ENGL 2100- Technical Communication	Enables students to Write effectively and manipulate audiences for various purposes and understand how workplace readers process and use documents, Plan and manage short and long-term writing projects in terms of drafting, designing, revising, and editing documents. Work with various writing technologies and electronic genres, Identify and explore problems in organizations; design and implement appropriate research strategies; and evaluate sources, Write collaboratively (e.g. co-authorship) and provide colleagues with useful feedback on their work, Using Effective style and tone to follow and adjust business and technical writing conventions, Designing visually effective documents (e.g., layout, formatting, incorporating graphics and visuals into documents). Learning to Write ethically and responsibly within the business organization and as a member of society.

Course Name : Web Application Development I	Course Code : ITDB201
Pre Requisite : ITIS103-Web Technologies	Credit Hours : 3
Passing Grade : Depending on the Type of the course belongs to the Audit Degree	Level: Diploma
No. of Theory Hrs: 1	No. of Practical Hrs : 4

Goal: To provide the student with skills needed to develop functional and dynamic database-driven web sites.

Objectives:

Upon completion of this course, the students should be able to:
1. Develop a database-driven web application using related and latest technologies.
2. Appreciate the use of new emerging web application tools that are available in the market.

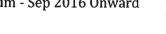| Outcomes Upon completion of this course, the students should be able to:	Methodologies
1. Describe the features, the development environment, and the capabilities of dynamic web application tools such as PHP and MySQL.	Theory
2. Describe the function of the web server and web browser (client) with examples and the way they communicate with each other using HTTP and HTTPS.	Theory
3. Compare between client-side scripting languages and server-side scripting languages with examples.	Theory
4. Compare between dynamic and static websites in terms of the requirements to build the sites and the methods where data can be physically stored.	Theory
5. Write server-side scripts of web applications that include constants, variables, data types, functions, control structures, arrays and the relevant statements to send data to the client-side in different HTML formats.	Practical
6. Work with forms, files, and directories.	Practical
7. Handle and validate the data sent by the client through HTTP post and get methods.	Practical
8. Create web page templates such as header and footer	Practical
9. Create database connectivity between the server-side script and a database server to execute SQL commands such as select, insert, update, REPLACE, and delete data.	Practical
10. Apply security to web pages using session management techniques such as cookies and user sessions.	Practical
11. Develop web applications using the latest web application tools.	Practical

Software & Hardware Tools: PHP ,MySQL, Apache

Text Book:
1. Learning PHP & MySQL, by Michele E. Davis & Jon A. Pillips,Publisher: O'Reilly; 2nd Edition (August 17, 2007)
2. Beginning PHP and MySQL From Novice to Professional, W. Jason Gilmore

Reference Book:
PHP, MySQL and Apache All in One, Julie C. Meloni, July 2009

Course Name : Structured Query Language	Course Code : ITDB202
Pre Requisite : ITDB101-Introduction to Database	Credit Hours : 3
Passing Grade : Depending on the Type of the course belongs to the Audit Degree	Level: Diploma
No. of Theory Hrs: 1	No. of Practical Hrs : 4

Goal: To prepare the students to gain skills in using Structured Query Language and its features using relational databases

Objectives:
Upon completion of this course, the students should be able to:
1. Write SQL code based on ANSI/ISO standards to build and maintain database
2. Retrieve data from single or multiple tables
3. Manipulate database content with SQL and transaction handling
4. Apply SQL security features

Outcomes Upon completion of this course, the students should be able to:	Methodologies
1. Distinguish relational database with other DBMS's	Theory
2. Create, alter and delete database objects using data definition language (DDL)	Practical
3. Apply Data Integrity constraints	Practical
4. Use constants, expressions & built in functions	Practical
5. Build queries using various operators and compound statements	Practical
6. Build relevant SELECT statements to retrieve data from a single table	Practical
7. Demonstrate data manipulation language (DML) commands	Practical
8. Apply equi-Join, Non equi-Join, self-join, natural join and outer joins to extract the data from multiple tables	Practical
9. Develop standard sub-queries and correlated sub-queries	Practical
10. Apply SQL security features (GRANT, REVOKE,ROLES and Views)	Practical
11. Apply Transaction processing commands (SAVEPOINT, ROLLBACK and COMMIT)	Practical

Software & Hardware Tools: Oracle

Text Book: Oracle Academy Course Material.

Reference Book:
1) Judith S.Bowman, Sandra L.Emerson, Marcy Darnovsky, The Practical SQL Handbook: Using Structured Query Language (3rd Edition)
2) Cecelia L. Allison, SQL Simplified:: Learn to Read and Write Structured Query Language, ISBN 1-4107-2974-5
3) Ryan S., Ron P. (2003) SAMS Teach Yourself SQL in 24 Hours, 3rd Edition. Sams Publishing.

