Al Musanna College of Technology

Department of Information Technology

Course Description Details

Advanced Diploma Level (Internet & E-Security)

Sl.No	Course Code/Name	Course Description
	ENTW3100-Public Speaking	Speech development strategies and delivery techniques- rhetorical sensitivity and critical thinking- feedback on developing speech forms - principles of public speaking - persuasive speech - Analyze audiences for the purpose of preparing speeches – visual aids for the purpose of speech - different methods of persuasion - introductory speech, a demonstration speech, an informative speech, a persuasive speech, and a special occasion speech - speaking styles to business, government, and industry functions

MATH2200-Discrete Structure	Techniques to solve problems in probability ,counting and number theory - pigeonhole principle - counting methods - Generate functions - Recurrence relations - inclusion-exclusion formula - truth table, implications and equivalence, resolution and proof techniques - graph and set theory - characteristic of an algorithm - directed and undirected- Eulerian paths and cycles - Hamiltonian paths and cycles - Trees - h Sequential circuits - define-state machines - Deterministic and non- deterministic - finite automata - Groups and subgroups - Homomorphism and isomorphism of groups - Lagrange's theorem

Course Name : Advanced Web Technologies (Updated)	Course Code: ITSE302
Pre-Requisite : ITDB201- Web Application Development I	Credit Hours: 3
Passing Grade : Depending on the Type of the course belongs to the Audit Degree.	Level: Year 3
No. Of Theory & Practical Hours : 1 : 4	

Goal: The course provides knowledge of XML, implementation and deployment of AJAX.

Objectives: The course should enable the student to:

1. Examine functions and features of XML and AJAX.
2. Apply XML document definition, Namespaces and XSL to XML documents
3. Work with XPath in XML documents.
4. Manipulate DOM objects
5. Use AJAX to handle data.
6. Use JSON objects, Web Services , API and Protocol in AJAX

Outcomes At the end of this course, students should be able to:	Method
1. Explain the functions and features of XML.	Theory
2. Construct XML document.	Practical
3. Construct XML Document Definition.	Practical
4. Use namespace required for XML document.	Practical
5. Construct XSL (eXtensible Stylesheet Language) document using XML document.	Practical
6. Employ XPath on XML document.	Practical
7. Convert XML documents to relational and open database and the vice versa.	Practical
8. Use DOM objects.	Practical
9. Explain the functions and features of AJAX.	Theory
10. Use AJAX to handle Http objects	Practical
11. Create AJAX scripts to handle databases, XML Documents and Text Files.	Practical
12. Create AJAX based applications that use JSON objects on client and server side	Practical
13. Create AJAX based applications that use Web Services, API and Protocols	Practical

Course Name : Web Application Security	**Course Code** : ITSY303
Pre Requisite : (ITDB201 OR ITSY201) AND ITSY301	**Credit Hours** : 3
Passing Grade : C	**Level**: Advanced Diploma
No. of Theory Hrs: 2	**No. of Practical Hrs :** 2

Goal: This course aims to prepare students to demonstrate the knowledge and skills needed to deal with common web application vulnerabilities.

Objectives:

Upon completion of this course, the students should be able to:

1. Understand fundamental concepts of Web Application Technology.

2. Exhibit understanding of common threats, vulnerabilities and various types of attacks against web application security, along with appropriate countermeasures.

Outcomes	**Methodologies**
Upon completion of this course, the students should be able to:	
1.Describe the web application architecture and how HTTP protocol works.	Theory
2.Explain common vulnerabilities and threats to web applications.	Theory
3.Demonstrate various client-side and server-side attacks against web applications, including how authentication, session management, access controls and other client-side controls can be bypassed.	Practical
4. Explain the common best practices of securing web applications.	Theory
Software & Hardware Tools: Any tool	

Course Name: Software Project Management **(Updated)**	Course Code: ITSE308
Pre-Requisite: ITSE202-Introduction to Software Engineering	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree.	Level: Year 3
No. Of Theory & Practical Hours : 2:2	

Goal This course covers the management of software projects at each stage of the software development life cycle (SDLC)

Objectives: The course should enable the student to:
1. Discuss the principles of Software project management.
2. Apply the students to modern development techniques such as XP, Scrum and Test-Driven Development.
3. Manage a Software Project and Key software deliverables through each phase of the software development life cycle
4. Communicate effectively as part of a software development project team.
5. Demonstrate Cost Estimation techniques in details
6. Demonstrate the importance of Software project planning and execution.
7. Manage Software and Teams
8. Apply the concepts of Quality Management, Quality Assurance and Quality Control.
9. Apply appropriate methods and tools for the development of solutions to specific real- world Problems

