

BSc (Hons) Information Systems - E311

1. Objectives

In today's competitive business environment, companies require professionals who are not only technically competent but who also have the ability to exploit the opportunities offered by new management approaches. The design and management of information systems is essential for both the daily running of business activities and survival of the organisation itself.

With the increasing demand for IS professionals, graduates of this Programme can expect to find a wide range of attractive career opportunities in information technology as well as information management.

The Programme has been tailor-made to provide a thorough understanding of relevant management issues and a sound knowledge of computer-based solutions required by organisations. Students are exposed to the use of information systems in business, commerce and more technically to the ways in which information systems are developed, utilised and managed. The Programme focuses on the values and characteristics of information systems, the practical tasks of analysis, design, development and implementation, while paying due attention to the psychological and social impact of introducing major organisational changes.

The Programme is aimed at those who wish to pursue a broad career related to the design, development and implementation of Information Systems. It covers a range of techniques that will be invaluable to those intending to follow a technical, managerial or organizational role within the field of Information Systems.

Overall the study Programme has been designed to cater for the needs of information systems professionals who wish to play a major role in the Business Information systems of the future.

2. General Entry Requirements

As per General Entry Requirements for admission to the University for Undergraduate Degrees.

3. Programme Requirement

At least 2 GCE 'A' Level Passes including Mathematics.

4. Minimum Requirements for Awards

(i) Degree Award

| <u>MODULES</u> | <u>CREDITS</u> |
|-------------------------|----------------|
| Humanities & Management | 9/15 |
| Departmental | 93/87 |
| TOTAL | 102 |

For the award of the **BSc (Hons) Degree in Information Systems**, the student must obtain at least 102 credits including 84 credits from all the core modules prescribed by the department and at least 18 credits from the elective modules.

(ii) Diploma Award

A student may opt for a Diploma in Information Systems provided s/he satisfies the following minimum requirements. The Diploma project would normally be of 8 weeks duration for an input of at least 90 hours.

| <u>MODULES</u> | <u>CREDITS</u> |
|-------------------------------|----------------|
| Humanities & Management | 9 |
| Departmental | 48 |
| Diploma Project (CSE 2000(3)) | 6 |
| TOTAL | 63 |

5. **Programme Duration** - Normal 3 years,
Maximum 5 years

6. **Credits per Year:** Maximum 48 credits, Minimum 18 credits, subject to regulation 5.

Semester modules to be registered for on a semester basis.

Yearly modules to be registered for only once at the start of the module, normally at the beginning of academic year.

7. **Assessment**

Continuous and written assessment of modules

Each module will be assessed over 100 marks (i.e. expressed as %) with details as follows (unless otherwise specified):

Assessment will be based on written examination and continuous assessment. The written examination will be of 3-hour duration except for the modules MGT 1111(1), ACF 1002(1), LAWS 3002(5), MGT 1200(1) and ACF 1200(1) for which the exam will be of 2-hour duration. The continuous assessment will carry 30% of total marks except for the following modules:

| | Continuous Assessment | Exams |
|--|------------------------------|--------------|
| CSE 1004Y(1) - Structured Systems Development | 40% | 60% |
| CSE 2003Y(3) - Web Technologies | 50% | 50% |
| CSE 2007Y(3) - Multimedia Applications Development | 40% | 60% |
| CSE 1008 - Communication Skills for IT | 100% | - |
| CSE 3015Y(5) - Network Design and Services | 50% | 50% |

Continuous assessment may be based on laboratory work and/or assignments and should include at least two class tests (one per semester) except for CSE 1008, MGT 1111(1), ACF 1002(1), LAWS 3002(5), MGT 1200(1) and ACF 1200(1) for which there should be at least one class test.

For a student to pass a module, a minimum of 30% should be attained in both of Continuous Assessment and Written Examination separately, with an overall total of a minimum of 40% in that module.

Diploma project

For those students exiting at Diploma level, the assessment of diploma project CSE 2000(3) will be partially based on a project report.