Course Name: Routing and Switching Essentials		Course Code: ITNT201
pre-requisite: ITNT103 – Network Fundamentals II		Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree		**Level: Diploma**
No. Of Theory & Practical Hours (1:4)		
Goal: To describe the architecture, components, and operations of routers and switches in a small network.		
Objectives: The course should enable the student to : 1. Configure a router and a switch for basic functionality 2. Resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANS and inter-VLAN routing in both IPv4 and IPv6 networks 3. Troubleshoot basic operations of routers and switches in a small network		

Outcomes	Method
1. Understand and describe basic switching concepts and the operation of Cisco switches	Theory
2. Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process	Theory
3. Understand and describe how VLANs create logically separate networks and how routing occurs between them	Theory
4. Understand and describe dynamic routing protocols, distance vector routing protocols, and link-state routing protocols	Theory
5. Configure and troubleshoot static routing and default routing (RIP and RIPng)	Practical
6. Configure and troubleshoot an Open Shortest Path First (OSPF) network	Practical
7. Understand, configure, and troubleshoot access control lists (ACLs) for IPv4 and IPv6 networks	Practical
8. Understand, configure, and troubleshoot Dynamic Host Configuration Protocol (DHCP) for IPv4 and IPv6 networks	Practical
9. Understand, configure, and troubleshoot Network Address Translation (NAT) operations	Practical
Hardware Tools: Refer on the link for the complete sets of Equipment needed; https://www.netacad.com/group/program/equipment-information **Software Tools:** CISCO Packet tracer 6.3 or higher	
Book: Cisco Networking Academy (2014). Routing and Switching Essentials Companion Guide. CISCO Press: CISCO Press	
Reference Materials: CISCO Networking Academy, http://cisco.netacad.net, access on 6-April 2014	

Course Name: Network OS Administration & Security	Course Code: ITSY202
pre-requisite: Introduction to Operating Systems	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree	Level: Diploma Year – 2
No. Of Theory & Practical Hours	1 : 4

Goal: This course aims to provide students the knowledge and skills required to deploy and maintain a modern Network Operating System (NOS) along with its security features.

Objectives: The course should enable the students to:
1. Plan and setup Server environment based on the needs of an organization.
2. Implement secured services in a Network OS.
3. Troubleshoot and monitor a Network OS

Outcomes

After the completion of this course, the students should be able to
1. Plan for the implementation of a Server OS.
2. Set up a Server OS within a Domain environment.
3. Install and configure various LAN services on a Network OS.
4. Configure security features with in a Network OS.
5. Monitor and troubleshoot various LAN services in a Network OS.
6. Implement Data Backup and Recovery features.

Course Name: Object Oriented Programming	Course Code: ITSE203
Pre-Requisite: ITSE101- Programming I	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree	Level: Diploma Year 2
No. Of Theory & Practical Hours : 1:4	

Goal: This course provides the theory and practical knowledge of object oriented programming using Java.

Objectives: The course should enable the student to:

1. Understand the concepts of object-oriented programming.
2. Use Java primitives.
3. Implement abstraction and encapsulation.
4. Implement inheritance and polymorphism.
5. Work with libraries, packages, interfaces and exceptions.
6. Construct Java programs.

Outcomes At the end of this course, students should be able to:	Method
1. Discuss Object Oriented Programming Concepts.	Theory
2. Use Java Tokens, Data Types, Operators, Control Structures and Array.	Practical
3. Use the class, object and main method to construct java program	Theory & Practical
4. Perform the I/O operations on the console.	Practical
5. Use members of class like member variables, member method and constructors.	Practical
6. Use nested classes, interfaces and abstract classes.	Practical
7. Implement inheritance of java classes	Theory & Practical
8. Use different access specifiers and static keyword.	Theory & Practical
9. Create user-define packages.	Theory & Practical
10. Use wrapper classes and utility classes like Math and String.	Practical
11. Apply the concept of overloading and overriding using polymorphism	Theory & Practical
12. Handle exceptions	Theory & Practical

BAMG2111 - Entrepreneurship

BAMG2111	Entrepreneurship	3 Credit Hours
Prerequisites	None	
Goal	To introduce the student to entrepreneurship phenomenon	

Objectives	Outcomes
The student will be exposed to the theory as well the experience associated with entrepreneurship. The course will cover such area as financial management and planning, legal regulation, concepts and tools in developing new venture, communication tools in small business.	The students should be able to: 1. Explain the vital role played by entrepreneurs and small business in the global economy. 2. Define entrepreneurship and describe how entrepreneurs are different from other business-people 3. Define small business and identify the industries in which most small firms are established 4. Compare the advantages and disadvantages of small business. 5. Analyze the small business opportunities for women and the special challenges faced by this entrepreneurs 6. Describe how the small business administration functions.