Outcomes At the end of this course, students should be able to:	Method
1. Explain the concepts of Software Project Management, Knowledge Areas, Project Management Processes and Project Management Life Cycle.	Theory
2. Select appropriate project approach, methodology and process model.	Theory & Practical
3. Analyze the Software project scope ,Lifecycle ,process and Key software deliverables through each phase of the software development life cycle.	Theory & Practical
4. Analyze organization structures, position, responsibilities and authority.	Theory & Practical
5. Analyze, develop, execute and maintain a plan using methods and tools including WBS, time & effort estimates, resource allocation, scheduling and schedule control.	Theory & Practical
6. Apply the concepts of Quality Management, Quality Assurance and Quality Control.	Theory & Practical
7. Identify, quantify, mitigate and manage risks.	Theory & Practical
8. Analyze Software project execution through collecting artifacts and metrics according to Project Management procedures.	Theory & Practical
9. Evaluate set-targets, deliverables and conflict resolution documents	Theory & Practical
10. Examine interpersonal style on leadership, motivation and team membership.	Theory & Practical

Course Name: Probability and Statistics for Information Technology	Course Code: MATH311
Pre-Requisite: MATH1102 OR MATH1103	Credit Hours: 3
Passing Grade : Depending on the type of the course belongs to the Audit Degree	Level : Year 3

No. of Theory & Practical Hours 2 : 2

Course Goal(s)	The student will demonstrate the ability to apply probability and statistical methods for representing and interpreting data and communicating results, using technology when needed.

Course Objectives	Course Learning Outcomes
This course should enable the student to: 1. Demonstrate the aptitude to apply fundamental concepts in exploratory data analysis, probability theory and random variables	1. Identify different kinds of survey methods, types of data, examples of methods for organizing and summarizing data sets, including common graphical tools and summary statistics
	2. Find probabilities of single events, complementary events and the unions, intersections of collections of events, and other related probabilities using laws and counting rules
2. Understand the definitions of discrete and continuous random variables including the of the moments of these random variables	3. Contrast normal, binomial and Poisson random variables, their probability density and distribution functions, and general properties of the expectation
	4. Find probabilities for distributions over finite set based on normal distributions for which probabilities can be found without the use of calculus
3. Demonstrate knowledge on statistical methods and probability theory in practical situations.	5. Discriminate between a population and a sample; between a parameter and a statistic; and, between a confidence interval and a confidence level
	6. Identify the components of a traditional hypothesis test, including the parameter of interest, the null and alternative hypotheses and the test statistic and the p-value of a test statistic for one sample mean and difference of two sample means problems.
4. Establish understanding of how to translate real-world problems into linear models	7. Perform linear regression analysis for bivariate dataset
	8. Perform the F-test for situations where one-way ANOVA is appropriate
5. Adapt a statistical package for data analysis	9. Generate reports on exploratory data analysis, test of hypothesis, correlational analysis and one-way ANOVA using Microsoft R Open with RStudio as primary IDE

Course Name: Computer Graphics (Updated)	**Course Code:** ITSE304
Pre-Requisite: ITSE201-Programming II	**Credit Hours:** 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree.	**Level:** Year 3
No. Of Theory & Practical Hours : 1: 4	

Goal: To apply the concept of computer graphics , modeling, animation techniques, and virtual reality (VR) and augmented reality (AR) Application

Objectives: The course should enable the student to:
1. Apply the principles of 2D and 3D computer graphics.
2. Use graphic libraries to implement graphical applications.
3. Use a Graphic tool to practice 2D and 3D Modeling and Animation.
4. Create an appropriate virtual reality (VR) and augmented reality (AR) solution for an application.

Outcomes The students should be able to:	Method
1. Identify hardware components, software applications and technologies of interactive devices.	Theory
2. Describe the tools used in development of graphical systems.	Theory
3. Apply algorithms and techniques for generating 2D Attributes	Theory & Practical
4. Analyze the production of primitive graphical objects on a raster display.	Theory & Practical
5. Design graphics using two dimensional graphics, three dimensional graphics, graphics arts and animations.	Theory & Practical
6. Perform transformations on objects in the plane using suitable matrices and homogeneous coordinates.	Theory & Practical
7. Apply transformation to objects using functions and procedures.	Practical
8. Use a tool for 3D Modeling and Animation.	Practical
9. Explain the underlying technologies of VR systems and VR applications	Theory
10. Create an appropriate virtual reality augmented reality (AR) solution for an application.	Practical

Course Name: Computer Organization (Updated)	Course Code: ITSE305
Pre-Requisite: ITSE101-Programming I AND MATH2200-Discrete Structures	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree.	Level: Year 3
No. Of Theory & Practical Hours: 1 : 4	

Goal: To provide concepts of computer organization and to develop skills in assembly language programming.		

Objectives: The course should enable the student to :
1. Understand computer architecture.
2. Work with Boolean expressions.
3. Construct Sequential and Combinational logic circuits.
4. Discuss Micro programmed Control.
5. Discuss Input / Output and Memory Organization.
6. Explain pipelining and Vector Processing.
7. Construct assembly language programs.
8. Design logic circuits using appropriate tool.

