



## CURRICULUM

### Master in Information Technology (MIT)

Academic Year 2020-2021

Reference CMO: CMO No. 7, s.2010 and CMO No. 15, s.2019

#### Program Description

Designed to broaden and upgrade the knowledge and skills of IT practitioners. The program aims to equip the students with the concepts and technologies that will prepare and enable them for the industrial practice of systems integration, systems administration, systems planning, systems implementation and other design and operation of IT infrastructure.

The MIT curriculum is based from the Policies and Standards (PS) for the graduate program of the Information Technology Education issued by the Commission on Higher Education (CHED) and is benchmarked from the curriculum of leading international academic institutions offering this program.

#### Program Educational Objectives

1. Engaged in professional development or post-graduate education to pursue flexible career paths adapting to innovative technological changes in information technology and related fields;
2. Demonstrated professionalism and a sense of societal and ethical responsibility in information technology practice, development and in all their endeavors; and
3. Articulated their expertise in making technical contributions to design, develop, and solve problems in their practice of information technology which meet the desired needs of the society.

#### Student Outcomes

1. Ability to apply information technology principles and practices.
2. Ability to apply suitable software engineering principles and practices to develop and maintain stable, secure, scalable, and maintainable software.
3. Ability to produce effective solutions to complex information technology problems.
4. Ability to recommend appropriate information technology solutions based on organizational needs and an evaluation of alternatives.
5. Ability to identify and discuss professional, individual, organizational, societal, and Regulatory implications of information systems and technology.
6. Ability to select technologies, policies, and procedures to assure the confidentiality, integrity, and availability of information and IT systems.

Curriculum	Total Units
a) IT CORE COURSES	12
b) IT SPECIALIZATION COURSES	18
c) CAPSTONE PROJECT	6
	<b>36</b>

## PROGRAM DURATION

### IT CORE COURSES (12 units)

- Advanced Database Systems
- Advanced Operating Systems and Networking
- Advanced Systems Design and Implementation
- Technology and Project Management

### IT SPECIALIZATION COURSES(18 units)

- Specialization 1 - Data Science
- Specialization 2 - Data Mining
- Specialization 3 - Machine Learning
- Specialization 4 - Advanced Data Security
- Specialization 5 - IOT Technology Applications
- Specialization 6 - IOT Programming

### CAPSTONE PROJECT(6 units)

- Master's Capstone Project 1
- Master's Capstone Project 2

## COURSE DESCRIPTION

<b>MITC111</b>	<b>Advanced Database Systems</b>
Course Description	Active collection, analysis, and maintenance of data is key to achieve rapid progress in almost all disciplines of science and engineering. This course will cover the core and advanced principles and techniques of data and information management. The potential topics covered in class include processing and optimization of declarative queries, transactions, crash recovery, data stream systems, Web data management (e.g. Internet and Intranet search engines), information integration (e.g., semi structured data and XML), and introduction to data mining.
Credit	3 units
<b>MITC112</b>	<b>Advanced Operating Systems and Networking</b>
Course Description	This course will discuss advanced topics and research issues in computer and operating systems. Topics will be drawn from a variety of operating systems-related areas such as distributed systems and languages, networking, security, and protection, real-time and embedded systems, modeling and analysis, principles and implementations of operating systems and networking.
Credit	3 units
<b>MITC113</b>	<b>Advanced Systems Design and Implementation</b>
Course Description	This is an advanced course in systems analysis and design that presents conceptual material about both traditional approaches to systems development such as process oriented and data-oriented methodologies and evolving approaches such as object-oriented development methods. Key stages of the systems development life cycle including planning, analysis, and design are the focus of this course. Models and procedures for understanding and modeling an organization's existing and planned information systems are presented.
Credit	3 units
<b>MITC114</b>	<b>Technology and Project Management</b>

Course Description	This course is an introduction to the basic processes of project management for instructional design projects. Students will be introduced to organizational issues, methods of planning, and techniques for managing the business and creative processes that determine the success of a project. Students will learn to use project management software for organizing, scheduling and monitoring project progress.
Credit	3 units
<b>MITO111</b>	<b>Master's Capstone Project 1</b>
Course Description	This course will require student to propose a capstone project that will introduce either a new application, technology, or process that can be used as a tool to solve an organizational or societal problem.
Credit	3 units
<b>MITO112</b>	<b>Master's Capstone Project 2</b>
Course Description	In this course the student will present the final output (system and documentation) of his/her capstone project to the School of IT.
Credit	3 units