Final year project

The assessment of final year project CSE 3000(5) will be partially based on a project report.

8. Interruption of Studies

Students may be allowed to interrupt studies for a minimum period of one academic year subject to their satisfying provisions in the general regulations in respect of interruption of studies.

9. Specific Regulations

If CPA < 40, the student will have to repeat the entire academic year, and retake the modules as and when offered. However, s/he will not be required, if s/he wishes, to retake module(s) for which Grade C or above has been obtained.

Students are allowed to repeat only once over the entire duration of the Programme of Studies.

10. List of Modules - BSc (Hons) Information Systems

| <u>CORE MODULES</u> | | Hrs/Wk | Credits |
|----------------------------------|---|---------------|----------------|
| | | L+P | |
| Humanities and Management | | | |
| MGT 1111(1) | Organisation and Management | D.E. | 3 |
| Departmental | | | |
| CSE 1008 | Communication Skills for IT | 2+0 | 0 |
| CSE 1002Y(3) | Programming Methodology | 2+2 | 6 |
| CSE 1003Y(1) | Mathematics for Computing | 3+0 | 6 |
| CSE 1004Y(1) | Structured Systems Development | 2+2 | 6 |
| CSE 1006Y(1) | Introduction to Information Systems | 2+2 | 6 |
| CSE 1007Y(1) | Computer System Organisation | 3+0 | 6 |
| CSE 2001Y(5) | Software Engineering | 2.5+1 | 6 |
| CSE 2002Y(3) | Database Systems | 2+2 | 6 |
| CSE 2003Y(3) | Web Technologies | 2+2 | 6 |
| CSE 2007Y(3) | Multimedia Applications Development | 2+2 | 6 |
| CSE 2008Y(3) | Interactive System Design | 2+2 | 6 |
| CSE 3003Y(5) | Information Systems: Advanced Concept | 3+0 | 6 |
| CSE 3004Y(5) | Multimedia Systems | 3+0 | 6 |
| CSE 3000(5) | Project | - | 9 |
| <u>ELECTIVES</u> | | | |
| Humanities and Management | | | |
| ACF 1002(1) | Principles of Finance | 3+0 | 3 |
| LAWS 3002(5) | Cyber Laws | 3+0 | 3 |
| MGT 1200(1) | Introduction to Marketing | 3+0 | 3 |
| ACF 1200(1) | Accounting Principles and Techniques | 3+0 | 3 |
| MGT 3111(3) | Operations Management I | 3+0 | 3 |
| MGT 4100(5) | Strategic Management I | 3+0 | 3 |
| MGT 3211(3) | Operations Management II | 3+0 | 3 |
| MGT 4200(5) | Strategic Management II | 3+0 | 3 |
| Departmental | | | |
| CSE 3006Y(5) | Operations Research and Simulation | 2+2 | 6 |
| CSE 3012Y(5) | Communication Technologies | 2+2 | 6 |
| CSE 3013Y(5) | Management Support Systems | 2+2 | 6 |
| CSE 3014Y(5) | System Security and Control | 2+2 | 6 |
| CSE 3015Y(5) | Network Design and Services | 2+2 | 6 |
| CSE 3016Y(5) | Virtual Reality and Entertainment Systems | 2+2 | 6 |
| CORE MODULE FOR DIPLOMA | | | |
| CSE 2000(3) | Diploma Project | - | 6 |

*Note: All 3 credits module run only over one semester.

