![UM The University of Mindanao]

COLLEGE OF COMPUTING EDUCATION
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
COURSE OFFERINGS FOR SY 2022-2023

FIRST YEAR			
First Semester			
CCE 101/L	Introduction to Computing	3.0	This course focuses on the fundamentals of information technology, its theories and concepts in an ever-changing discipline and understanding its essential impact in any aspects of the society. The students able to learn the different components of computer system, especially the compatibility of the different hardware and software to make computer functional.
CCE 102/L	Computer Programming 1	3.0	This course introduces the students to the fundamentals of logic formulation together with their implementation in the Java programming language with the use of Eclipse as the Integrated Development Environment. It covers fundamental programming concepts such as algorithmic processes, data types, variables, objects, expressions, control structures (selection and looping) and file handling. This course should serve as a foundation for students in the Information Technology Program.

Second Semester			
IT 1/L	Platform Technologies	3.0	This course covers the connection between the Platform (Operating systems) and the machine-level representation of data, assembly-level machine organization, memory system organization and architecture, interfacing and communication, functional organization, multiprocessing and alternative architectures and performance enhancements.

CCE 103/L	Computer Programming 2	3.0	This course is a continuation of Computer Programming 1. The emphasis is to train students to design, implement, test and debug programs intended to solve computing problems using basic data structures and standard libraries. This course allows the student to learn and apply the basic language syntax and principles of object-oriented programming to solve computational problems adhering to the standards and guidelines of documentation. This introduces the topics on user-defined classes and ADTs, array, inheritance and polymorphism, handling exceptions and events, advance GUIs and Graphics, Recursion, searching and sorting algorithms.

SECOND YEAR			
First Semester			
CCE 104/L	Information Management	3.0	This subject covers the discussion on basic concepts and definitions of database programming, the basics of Relational Database as one of the fundamental data storage technology of an Information System. It also includes discussion on the processes involved in the development of database. In this course, the students will be able to learn on how to design database based on database design concepts and principles, able to document design using ERD and use SQL to manipulate data and information. Also, the subject focuses on database analysis, design and management applicable to students taking up BSIT.
CCE 105/L	Data Structures and Algorithms	3.0	This course introduces the students the principles of the data structures such as Arrays and Linked list implementations using Java language. It also covers different algorithms that show how to model a variety of real-world problems in computer science using appropriate forms of linear and hierarchical data structures and representing organization of a hierarchical file system and database file structure. These are exemplified by Linear List (Stack, Queues, Linked List), Hierarchical (Trees, Heaps and Priority Queues). The expected output of the course is the ability to design and create a software that uses appropriate algorithm and data structures as a solution of the newly identified problems.

IT 3/L	Networking 1	3.0	This course provides an in-depth discussion of data communication and computer networks. It includes a detailed discussion of the different Network Models, topologies and transmission media. Concepts that have a direct effect on the efficiency of a network (e.g collision and broadcast domains), different network technologies and security issues are also discussed. The course will utilize a freeware Simulator software to demonstrate subnetting, VLSM, and routing protocols. Also the course will utilize the data communication laboratory to demonstrate and perform the cable configuration and the client / server architecture.
IT 5/L	IT Elective 2	3.0	This course aims to have an understanding or object-oriented programming approach in preparation to Robotics technology. The students will learn how to setup the environment of the programming language, the syntax, variable types, operators, loops, file handling, exceptions, classes, regression expressions, CGI programming, database connection, sending email, multithreading, XML processing and GUI processing.

Second Semester			
IT 6/L	Fundamentals of Database Systems	3.0	This course is a continuation of Information Management course. It is aligned to Microsoft Technology Associate (MTA 98-368) which covers object-oriented data/database modeling, Advanced SQL, database management system (DBMS), transaction management, database optimization, and database administration. It also includes additional basic topics on data warehousing, client-server architecture, MSSQL Server, and SQLITE. The expected output of the course is the ability to design and create a database application as solution to the newly identified problems of a process.
IT 7/L	Introduction to Human Computer Interaction	3.0	The course intends to introduce students to the discipline concerned with the design, evaluation & implementation of various computing systems intended for human use. Emphasis will be placed on understanding human behavior with interactive objects, knowing how to develop and evaluate interactive software using a human-centered approach, and general knowledge of HCI design issues with multiple types of interactive applications.

IT 26/L	Professional Track for IT 3	6.0	This course introduces basic and advanced programming skills for website design. Dynamic content development will be explored through state-of-the-art programming language for creating of interactive web sites. Students will create web pages that utilize the most current advances in web applications development.
IT 10/L	IT Elective 3	3.0	The course allows the students to design, build and program a Robotics system applying mathematical, engineering and logical concepts in solving problems. At the end of the course, the students able to learn the Robotics components and its use to different fields; understand the IoT concepts and effects for signal processing, data acquisition, and wireless sensor networks. The students will also gain analysis of challenges and application patterns for user interaction related to IoT settings. The relationships between the trend and characteristic of IoT and intelligent information processing will also be discussed as well as the comparison of the internet operations and the internet of things operations. The students in this course will be utilizing a microcontroller and a Raspberry Pi to code the program. The students must have a prior knowledge on microcontroller programming using Arduino, programming with Advanced C / Embedded C or Python programming. The students in this course will utilize the Arduino devices with Raspberry Pi to implement the IoT and ERIK Robotics Kit to implement the servo motors, intelligent motors, sensors and actuators.