	7. Recognize the important contemporary topic such as family business, small business risks, and government regulations.
	8. Recognize management process and operation management for the small firm.
	9. Develop a working model of entrepreneurship by creating a small business plan.

Course Name: Fundamentals of Computer Security	Course Code: ITSY201
pre-requisite: NIL	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree	Level: Diploma Year – 2
No. Of Theory & Practical Hours	2 : 2

Goal: This course aims to introduce students the principles, concepts, skills, and tools required to safeguard computer systems.

Objectives: The course should enable the students to:
1. Understand fundamental concepts of computer security.
2. Discuss common threats, vulnerabilities and various types of attacks against computer security, along with appropriate countermeasures.
3. Apply their knowledge and skills to secure computer systems.

Outcomes

After the completion of this course, the students should be able to
1. Describe common terminology and fundamental concepts pertaining to computer security, and the requirements that motivate the field of computer security.
2. Explain the functionality of the layers of OSI reference model and TCP/IP model, along with relevant security concerns.
3. Compare and contrast different types of malware in terms of functionality and adequate countermeasures.
4. Explain common attacks launched by intruders to compromise the security of computer systems, along with appropriate countermeasures.
5. Demonstrate adequate knowledge and skills in securing computer systems.

MATH 201	Mathematics for IT	3 Credit Hours

Prerequisites Calculus I (MATH1200)

Goal To relate the concepts and theories that underlie in the area of Numerical Analysis and some of their applications in the field of Information Technology and to provide a foundation of computer arithmetic.

Objectives	Outcomes

The course will enable the students to:

1. To understand some of the theories and applications of numerical approximation techniques

2. Familiarize with some concepts in number theory and apply them in encoding and decoding messages in Cryptography

3. Practice different operations on Matrices and determinants, use of matrices to solve linear system of equations.

The students should be able to:

1. Familiarize round-off errors and computer arithmetic.

2. Calculate the polynomial values and identify errors of polynomial equations

3. Solve nonlinear equations using numerical methods. (Bisection method & Newton's method)

4. Apply the iterated interpolation techniques using polynomial approximation.

5. Construct Taylor, Lagrange and divided difference polynomials for interpolation.

6. Understand some concepts such as Division Algorithm and some applications in Number Theory.

7. To use the applications of congruence to cryptology and solve Chinese Remainder Theorem.

8. Use some concepts of matrices: addition, scalar multiplication, product and inversion.

9. Calculate the determinant of matrices of dimension 2 and 3.

10. Solve linear system of equations using matrices and to write the inverse of a matrix.

Course Name: Course Project		Course Code: ITNT203
Pre-Requisite: ITNT201 Routing & Switching Essentials		Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree		Level: Year 2
No. Of Theory & Practical Hours : 0:2		

Goal:
This course enables students to **design and implement a secured network** system using the knowledge and skills acquired in Diploma level.

Objectives: The course should enable the student to :
1. Prepare and submit a project proposal.
2. Apply the phases of Systems Development Life Cycle.
3. Apply the networking skills.

Outcomes The students should be able to:	Method
1. Prepare and submit a course project proposal according to the specialization.	Practical
2. Apply the different phases of Systems Development Life Cycle throughout the development of the course project based on skills and knowledge acquired in Diploma level.	Practical
3. Implement networking features and security in the project.	Practical
4. Prepare well-formatted project report.	Practical
5. Demonstrate the course project.	Practical

Software Tools: Any tools
Text Book: Any books based on the tools.
Reference Book: Any books based on the tools

PHIL 3108 - Business Ethics

PHIL3108	Business Ethics	3 Credit Hours
Prerequisites	**None**	
Goal	**To equip the student with the highest ethical standards that will guide him/her through real life dilemmas.**	

Objectives	Outcomes
To enable the student to: 1. Understand the concept of value 2. Understand Islamic and Omani values 3. Understand, appreciate and respect ethnic and cultural diversity 4. Gain the highest work ethics	The students should be able to: 1. Define the concept of values 2. Define how values develop 3. Understand the effects of religion and society on values 4. Understand the effects of Islamic and Omani values on work ethics 5. Define the concept of ethnic and cultural diversity 6. Understand the importance of ethnic and cultural diversity for society and the world 7. Work with people from different ethnicities/cultures 8. Function in a moral and ethical manner in his/her life

Course Name: Logic Design		Course Code: ITNT202
pre-requisite: None		Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree		Level: Advanced Diploma
No. Of Theory & Practical Hours : 2:2		

Goal: The course introduces the practical knowledge on the fundamentals of logic design and digital circuits.

