HIGHER CERTIFICATE IN INFORMATION TECHNOLOGY

COULD THIS BE YOU?

You're working full-time. You've got your feet on the ground, your fingers on the keyboard and the need to spread your wings.

OR

Although you have no formal training, you're already working in the IT industry. The point is you want to improve your knowledge and gain new or enhance existing skills to take you even further in this fast growing field.

If you say, "Yes" to any of these questions, our Higher Certificate in IT is definitely the answer for you.

COURSE OBJECTIVES

The main objective of the course is to provide you with a wide-ranging, sound, academically based and industry oriented training course during which you'll be steeped in software design and development; exposed to a wide range of technologies that will shape the future of computer applications over the next few years; fully grounded in both the theoretical and practical aspects of IT.

And just for the record, you'll be in good company, (in more ways than one)
Our track record is, to say the least, quite impressive, including delegates from companies such as Standard Bank, Spoornet, Siemens Nixdorf, First National Bank, Liberty Life, Eskom, SANDF, SAA and the SABC.

ENTRANCE REQUIREMENTS

The minimum entrance requirements are:

- A matric certificate or equivalent qualification.
- Practical experience in the IT industry.

Please note: Each candidate will be individually selected by the Academy.

COURSE FORMAT

The course is offered part-time over 2 years, which consists of 10 modules, offered as:

Part-time block sessions of two weeks per module where you need to attend lectures from 18:00 to 21:00 daily in 8 block sessions over 2 weeks, spread over two years (6 Modules in 1st year and 4 in 2nd year).

Please note:

The block sessions consist of lectures and practical classes presented on campus. To qualify for the certificate, all 10 modules must be completed successfully.

THE MODULES

MODULE 1: Introduction to Program Design and Programming, using the Visual Basic programming language

This module will cover:

-   An introduction to important concepts by way of an in-depth case study. The design of each stage of the problem will be discussed at length, and the necessary constructs will be introduced by way of pseudo code.
-   An introduction to a wide variety of design problems, which will be implemented using Visual Basic.
-   Thorough groundwork which will equip you with practical, hands-on experience in program development.

In short; even experienced programmers would benefit from the well-structured and well-disciplined approach to programming offered by this module.

MODULE 2: The use of Basic Data Structures, using the Visual Basic Programming Language

Module 2 includes the following:

-   An expansion of the programming concept as discussed in module 1.
-   The case study introduced during Module 1 will be used to illustrate concepts at an advanced level of design and implementation.
-   Introduction to the concept of basic data structures, such as arrays and structures.
    (The implementation will be completed in Visual Basic)
-   Functional discussion and illustration of advanced structures, such as stacks and queues, by means of practical design-oriented problems.

Please note:

Modules 1 & 2 will focus mainly on the design of sound, correct and safe programs - covering data structures and procedures constituting the building blocks of good programming. Although

the medium of instruction will be Visual Basic, other programming languages could easily be learnt once these modules have been completed.

MODULE 3: Databases

This module will deal with:

- The selection, design and implementation of database systems.
- A strong focus on design.
- The entity-attribute relation (EAR) analysis.
- The object-oriented model.
- A detailed study of the client/server model for distributed processing.
- Practical work conducted in Microsoft Access.

MODULE 4: Software Engineering

This module will entail:

- A state-of-the-art-overview of software development in general.
- Discussions of the functional information flow approach, as well as the object-oriented approach to software generation.
- Stimulation of critical thinking regarding the software generation process.
- A review of concepts such as life-cycle models and various methodologies.
- The foundation from which to launch several projects which will be completed in the course of modules 5 & 10.

MODULE 5: Project Design

The main focus of this module will be the launch of a comprehensive design project, the topic which will be chosen in consultation with the Academy. Your work will be evaluated by way of project documentation, presentation and, possibly, a demonstration.

Please note:
- Module 5 is a prerequisite for Module 10.
- Attendance of regular progress meetings is compulsory.

MODULE 6: Operating Systems
Part 1

This section will be devoted to the architecture of computer systems, including:

- An overview of computer systems (CPU, peripherals, memory, control unit, arithmetic – logic unit, buses, etc.)
- The main elements of processor design, using the Intel 80x86 processors as a basis.
- A brief overview of later developments such, as parallel, superscalar and RISC Processors.
- Discussion of the characteristics of primary and secondary as well as cache memory.