THIRD YEAR			
First Semester			
IT 11/L	Networking 2	3.0	This course provides an in-depth discussion of data communication and computer networks by developing an application for instant messaging from one device to another device using the TCP/IP socket and datagram socket. The students enrolled in the course able to learn about different proprietary networks, virtual LAN configuration, wireless networks, storage area networks, mobile networks, application for networks and network programming.

IT 12/L	Systems Integration & Architecture	3.0	This course covers the design and build systems and integrate them into an organization's current business processes. This knowledge area will develop the skills of IT professional to gather requirements, provide analysis, develop a system, evaluate and integrate components into a single system.
IT 13/L	Professional Track for IT 4	3.0	This course provides understanding of the event-handling methods, event propagation and exception handling, visual programming concept. It covers the study of designing basic control or objects, the use of controls with I/O functions, conditional statements, looping statements, designing and developing menus, basic controls and accessing databases. At the end of the course, the students will be able to design, code, test and debug simple event driven programs that responds to user events.
IT 14/L	Professional Track for IT 5	3.0	This course introduces students to programming technologies, design and development related to mobile applications. Topics include accessing device capabilities, industry standards, operating systems, and programming for mobile applications using an OS Software Development Kit (SDK). Upon completion, students should be able to create basic applications for mobile devices.

Second Semester			
IT 15/L	Integrative Programming and Technologies	3.0	This course covers the intersystem communications focuses on the architecture for integrating systems, DCOM, CORBA, RMI, Web services, and middleware, network programming, message and queuing services and low level data communications. At the end of the course, the student will be able to design, develop, and test a program that converts a data stream using one encoding scheme to different encoding scheme.
IT 16/L	Information Assurance and Security 1	3.0	The course covers the fundamentals aspects of security mechanism, operational issues, policy, attacks, and security domains. At the end of the course the students will be able to discuss policies and practices that may be applied to Systems Integration and Architectures to ensure secure system operation and information assurance.

IT 19/L	Technopreneurship	3.0	This course covers the principles and theories of Technopreneurship. This course prepares the students to be budding technopreneurs. At the end of the course, the students are expected to develop and present a business plan for a computing solution using a startup model. Furthermore, it is hoped that they pursue their business plans as start-ups and eventually transform them into stable IT enterprises.
IT 20/L	Professional Track for IT 6	3.0	This course explores advanced database systems, their management and their corporate role. At the heart of information technology lie database management systems, transactional database systems, data warehouses, data mining, e-commerce databases and databases for storing complex data. This course looks at the technologies, data models and policies that such systems require.

THIRD YEAR			
Summer			
IT 21/L	Information Assurance and Security 2	3.0	This course focuses on forensics, information states, security services, threat analysis model and vulnerabilities. At the end of the course, the students will be able to describe in detail the security services required to implement a specified security policy given an analysis as described in the requirement.
IT 22/L	Capstone Project 1	3.0	The course focuses on the proposal stage. The students are expected to write papers from Chapter 1 to Chapter 3. Chapter 1 composed of the Introduction, Project Context, purpose and description, objectives, scope and limitations of the proposed study. Chapter 2 composed of the related literature, studies or systems. Chapter 3 composed of the conceptual framework and the technical discussions of the technology to be utilized by the researchers. The paper will be presented in the title/proposal defense.

FOURTH YEAR			
First Semester			

IT 23/L	Systems Administration and Maintenance	3.0	This course provides tool on the market today to prepare students to support Personal Computers (PC), with updates on the most current technologies, assembling and disassembling of computer system, repairing computer system, installing and configuring hardware and software, and securing PC and small network, and supporting the most used operating system. This course transforms the students from the "just-a-user" level to the "i-can-fix-this" level for PC hardware and software matters. This course will effectively provide students the knowledge to combine tools that will reinforce them in both concepts and hands-on into real-world practice.
IT 24/L	Capstone Project 2	6.0	This subject is a continuation of Capstone Project 1 and focuses on the implementation phase of the project and evaluation of its testing. Based on the instrument constructed in pre-requisite subject, the project will be validated by IT experts in the field and research coordinator of the college, by then, it will launch an alpha testing for selected groups of users and then followed by a beta testing. The findings, conclusions, and recommendations after a series of tests and evaluation will be presented in the final defense.
IT 17	Social and Professional Issues	3.0	The course introduces ethics and ethical theories; provides discussions on the ethical dilemmas and issues facing IT practitioners. An appreciation and discussion of the Code of Ethics of I. T. Professionals, cybercrimes and appropriate Philippine Laws are also included.
CCE 106/L	Application Development and Emerging Technologies	3.0	This course covers the development of applications using web, mobile and emerging technologies with emphasis on requirement management, interface design, usability, testing and deployment, including ethical and legal considerations. The student is expected to design and develop a sufficiently computer application that solves complex problems.

Second Semester			
IT 25	Practicum Practicum	9.0	This subject is designed to expose the students to the real-world problems and situations by letting them work as on-the-job trainees in various establishments in the region. The exposure will help them acquire the skills and experiences necessary for becoming IT professionals.