Objectives: The course should enable the student to :
1. Define, analyze and implement the design of logic gates using combinational & sequential circuits.
2. Learn how number systems are used in digital circuit technology.
3. Demonstrate the practical applications of digital technology components like logic gates, circuits and registers

Outcomes	Method
1. Describe and discuss the concept & conversions of number system, Binary Arithmetic, Binary codes.	Theory
2. Demonstrate functional and physical properties of logic gates , Truth tables and evaluation of logic circuit using practical methods	Theory & Practical
3. Explain about the basic theorems and properties of Boolean algebra with its logical operations.	Theory & Practical
4. Optimize logic circuit using Karnaugh maps and Boolean algebra.	Theory & Practical
5. Use the concept of combinational circuits to configure binary adder & subtractor, decoder, encoder, multiplexer and demultiplexer.	Theory & Practical
6. Describe the need of sequential logic with various flip-flops and latches.	Theory
7. Classify and compare various digital integrated circuits	Theory

Hardware Tools: • Digital trainer kit	
Book: Digital Design by Morris M.Mano,Prentice hall,2002	
Reference Book: Digital Design, Principles & Practices, 3rd Edition Updated by John F. Wakerly, Published by Prentice Hall	

Course Name: Introduction to Software Engineering	Course Code: ITSE202
Pre-Requisite: None	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree	Level: Year 2
No. Of Theory & Practical Hours : 1:4	
Goal: This course covers the fundamental concepts of software engineering.	

Objectives: The course should enable the students to
1- Explain the basic concepts of Software Engineering methodologies and process models.
2- Discuss phases of the Software Development Life Cycle.
3- Discuss the basic principles of Software Project Management
4- Develop skills to construct high quality software.

Outcomes At the end of this course, students should be able to:	Method
1. Explain the Software Engineering and the role of a software engineer.	Theory
2. Explain phases of the Software Development Life Cycle (requirements, design, implementation, testing, deployment, maintenance).	Theory
3. Compare software process standards and processes (like waterfall, incremental, spiral, prototyping, agile methods ...etc).	Theory
4. Examine the requirements activities such as elicitation, analysis, and specification.	Theory
5. Differentiate functional and non-functional requirements.	Theory
6. Analyze the decision-making logic and Process Specification	Theory and Practical
7. Analyze the requirements using structured approaches such as data flow diagrams.	Theory and Practical
8. Construct Software Requirements Specifications (SRS) Document.	Theory & Practical
9. Discuss how to build high-quality products.	Theory
10. Examine cost estimation techniques, software project scheduling, software configuration management and risk management for software projects.	Theory & Practical
11. Discuss Software design principles, coupling and cohesion.	Theory
12. Work as a team in the software development lifecycle.	Theory+ Practical
13. Use Case Tools and Project Management Tools.	Practical

Software Tools: MS-Project ,MS VISIO ,CASE Tools
Text Book: 1. Sommerville, I., 2004. *Software Engineering*. 8th Ed. United States: Addison-Wesley
Reference Book: 1. Roger S. Pressman., 2005. *Software Engineering: A Practitioner's Approach*. 6th Ed. United States: McGraw-Hill

Course Name: Programming II	**Course Code:** ITSE201
Pre-Requisite: ITSE101- Programming I	**Credit Hours:** 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree	**Level:** Year 2
No. Of Theory & Practical Hours : 1:4	

Goal: This course provides advanced programming concepts and techniques using high level programming language using C++.

Objectives: The course should enable the student to :
1.   Understand the advanced concepts of programming using C++.
2.   Use pointers, structures, unions, templates, macros and type qualifiers.
3.   Manage files and memory.

Outcomes At the end of this course, students should be able to:	**Method**
1. Construct programs using pre-processors, static variables, and external variables	Theory & Practical
2. Develop program using recursive and library functions (math, string and time).	Practical
3. Work with pointers including void, array and function pointers.	Theory & Practical
4. Use derived data types like structures and unions.	Theory & Practical
5. Perform file handling operations.	Theory & Practical
6. Use Dynamic Memory Management concepts.	Theory & Practical
7. Use type qualifiers and macros in programs.	Theory & Practical
8. Create templates in C++.	Theory & Practical

Hardware / Software Tools: C++ Compiler and Integrated development environment
Text Book: C++: The Complete Reference by Herbert Schildt, Published by Osborne
Reference Book: 3.   The C++ Programming Language, by Bjarne Stroustrup, Published by Addison-Wesley Pearson Education   4.   Schaum's Outline of Programming with C++ by John Hubbard Published by McGraw Hill

Course Name: Introduction to Cryptography	Course Code: ITSY301
pre-requisite: NIL	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree	Level: Advanced Diploma
No. Of Theory & Practical Hours	2 : 2

Goal: This course aims to familiarize students with the fundamental concepts and applications of cryptography.