11. Programme Plan - BSc (Hons) Information Systems

YEAR 1

| Semester 1 Code CORE | Module Name | Hrs/Wk L+P | Credits | Semester 2 Code CORE | Module Name | Hrs/Wk L+P | Credits |
|----------------------------|--------------------------------|---------------|---------|----------------------------|--------------------------------|---------------|---------|
| CSE 1002Y(3) | Programming Methodology | 2+2 | - | CSE 1002Y(3) | Programming Methodology | 2+2 | 6 |
| CSE 1003Y(1) | Mathematics for Computing | 3+0 | - | CSE 1003Y(1) | Mathematics for Computing | 3+0 | 6 |
| CSE 1004Y(1) | Structured Systems Development | 2+2 | - | CSE 1004Y(1) | Structured Systems Development | 2+2 | 6 |
| CSE 1006Y(1) | Introduction to IS | 2+2 | - | CSE 1006Y(1) | Introduction to IS | 2+2 | 6 |
| CSE 1007Y(1) | Computer System Organisation | 3+0 | - | CSE 1007Y(1) | Computer System Organisation | 3+0 | 6 |
| MGT 1111(1) | Organisation and Management | D.E. | 3 | CSE 1008 | Communication Skills for IT | 2+0 | 0 |

YEAR 2

| Semester 1 Code CORE | Module Name | Hrs/Wk L+P | Credits | Semester 2 Code CORE | Module Name | Hrs/Wk L+P | Credits |
|----------------------------|-------------------------------------|---------------|---------|----------------------------|--------------------------------------|---------------|---------|
| CSE 2001Y(5) | Software Engineering | 2.5+1 | - | CSE 2001Y(5) | Software Engineering | 2.5+1 | 6 |
| CSE 2002Y(3) | Database Systems | 2+2 | - | CSE 2002Y(3) | Database Systems | 2+2 | 6 |
| CSE 2003Y(3) | Web Technologies | 2+2 | - | CSE 2003Y(3) | Web Technologies | 2+2 | 6 |
| CSE 2007Y(3) | Multimedia Applications Development | 2+2 | - | CSE 2007Y(3) | Multimedia Applications Development | 2+2 | 6 |
| CSE 2008Y(3) | Interactive System Design | 2+2 | - | CSE 2008Y(3) | Interactive System Design | 2+2 | 6 |
| ELECTIVES | | | | ELECTIVES | | | |
| ACF 1002(1) | Principles of Finance | 3+0 | 3 | MGT 1200(1) | Introduction to Marketing | 3+0 | 3 |
| LAWS 3002(5) | Cyber Laws | 3+0 | 3 | ACF 1200(1) | Accounting Principles and Techniques | 3+0 | 3 |

YEAR 3

| Semester 1 Code CORE | Module Name | Hrs/Wk L+P | Credits | Semester 2 Code CORE | Module Name | Hrs/Wk L+P | Credits |
|----------------------------|--|---------------|---------|----------------------------|--|---------------|---------|
| CSE 3000(5) | Project | - | - | CSE 3000(5) | Project | - | 9 |
| CSE 3003Y(5) | Information Systems: Advanced Concepts | 3+0 | - | CSE 3003Y(5) | Information Systems: Advanced Concepts | 3+0 | 6 |
| CSE 3004Y(5) | Multimedia Systems | 3+0 | - | CSE 3004Y(5) | Multimedia Systems | 3+0 | 6 |
| ELECTIVES | | | | ELECTIVES | | | |
| (5) | Elective 1 | 2+2 | - | (5) | Elective 1 | 2+2 | 6 |
| | Elective 2 (Departmental/FLM) | - | - | | Elective 2 (Departmental/FLM) | - | 6 |

12. Outline Syllabus

This outline syllabus is not prescriptive and is intended to serve as a guide only.

Note: Pre-requirement (PQ), Pre-requisite (PR).

ACF 1002(1) - PRINCIPLES OF FINANCE

The Financial System; Capital Markets; An Analysis of the Mechanisms of the Financial System in the Economy: Theory and Current Statistics; Time value of money; Capital Budgeting: an introduction; Valuation of Financial Assets; Bond Analysis: an introduction; Risk, Return and Diversification; Efficient Market Hypothesis; Multinational Finance: an introduction.

ACF 1200(1) - ACCOUNTING PRINCIPLES & TECHNIQUES

Depreciation; Correction of Errors; Control Accounts; Value Added Tax; Stock Valuation Methods; Partnerships; Goodwill and Changes in Partnerships; Incomplete Records; Accounting for Not-for-Profit Organisations; Limited Companies; Business Purchase; Accounting Standards & Desirable Attributes of Accounting Information; Cash Flow Statement; Interpretation of Financial Statements.

