The Master of Science (M. Sc.) Program in Information Systems

The increasing use of computers and information systems in all sectors of the economy has created a huge demand for professionals working in that sector having a balanced combination of theoretical and practical knowledge of computers and information systems. Apart from the computer sector itself, all other sectors demand personnel qualified in computer and information technology applications with emphasis on their broader use in their respective fields. For most of these professionals the use of computers will merely be a means to an end. The objective of the intended graduate program will be to meet this demand by educating graduates of other disciplines in theoretical and practical aspects of computing and information systems so that they will be able to develop algorithmic, scientific and technological approaches to their practical problems. The program will be designed to accommodate past graduates who are currently working at various sectors by scheduling courses and practical work in late afternoon hours.

The current program of the Institute of Graduate Studies and Research is a course based (non-thesis) graduate program leading to the Master of Science (M.S.) degree in Information Systems. The general aim of this program is to provide a structured learning environment that will allow graduates of different disciplines develop their abilities in computer applications, acquire expertise in theoretical and practical aspects of computing.

Graduates of any discipline who are willing to acquire expertise in the field of computer applications may apply to this program. Admission will be based on the “Rules and Regulation” of the Institute of Graduate Studies and Research of Eastern Mediterranean University. Considering the success of the student in the field she/he has graduated and the results of the written and/or oral examination will do the selection. If it is found necessary, candidates may be accepted to the program conditionally, being required to successfully complete a deficiency program, not to be counted as credit. The aim of this deficiency program will be to increase the level of knowledge of students from other disciplines in basic mathematics and/or computer science courses.

The general degree requirements of the intended program are in accordance with the EMU by-laws. Candidates are required to complete at least 42 credit hours for graduation.

The students, which have not passed the courses in Introduction to Computers and Programming, Design and Analysis of Algorithms, Data Structures, Introduction to Probability and Statistics, Discrete Mathematics for Computing, and Linear Algebra in bachelor program, must take relevant courses as deficiency courses.

The studying the program is based on the following two options:

- Option 1: A student has to take at least 14 3-credit regular and elective courses offered by the department. According to the rules, specifications, and course quotas announced by respective departments, elective courses can be also chosen among those offered by doctoral staff of Department of Computer of Engineering, Electrical and Electronic Engineering, Department of Mathematics, and School of Computing and Information Technologies.

- Option 2: A student has to take at least 10 3-credit regular and elective courses among those described above, and IS518 Term Project. Term Project is a non-credit course that is equivalent to 4 3-credit courses.

List of master courses

IS 501 (3,0)3 Selected Topics in Information Systems I
IS 502 (3,0)3 Selected Topics in Information Systems II
IS 503 (3,0)3 Selected Topics in Information Systems III
IS 504 (3,0)3 Selected Topics in Information Systems IV
IS 505 (3,1)3 Algorithms on Graphs
IS 506 (3,1)3 Optimization
IS 507 (3,0)3 Parallel Models and Methods
IS 508 (3,0)3 Operating Systems
IS 509 (3,0)3 Database Systems
IS 510 (3,0)3 Artificial Intelligence
IS 511 (3,0)3 Object-Oriented Programming
IS 512 (3,0)3 Multimedia I
IS 513 (3,0)3 Multimedia II
IS 514 (3,0)3 Computer Graphics
IS 515 (3,0)3 Network Data Security
IS 516 (3,0)3 Data Communication and Computer Networks
IS 517 (3,0)3 Group Project
IS 518 (-,-)0  Term Project
IS 519 (3,0)3 Project Development
IS 520 (3,0)3 Decision Making and Forecasting

Course Descriptions

IS 501 Selected Topics in Information Systems
Advanced Topics in Information Systems selected by instructor.

IS 502 Selected Topics in Information Systems II
Advanced Topics in Information Systems selected by instructor.

IS 503 Selected Topics in Information Systems III
Advanced Topics in Information Systems selected by instructor.

IS 504 Selected Topics in Information Systems IV
Advanced Topics in Information Systems selected by instructor.

IS 505 Algorithms on Graphs
Graphs, trees, bipartite graphs, 0-1 matrices. Data structures for graphs, running time of an algorithm, searching techniques on graphs, connectivity, spanning tree algorithms, shortest path algorithms, matching problems, planarity, embeddings.

IS 506 Optimization
Mathematical models, unconstrained and constrained optimization problems, linear programming, network programming. Computer packages (QSB, LINDO, GAMS) for solving optimization problems.

IS 507 Parallel Models and Methods

IS 508 Operating Systems
Process management and scheduling, interprocess communication. Device management, device drivers. Interrupts, deadlocks. Memory management, swapping, virtual memory, file system. Practical study introducing well-known operating systems.

IS 509 Database Systems
Introduction to database concepts, the theory of relational database model. Semantic database models. Extended relational data model, deductive database, distributed database, object-oriented database systems. Recent database management systems.

IS 510 Artificial Intelligence
IS 511 Object-Oriented Programming
An applied programming and design course addressing object-oriented technology. Covers programming topics such as data abstraction, classes and objects, polymorphism, inheritance; contemporary object-oriented design and analysis models and methodology; and case studies of object-oriented systems.

IS 512 Multimedia I

IS 513 Multimedia II

IS 514 Computer Graphics

IS 515 Network Data Security
Introduction to privacy, data security, communication security in computers and computer networks. Trusted computer systems, issues in authentication and verification.

IS 516 Data Communication and Computer Networks

IS 517 Group Project
Group Project is a one-term project which contributes 3 credits to the students’ account. A project subject must be proposed and supervised by a doctoral instructor. A group of at least 4 students with CGPA 3.00 or above can be assigned group project starting 3rd semester of study. The expected letter grade is in the range F though A. Output of the Group Project is a software-implemented and application-oriented solution of a certain problem that can be practically used in the university or other organization.

IS 518 Term Project
Term Project is a non-credit course proposed and supervised by a doctoral instructor. Any student with CGPA 3.00 or above can register to Term Project starting 3rd semester of study. Term Project is individual work of a student that should be defended in front of a jury. Output of the Term Project is a software-implemented and application-oriented solution of certain problem that can be practically used in the university or other organizations. Jury grades the student’s work either ‘S’ or ‘U’. A student failed from Term Project must repeat it successive semester.

IS 519 Project Management
Project development and organization; risk analysis; project appraisal; contracting and negotiating; planning and scheduling: network analysis techniques; monitoring and control methods; project budgeting and financial control; conflict resolution and team building;
problem solving in project environment; project termination; application of computers in project management.

**IS 520 Decision Making and Forecasting**

Introduction to decision making; decision making process; decision trees; utility theory; group decision making; data warehousing and data mining; decision making under uncertainty; Dempster rule; fuzzy decision making; discrete event and Monte Carlo model; risk theory; decision making under risk; linear regression model and correlation; multiple regression model; exponential smoothing and time series; forecast accuracy.