Part 2

This section will focus on:

- The role of operating systems in the creation of environments conducive to program execution.
- The role of an operating system in its capacity as manager of computer resources, such as CPU time, memory and secondary storage.
- Introduction to concepts such as user interfaces, file systems, multi-tasking, scheduling, protection, paging and virtual memory.
- A brief overview of commercial operating systems such as MS Windows and UNIX.

MODULE 7: Information Security

There can be no doubt that Information Security as a discipline has become of age. Firstly, the profile of Information Security has risen immensely in the last few years, and secondly a sound theoretical basis for understanding Information Security has emerged.

Developments like the Internet, WWW-based banking systems, electronic commerce and the like, has catapulted Information Security from the technical environment right onto board room and executive management level.

A good, well balanced knowledge has become essential – not only to IT people, but also to all other players in the field. It has become dangerous to equate Information Security to, for eg, firewalls. The "Have firewall – are safe" syndrome is dangerous because it fosters "Information Security Complacency" amongst involved parties – especially senior management and board members. Information Security is pervasive throughout a company, and is not based on one or more tools.

Information Security has involved, and has established itself as a disciple in its own right - a discipline based on sound theoretical principles or services. If these principles of Authentication, Authorization, Confidentiality, Integrity and Non-repudiation are understood, the whole implementation and management of Information Security are simplified. Firewalls now become a mechanism to implement Authorization, encryption a mechanism to implement Confidentiality; Access control lists a mechanism to implement Authorization etc, etc.

These principles from the basis of internationally accepted Information Security Architectures. This course will introduce Information Security as a specific discipline.

Please note:

Although the main objective of the course is not to turn laymen into Information Security fundis, it will provide an overview of all the relevant aspects of the field, and will create a greater general awareness of the subject.

MODULE 8: Data Communication and Networks

This module will focus on:

- The principles underlying data communication across computer networks.
- The basic principles underlying WAN's, LAN's and the Internet.
- Introduction to the network world by way of the 7-layer OSI model, with special reference to specific aspects of the model, e.g.:
  - characteristics of the physical layer;
  - topologies and message routing;
  - packet switched networks;
  - data-linked protocols;
  - data transmission; and
  - error handling
- Network management aspects such as Information Security.
- Introduction to new developments, such as the ATM protocol for multimedia networks.
- The most important LAN architectures and protocols.
- Recent developments on the Internet.
- Specific reference to the TCP/IP protocol.

MODULE 9: Project Management

The background:

Fortune Magazine rates IT project management as "Career Number 1" and the field has become a top career choice for many highly talented professionals. Today, IT project managers play a key role in launching new products and managing special projects. As project team leaders, project managers create strategies and orchestrate carefully designed action plans to complete projects successfully incorporating complex, dynamic requirements. Both the Gartner Group and Standish Group report that organisations worldwide are increasingly focusing on strengthening their IT management skills, especially IT project management skills.

The course contents:

The main objective of this module is to expose you to the discipline of IT project management. To this end, it will entail:

- Introduction to IT Project Management
- The IT Project Management Context and Processes
- The 9 knowledge areas
  - IT Project Integration Management
  - IT Project Scope Management
  - IT Project Time Management
  - IT Project Cost Management
  - IT Project Quality Management
  - IT Project Human Resource Management
  - IT Project Communications Management

- IT Project Risk Management
- IT Project Procurement Management

MODULE 10: Project Implementation

In the course of this module, you will be required to implement a workable prototype of the design completed in Module 5. The software-developing environment will be Microsoft Access, and you will need to be proficient in Access. (Keep in mind that no training for Microsoft Access will be provided.)

Please note:
- Compulsory project progress meetings will be held regularly.

EXAMINATION PROCEDURES

Each module will be examined individually – either by way of a project or examination. Most modules will be examined on the first evening of the next module.

TUITION FEES

R3750.00 per module for 2021

Please note:
- All training fees, lecture notes and examination fees are included in the above-mentioned amounts.
- Students must buy their own textbooks - ± R 700.00 per module. Textbooks will be available at the Bookshop on Auckland Park Kingsway Campus.
- Only a limited number of students will be accepted each year.
- Fees are reviewed annually.

GENERAL INFORMATION

The closing date for applications is the first Friday of January

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Please note:
- The Higher Certificate in IT is an extracurricular course that does not affect your entrance to, or credit towards, any university course. Once your application is approved, you will be notified of the relevant lecture times and dates in advance.