CSE 1002Y(3) - PROGRAMMING METHODOLOGY (L/P - 6)

Pseudocode; Structured Programming Techniques; Program Structure; Simple Data Type; Control Structures; Modularity; Structured Data Types; Introduction to Object Oriented Programming; Programming Style and Testing, Abstract Data Types, Arrays, Linked Lists, Stacks, Queues, Trees, Graphs, Operations on Trees and Graphs.

CSE 1003Y(1) - MATHEMATICS FOR COMPUTING (L - 6)

Types of matrices, Determinants, Cramer's rule, Solution to Systems of Linear Equations, Eigenvalues, Eigenvectors, Vector Algebra, Nature of Statistical Data, Data collection, Presentation of data, Central Tendency Measurement, Time series analysis, Probability, Sampling, Regression Analysis, Sets, Proofs; Relations; Functions; Recurrences; Series; Combinations; Graphs Theory; Trees, Binary Operations, Groups; Rings; Fields, Propositional Calculus.

CSE 1004Y(1) - STRUCTURED SYSTEMS DEVELOPMENT (L/P - 6)

Introduction to SSAD; Software life cycles, Introduction to information systems, Components in a system, Preliminary investigation, Requirements Gathering, Requirements Modelling, Data flow analysis, DFD, Data Dictionary, Systems Design, ERD, State Transition Diagram, systems implementation, software design, flowcharts, review methods, managing the development process, estimation and management of development time, Testing, Maintenance Fundamentals of computer applications development, Application Architectures, Databases, Implementation of databases, User interface development, Query By Example, Queries using SQL, Database Access, Forms and Controls, Reports.

CSE 1006Y(1) - INTRODUCTION TO INFORMATION SYSTEMS (L/P - 6)

Computer history -hardware – software - data and information - files and databases - Operating software - applications packages - communications technologies – networks - the Internet - programming concepts - information systems life cycle –development methodologies - roles in systems development - management of change - information storage and display information handling, Information systems in organisations, information technology at a national policy level - social and organisational aspects of systems development.

CSE 1007Y(1) - COMPUTER SYSTEM ORGANISATION (L - 6)

Digital Number System, 2's Complement System, Coding Schemes, Logic Gates, Boolean Algebra and Theorems, Combinational Circuits, Karnaugh Map, Decoders, Encoders, Multiplexers, Flip-Flops, Statements and Logic Operators, Logical Equivalence, Tautologies and Contradictions, Conditional and Bi-conditional, Tautological Implications and Tautological Equivalences, Rules of Inference, Arguments and Proofs, First Order Predicate Logic. Hardware Components of a Computer, Storage of Instructions, Data Transfer between Memory and Peripheral Devices, Port Definitions, Interrupts, DMA, Secondary Storage Devices, Elementary Error Detection and Correction, Keyboards, Display Techniques, Memory Management, Management of Processes, Structure of an OS, Processor Architectures, Introduction to Networks.

CSE 1008 - COMMUNICATION SKILLS FOR IT

Scientific Writing; Report writing – preparation of title, abstract, introduction, material preparation, result writing, discussion writing, references, acknowledgements, designing effective tables and preparing effective illustrations; use and misuse of English; Oral presentations.

CSE 2000(3) - DIPLOMA PROJECT (P - 6)

Analysis, Design and Implementation of computerised solution to a real-life problem.

CSE 2001Y(5) - SOFTWARE ENGINEERING (L/P - 6) (PQ: CSE 1002Y(3))

Data abstraction, encapsulation, classes, objects, inheritance, polymorphism, aggregation, OO analysis and design using UML, patterns and frameworks, components and component object models, software engineering concepts and practices, software processes, software process improvement, CMM, requirements engineering, software modelling and design techniques, software quality assurance, software project management, software evolution, software maintenance, software procurement.