Outcomes: At the end of this course, students should be able to:	Method
1. Discuss the organization of computers.	Theory
2. Use methods to simplify Boolean expressions.	Theory and Practical
3. Construct sequential and combinational logic circuits.	Theory and Practical
4. Discuss architecture of a processor including Addressing modes.	Theory
5. Discuss Micro-programmed Controller	Theory
6. Apply instruction set architecture including Data transfer, Arithmetic, Logic instructions, Machine control and interrupt instructions	Theory and Practical
7. Describe Pipelining and Vector Processing and Various interconnection structures.	Theory
8. Discuss different Memory Organizations and operations.	Theory
9. Describe Input-Output Organization.	Theory
10. Construct assembly language programs using appropriate tool.	Practical
11. Design sequential and combinational logic circuits using appropriate tool.	Practical

Course Name: Object Oriented Analysis and Design (Updated)	Course Code: ITSE306
Pre-requisite: ITSE203- Introduction to software engineering AND ITSE202- Object Oriented Programming	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree.	Level: Year 3
No. Of Theory & Practical Hours : 2:2	

Goal:	
Provides the knowledge of software analysis and design principles in object-oriented approach.	

Objectives: The course should enable the student to:

1. Explain the principles and requirements of OOA and Design
2. Describe the object-oriented approach to system development, modeling objects, relationships and interactions.
3. Discuss software design in an object-oriented manner.
4. Use a modeling languages
5. Use the tools for OOA and Design.

Outcomes: At the end of this course, students should be able to	Method
1. Discuss OOA and Design principles	Theory
2. Discuss Object-Oriented Requirements Analysis and Systems Behavior.	Theory
3. Analyze Objects and Classes of the software system.	Theory and practical
4. Construct object model using object types, attributes, structures and associations.	Theory and practical
5. Analyze Functional and Dynamic Modeling	Theory and Practical
6. Analyze Object-Oriented Methodologies	Theory and Practical
7. Use the modeling languages	Theory and Practical
8. Discuss Metrics of Object-Oriented Design	Theory
9. Use Object Oriented Design Principles and Patterns	Theory and Practical
10. Use case studies to illustrate the analysis and design concepts.	Theory and Practical
11. Use the tools for OOA and Design	Practical

Course Name: Internet of Things Fundamentals	Course Code: ITNT309
Pre-Requisite: ITSE203 - Object Oriented Programming	Credit Hours: 3
Passing Grade: C	Level: Advanced Diploma – Year 3
No. Of Theory & Practical Hours : 2-2	

Goal: To explore things and their connection to the IoT	

Objectives: The course should enable the student to:
1. Explain the concepts of the things and connections that make up the IoT
2. To Build sensor / actuator systems using Arduino Microcontroller
3. Create Python Programs to provide functionality to Raspberri Pi.
4. Create an end-to-end IoT system

Outcomes At the end of this course, students should be able to:	Method
Understand the things and connections that make up the IoT.	Theory
Build sensor/actuator systems using the Arduino microcontroller	Practical/ Theory
Develop programs in Python that provide IoT functionality to the Raspberry Pi	Practical/ Theory
Explain the use of Cloud and Fog Technology in an IoT system.	Practical/ Theory
Understand the IoT systems that can solve global problems	Practical/ Theory
Design and Build an IoT prototype	Practical/ Theory

Course Name: Mobile Application Development (Updated)	Course Code: ITSE301
Pre-Requisite: 1) ITSE203-Object Oriented Programming AND 2) ITIS103-Web Technologies	**Credit Hours:** 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree.	**Level:** Year 3
No. Of Theory & Practical Hours : 0:4	

Goal: To equip students with technical and practical knowledge of Mobile Application Development.

Objectives: The course should enable the student to: 1. Understand mobile operating systems. 2. Develop real time mobile applications. 3. Use database in mobile applications. 4. Use different types of views 5. Use service and fragments in applications

Outcomes The students should be able to:	**Method**
1. Analyze mobile operating systems	Practical
2. Analyze different phases in mobile application development	Practical
3. Build mobile application.	Practical
4. Work with the various view layout controls including Listview	Practical
5. Use database to store and manage application data	Practical
6. Working with services and Fragments	Practical

Course Name : Research Methodology	Course Code : ITIS304
Pre Requisite : MATH311 - Probability and Statistics for Information Technology	Credit Hours : 3
Passing Grade : Depending on the Type of the course belongs to the Audit Degree	Level: Year III (Advanced Diploma)
No. of Theory Hrs: 2	No. of Practical Hrs : 2

Goal: To enable students to use key concepts, terminologies, methods, techniques, and tools in writing a research relevant to Information Technology or Information System.

Objectives:

Upon completion of this course, the students should be able to:

1. Acquire knowledge on the key concepts, terminologies, methods, techniques, and tools in writing a research relevant to Information Technology or Information System.

2. Demonstrate knowledge and skills in writing a research paper.

3. Recognize the importance of research in the field of Information System.

Outcomes Upon completion of this course, the students should be able to:	Methodologies
1. Discuss the key concepts and terminologies used in information technology research.	Theory
2. Discuss the methods and techniques relevant to IT research and the key issues in IT research.	Theory
3. Present the design for a particular research method in a simulated study in the information technology area	Theory
4. Use standardized software (like PSPP, SPSS, Excel, etc.) to analyze research data.	Practical
5.Interpret data emerged from the analysis and compare it with similar research areas	Practical
6. Synthesize research and technical reports to identify the decision points, to develop plans and to create action agendas.	Practical
7. Apply research findings to real world problems.	Practical