and knowledge engineering; Newly emerging technologies in supply chain systems such as radio frequency identification (RFID); Global supply chain models, government intervention and regulations, international transportation and risk analysis.

SE602 Production Logistics 3(3-0-9)
Design, analysis and implementation of enterprise-wide resource and production planning and control systems; Demand forecasting, aggregate planning; Decision support models for production planning; Master scheduling; Shop floor control; Inventory control and policy; Maintenance and reliability in engineering systems; Application of information technologies such as ERP and MRPII to production and operations planning and control.

SE800 Master's Thesis 15 credits
Students will conduct research studies in the area of logistics and supply chain systems engineering under the supervision of their thesis advisor. Research areas include production logistics analysis (production planning, inventory control, maintenance, reliability, scheduling specifically for and limited to logistics and supply chain systems), procurement logistics analysis (e-procurement, outsourcing, multiple sourcing), distribution center and warehouse system analysis, transportation systems design and analysis specifically for logistics and supply chain systems. Research output must lead to publication in international conference proceedings, or national/international refereed journal.

Technical Elective Courses

SE610 Simulation Modeling and Analysis in Supply Chain 3(3-0-9)
Understanding the role of modeling and simulation in the development and improvement of logistics and supply chain operations; Methodology and modeling; Conducting a simulation study; Hands-on exercise of a particular software package and its application in a practical context.

SE611 Procurement Logistics 3(3-0-9)
Overview of the procurement and purchasing activities in a supply chain; Supplier evaluation and selection; Pricing, negotiation, contracts; Outsourcing; Multiple sourcing; Just-in-time procurement; Inventory management; Buying decisions and plans; Cost analysis; Purchase agreements; E-procurement; Real-time internet-based e-supply chains; Reverse logistics and customer services; Supply chains for financing; Purchasing analysis of capital equipment; Institutional and government purchases.

SE612 Laws and Regulations in Logistics 3(3-0-9)
Logistics systems and legal framework for the domestic and international movement of goods; Operational characteristics of providers for exporting and importing services; Effects of government trade policies on global logistics.

SE613 Transportation Systems Design and Analysis 3(3-0-9)
Characteristics of various modes of domestic and international transportations; Vehicle types; Urban, air, ocean, highway, pick-up and delivery systems; Scheduling; Factors that influence transport demand; Costs; Market structures; Carrier pricing; Carrier operating and service characteristics and their influence on other supply chain costs and supply chain performance such as routes; labor; competition.

SE614 Warehouse Design and Operations 3(3-0-9)
Fundamental operations in warehousing including roles of warehousing, layout and facility design, warehouse technology such as bar codes, radio frequency identification (RFID) for inventory control systems, modern warehouse operations, classifying products, materials handling, racking and shelving, automated storage and retrieval systems (AS/RS), aisle width decision; Information technology for warehouse operations; Health and safety issues.

SE615 Operations Scheduling 3(3-0-9)
Sequencing and scheduling activities including: static and dynamic problems; deterministic and stochastic models, single machine processing; Parallel machine processing; Flow-shop and job-shop scheduling; Project scheduling; Workforce scheduling; Exact and heuristic solution methods and applications in logistics and supply chain systems.

SE616 Design of Experiments in Supply Chain Systems 3(3-0-9)
Fundamental of Design of Experiment; Simple experiment design, factorial, fractional factorial experiments; ANOVA analysis, model adequacy analysis, mixed level designs, response surface methodology and Taguchi design; Review of successful experimentation in Supply Chain Management practices.

SE617 Accounting and Financial Management for Logistics and Supply Chain Systems 3(3-0-9)
Profitability, liquidity; Analysis and interpretation of published financial statements; Cost behavior analysis; Profit, volume analyses; Budget preparation and control; Standard costing; Divisional, segmental performance measurement; Capital investment; Risk and uncertainty analysis; Effects of inflation and taxation; Introduction to computer based financial modeling; Good corporate governance.

SE618 Special Topic in Logistics and Supply Chain Systems 3(3-0-9)
Advanced topics in integrated logistics and supply chain operations; Procurement strategies and strategic sourcing; Dynamic pricing and revenue management tactics; Mitigation of supply chain risk through supply contracts; Risk analysis in global environment; Strategic outsourcing of supply chain functions and operations; Management and operation of third party logistics providers; Management of supply chain security.

SE619 Current Topics in Logistics and Supply Chain Systems 3(3-0-9)
A study on current interests in the field of logistics and supply chain systems and operations.