Higher Diploma in Software Development

Module Descriptions:

Full Title: Computer Systems, Operating Systems & Networks

Module Description
To provide an understanding of the structures and functions of computer systems, computer operating systems and to outline the principles of computer networking

Learning Outcomes
On completion of this module the learner will/should be able to
1. Understand the structures and functions of the component parts of a computer system
2. Write elementary assembly programs
3. Understand the common features of an operating system (OS)
4. Install and configure a multi-user (Linux) OS
5. Use the administrative tools of an OS (Linux) to register new accounts, groups, etc
6. Understand the physical and logical principles of data communications networks, in particular the TCP/IP architecture
7. Design and build a structured cabled Ethernet LAN

Full Title: Web Development

Module Description
This module provides learners with an understanding of web development technologies and the skills required to develop websites with content that conform to W3C standards.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Describe the structure and operation of the World Wide Web.
2. Develop HTML web pages that conform to W3C standards.
3. Apply Cascading Style Sheets (CSS) to web pages in order to separate form from content.
4. Demonstrate an understanding of the principles of design in relation to the web development process.
5. Publish and maintain a website.
6. Use JavaScript to add dynamic content to web pages.
7. Develop Responsive Web pages using a frontend framework

Full Title: DBS Architecture, Design and Programming

Module Description
This module aims to provide a comprehensive knowledge and experience of the relational database model and its effective design, administration and implementation in order to support data driven applications.

Learning Outcomes
On completion of this module the learner will/should be able to

1. Explain the Relational Database model and how it is used to support Data Driven Applications
2. Carry out the major tasks (analysis, design, programming, administration) associated with the implementation of an n-tier database system.
3. Implement the administrative functions of a DBMS.
4. Demonstrate a systematic understanding of current theoretical and technical knowledge employed in logical relational database design.

Full Title: Introduction to Programming

Module Description
This module provides an introduction to the discipline, methodologies and techniques of computer programming using a contemporary programming language.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Apply the concepts of computer programming in the development of programming solutions to problems
2. Select appropriate programming constructs for use in programs.
3. Define and implement abstract data types as representations of real world data.
4. Design and implement programs that instantiate and manipulate objects of defined abstract data types.
5. Design and construct user interfaces applying appropriate HCI and usability criteria.
6. Work cooperatively in groups in the development of software applications.

Full Title: Systems Modelling

Module Description
This module covers areas such as UML modelling, software engineering in the context of the Object Oriented paradigm.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Explain and analyse OO concepts and software engineering principles in the context of OO software development.
2. Develop a range of UML diagrams and carry out structural and behavioural modelling.
3. Use a CASE tool for diagram development.
4. Appraise and explain modern approaches to software lifecycle, methodology, and software engineering

Full Title: Algorithms & Data Structures

Module Description
This module is aimed at providing an understanding of the essential characteristics of basic recursive algorithms and dynamic data structures.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Design and implement recursive functions.
2. Identify problems that are better suited to being programmed recursively.
3. Choose and apply suitable data structures and algorithms for particular problems.
4. Create and manipulate dynamic data structures such as stacks, queues, graphs and binary trees.
5. Explain conceptually the mechanisms used by various sorting and searching algorithms.
6. Implement these algorithms in an Object oriented language.

Full Title: Data Driven Applications Design and Implementation

Module Description
This module aims to provide a comprehensive knowledge and experience of the design, administration and programming practices required for effective implementation of data driven applications.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Build and test supporting infrastructure for Data Driven Applications
2. Design and build data driven web applications.
3. Utilise multiple Application Programming Interfaces (APIs)to various commercial DBMS
4. Design and build data driven desktop/client applications.

Full Title: Software Product Development Management

Module Description
Successful learners of this module will have a broad knowledge of the relevant issues, skills and techniques that may be used as a basis of performing an effective professional/management role in software development.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Demonstrate and apply a comprehensive knowledge of the disciplines which support effective management of software product development.
2. Apply the methodologies of project management to software product development.
3. Apply iterative incremental methodologies for rapid software product development
4. Utilise appropriate skills to analyse and resolve complex management issues in a software engineering management role.
5. Demonstrate an awareness of the current professional issues in the software industry.

Full Title: Software Development Project

Module Description
To allow the learner to demonstrate the ability to meet project milestones and to produce deliverables within schedule for a project requiring the application of software engineering principles and techniques. The project will progress from problem statement to testing and demonstration. The learner would be expected to apply appropriate techniques of literature review, information gathering, interpretation, consolidation and presentation for the presentation of a technical report.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Deploy appropriate theory, practices and tools for the specification, design, and implementation of a software system.
2. Work effectively as an individual, demonstrating time management and appropriate organisational skills.
3. Apply appropriate investigative/research skills.
4. Elicit and analyse project requirements, then construct and refine appropriate UML models.
5. Document their investigative/research and software work in a project report according to specified project guidelines.

Full Title: Enterprise Application Development

Module Description
This module is designed to equip learners with the advanced features required to build and deploy enterprise solutions.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Develop robust and dynamic web content using Java.
2. Identify and analyse criteria to manage and process large quantities of data.
3. Demonstrate a critical comprehension of enterprise application development.
4. Create innovative solutions using 3rd party software providers.

Full Title: Application Development

Module Description
This module is designed to equip learners with the advanced features required to build and deploy comprehensive solutions.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Develop innovative and customised solutions using Internationalization.
2. Select and implement measures to enable multithreading in order to make applications more responsive and interactive.

3. Identify and analyse criteria to manage and process large quantities of data.
4. Demonstrate a critical comprehension of networked applications.
5. Assimilate new and existing technologies.

Full Title: Software Engineering

Module Description
Software engineering is a systematic and disciplined approach to developing software. It applies both computer science and engineering principles and practices to the creation, operation, and maintenance of software systems. The aim of the module is to provide students with an understanding of, and application of, Software Engineering best practices.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Appraise and explain modern approaches to software lifecycle, methodology and software engineering for the OO software development paradigm.
2. Assess and explain requirements elicitation and analysis phases and be able to conduct requirements elicitation and analysis activities.
3. Assess and explain system and object design and be able to conduct system design and object design activities.
4. Describe and analyse software testing and prototyping. Conduct functional and structural software testing

Full Title: Work Placement

Module Description
This placement module will provide students with an opportunity to apply the theoretical and practical knowledge gained on their programme while working in a professional IT environment. It will also afford them the opportunity to gain valuable career experience and developed their understanding of working in such an environment.

Learning Outcomes
On completion of this module the learner will/should be able to
1. Critically analyse the enterprise/work environment, its culture and organization.
2. Demonstrate the appropriate written/oral communication skills required of the professional practitioner.
3. Apply knowledge, skills and competencies acquired during the programme of study to the analysis and solution of workplace problems.
4. Take responsibility for performing tasks and project work under the guidance of peers and of an industrial supervisor.
5. Reflect on and analyse the learning experience resulting from the work placement.
6. Demonstrate initiative and leadership skills whilst working alone and in teams.