Objectives: The course should enable the students to:
1. Understand basic principles and concepts of modern cryptography.
2. Understand the functionality of various classical and modern cryptographic ciphers.
3. Appreciate the core techniques of cryptography and how they can be applied to meet various security goals.
4. Use various cryptographic tools/utilities.

Outcomes

After the completion of this course, the students should be able to
1. Describe the terminology and fundamental concepts pertaining to the domains of cryptography and steganography.
2. Demonstrate the understanding of various classical substitution and transposition ciphers, and various types of classical substitution ciphers i.e. Simple, Homophonic, Polygram and Poly-alphabetic.
3. Compare and contrast symmetric, asymmetric and hybrid cryptosystems in terms of their functionality, types, strengths and weaknesses.
4. Describe the goals of data integrity, authentication and non-repudiation and how one-way hash functions, message authentication codes and digital signatures can be used to achieve these goals.
5. Discuss the operation and unique strengths of one-time pad, and how pseudo-random key streams limit the implementation of one-time pad in computers.
6. Describe the concepts of certification authority (CA) and digital certificates.
7. Demonstrate understanding of various modern symmetric-key and public-key ciphers, along with the modes of operation of symmetric-key ciphers.
8. Use cryptographic tools and utilities to comprehend the real-world application of symmetric, asymmetric and hybrid cryptosystems.
9. Discuss various legal issues related to information security.

Course Name: Course Project		Course Code: ITSE204
Pre-Requisite: 1) ITSE202- Introduction to Software Engineering 2) ITDB201-Web Application Development I		**Credit Hours:** 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree		**Level:** Year 2
No. Of Theory & Practical Hours : 0:2		

Goal: This course enable students to develop a software system using the knowledge and skills acquired in Diploma level.

Objectives: The course should enable the student to :
  1. Create a proposal for the course project based on a real scenario.
  2. Apply the phases of Systems Development Life Cycle.
  3. Apply the soft skills.

Outcomes At the end of this course, students should be able to:	**Method**
1. Create a proposal for the course project based on a real scenario.	Practical
2. Apply the different phases of Systems Development Life Cycle throughout the development of the course project.	Practical
3. Practice work ethics and communication skills.	Practical
4. Prepare well-formatted standard documents	Practical
5. Demonstrate the course project.	Practical

Software Tools: Any tools
Text Book: Any books based on the tools.
Reference Book: Any books based on the tools

Course Name: Data Structure and Algorithms (Updated)	Course Code: ITSE205
Pre-Requisite: ITSE203- Object Oriented Programming	Credit Hours: 3
Passing Grade: Depending on the Type of the course belongs to the Audit Degree	Level: Diploma Year 2
No. Of Theory & Practical Hours : 1:4	
Goal: This course provides proficiency in implementation of Data Structures	
Objectives: The course should enable the student to: 1. Analyze the complexity of algorithms. 2. Implement list, stack, queue, tree and graph data structures. 3. Implement searching, sorting and hashing techniques. 4. Implement data structures.	

Outcomes At the end of this course, students should be able to:	Method
1. Use arrays, Pointers, Structures and Abstract data types	Theory and Practical
2. Discuss Big Oh, Theta and Omega notations	Theory
3. Apply Big Oh to calculate complexities of algorithms	Practical
4. Implement Linear list and single, circular and doubly linked lists	Theory and Practical
5. Implement stacks, queues and tables using linear and linked representation	Theory and Practical
6. Use Linear and Binary Search	Theory and Practical
7. Apply operations on trees such as traversal (Pre-order, In-order and Post-Order), searching, insertion, updating and deletion.	Theory and Practical
8. Construct Binary Tree and Binary Search Tree (BST)	Theory and Practical
9. Use Insertion, Selection, Bubble, Quick, Merge, Radix sorting	Theory and Practical
10. Construct Graphs	Theory and Practical
11. Implement hashing techniques	Theory and Practical
12. Use algorithms to perform operations such as insertion, searching, updating and deletion on various data structures	Theory and Practical
13. Implement data structures.	Practical