## SPECIALIZATION

<b>MITSI11</b>	<b>Data Science</b>
Course Description	This course will introduce students to this rapidly growing field and equip them with some of its basic principles and tools as well as its general mindset. Students will learn concepts, techniques and tools they need to deal with various facets of data science practice, including data collection and integration, exploratory data analysis, predictive modeling, descriptive modeling, data product creation, evaluation, and effective communication. The focus in the treatment of these topics will be on breadth, rather than depth, and emphasis will be placed on integration and synthesis of concepts and their application to solving problems. To make the learning contextual, real datasets from a variety of disciplines will be used.
Credit	3 units
<b>MITSI12</b>	<b>Data Mining</b>
Course Description	In this course students explore how this interdisciplinary field brings together techniques from databases, statistics, machine learning, and information retrieval. Students will discuss the main data mining methods currently used, including data warehousing and data cleaning, clustering, classification, association rules mining, query floccs, text indexing and searching algorithms, how search engines rank pages, and recent techniques for web mining. Designing algorithms for these tasks is difficult because the input data sets are very large, and the tasks may be very complex. One of the main focuses in the field is the integration of these algorithms with relational databases and the mining of information from semi-structured data, and students will examine the additional complications that come up in this case.
Credit	3 units
<b>MITSI13</b>	<b>Machine Learning</b>
Course Description	This course provides an introduction to the fundamental methods at the core of modern machine learning. It covers theoretical foundations as well as essential algorithms for supervised and unsupervised learning. Classes on theoretical and algorithmic aspects are complemented by practical lab sessions.
Credit	3 units
<b>MITSI14</b>	<b>Advance Data Security</b>
Course Description	This course explores the basic components and design principles of advanced broadband networks (wireline and wireless) and how they enable essential services

	such as mobility, secure data storage, processing and transmission. This course will also introduce the student to emerging issues facing organizations considering implementing cloud computing services and mobility to enable worker productivity. Students will also be exposed to the basic pillars of network security (IA) and protecting individual privacy.
Credit	3 units
<b>MITSI115</b>	<b>IOT Technology Applications</b>
Course Description	A selected set of applications for the IoT world are introduced. In our topic on first responder networks, we attempt to build a system to detect human life under a building debris. The sensors and the algorithms designed will be described. Our topic on automotive sector includes sensors such as LiDARs and cameras used for obstacle detection. Anomaly detection in streaming will be discussed. We also explain some of the current protocols from the Wi-Fi world which have been made suitable for the V2X communication. Several applications require speech to text and we propose to explain the acoustic and language models associated with decoding. We introduce the topic of cargo monitoring in large warehouses by combining vision with learning. Our topic on localization uses the IMU sensors present in a mobile phone and combination of relevant sensors to achieve tracking. Other topics include air quality and we will discuss the issues associated with them.
Credit	3 units
<b>MITSI116</b>	<b>IOT Programming</b>
Course Description	This course teaches you how to write C-language software that controls input and output from sensors and electrical components connected to Raspberry Pi and Arduino-compatible embedded devices.
Credit	3 units

#### STUDENT OUTCOMES MAPPING

COURSE CODE	COURSE DESCRIPTION	STUDENT OUTCOMES					
		1	2	3	4	5	6
MITC 111	Advanced Database Systems	X		X			
MITC 112	Advanced Operating Systems and Networking	X		X			
MITC 113	Advanced Systems Design and Implementation	X			X		
MITC 114	Technology and Project Management	X		X			
MITC 111	Data Science	X		X			
MITC 112	Data Mining	X		X			
MITC 113	Machine Learning				X		
MITC 114	Advanced Data Security				X	X	X
MITC 115	IOT Technology Applications				X	X	X
MITC 116	IOT Programming	X	X	X	X	X	X
MITO 111	Master's Capstone Project 1	X	X	X	X	X	X
MITO 112	Master's Capstone Project 2	X	X	X	X	X	X

**PROGAM OF STUDY**

<b>FIRST YEAR</b>		
<i>First Semester</i>		
<b>COURSE CODE</b>	<b>DESCRIPTIVE TITLE</b>	<b>UNITS</b>
MITC111	Advanced Database Systems	3
MITC112	Advanced Operating Systems and Networking	3
MITC113	Advanced Systems Design and Implementation	3
Total		9
<b>FIRST YEAR</b>		
<i>Second Semester</i>		
<b>COURSE CODE</b>	<b>DESCRIPTIVE TITLE</b>	<b>UNITS</b>
MITC114	Technology and Project Management	3
MITS111	Data Science	3
MITS112	Data Mining	3
Total		9
<b>FIRST YEAR</b>		
<i>Midterm</i>		
<b>COURSE CODE</b>	<b>DESCRIPTIVE TITLE</b>	<b>UNITS</b>
MITS113	Machine Learning	3
MITS114	Advance Data Security	3
Total		6
<b>SECOND YEAR</b>		
<i>First Semester</i>		
<b>COURSE CODE</b>	<b>DESCRIPTIVE TITLE</b>	<b>UNITS</b>
MITS115	IOT Technology Applications	3
MITS116	IOT Programming	3
MITO111	Master's Capstone Project 1	3
Total		9
<b>SECOND YEAR</b>		
<i>Second Semester</i>		
<b>COURSE CODE</b>	<b>DESCRIPTIVE TITLE</b>	<b>UNITS</b>
MITO112	Master's Capstone Project 2	3
Total		3