CSE 2002Y(3) - DATABASE SYSTEMS (L/P - 6) (PQ: CSE 1004Y(1))

DBMS functions/Components, Database Abstractions, Relational Model ERD, Relational algebra, Normalisation, Query Language – SQL, DB design issues, Optimisation, Security Issues, Transactions, Distributed Computing, Synchronization, Overview Of Distributed Databases, Distribution Transparency, Distributed Database Design - Commit Protocols And Concurrency Control, Query Processing.

CSE 2003Y(3) - WEB TECHNOLOGIES (L/P - 6) (PQ: CSE 1002Y(3))

Overview of Internet, Internet Protocols and Network Components; HTML; XML; Scripting languages; Client-side scripting; Server-side scripting, Hypermedia; Data processing on a web server (ASP, Asp. NET, PHP, Cold Fusion); Concepts of Web-based applications; Integrating applets; Administration of web servers; Principles of E-Commerce; Administration of web servers; Web site related issues; Web site design issues.

CSE 2007Y(3) - MULTIMEDIA APPLICATIONS DEVELOPMENT (L/P - 6)

Multimedia fundamentals; Issues on multimedia representation and processing; Principles of colour, sound, animation and video; Creation and Editing of graphic images, sounds, text, video and animation; Production, storage, manipulation and communication of multimedia assets; Integration of a range of multimedia assets into an effective and appropriate stand-alone multimedia application.

CSE 2008Y(3) - INTERACTIVE SYSTEM DESIGN (L/P - 6)

Introduction to HCI; Components of HCI; Humans and Technology; User Interface design; Interface Evaluation Techniques; Characteristics of a good UI; User Centered UI; Design tools and methods; Interactive System Design; Prototyping Techniques; Evaluation Techniques; Designing Graphical User Interfaces.

CSE 3000(5) - PROJECT (9)

Analysis, Design and Implementation of computerised solution to a real-life or research-oriented problem.

CSE 3003Y(5) - INFORMATION SYSTEMS: ADVANCED CONCEPT (L - 6) (PQ: CSE 1006Y(1))

Nature & Importance of IS Management; Categories of Information Systems; Roles of IS Managers; Measurement of the IS Function; Information Infrastructures; Strategic Alignment of IT with Business; Planning for Information Systems; Enterprise Resource Planning, Management of IS Operations: Structure & Policies, Contract & Procurement Strategies, Outsourcing Techniques, Security & Control; Managing IS-Based Change; Audit, Evaluation, & Assessment. Overview of MIS; Planning and Control, Identifying and Defining User Needs, Systems Theory, Transaction Processing Systems, Decision Support Systems, Executive Information Systems, Abstracts and Models, Business Process Re-engineering, Analysis and Design Techniques, End-user Participation in Systems Development, Acquisition of Hardware and Software, Vendor Hardware and Software Proposals, Planning for Innovation and Change, Systems Evaluation, Network Security, Systems Maintenance.

CSE 3004Y(5) - MULTIMEDIA SYSTEMS (L - 6)

Multimedia components: definition, representation, application; hardware and software involved, design of Multimedia systems, Operating Systems/ Storage systems support, Multimedia Databases, Multimedia Interfaces: principles and design; Multimedia Coding and Compression; Multimedia Information Retrieval Systems, Case Studies.

CSE 3006Y(5) - OPERATIONS RESEARCH AND SIMULATION (L/P - 6)

Linear Programming; Simplex Algorithm; Transportation Problems; Network Techniques; Game Theory; Markov's Chains; Queuing Theory; Simulation.

CSE 3012Y(5) - COMMUNICATION TECHNOLOGIES (L/P - 6)

Network models, Topologies, Transmission, Mobile networks, Network integration, Switching, signalling, Transmission line, PBX, ISDN, Packet switched networks, TCP/IP, network design and management, Troubleshooting, Policy, Voice-Over IP, Video conferencing, Switched, Fast and gigabit networks, WAP, network economy and planning. OSI model, customer premise equipment, call centres.

CSE 3013Y(5) - MANAGEMENT SUPPORT SYSTEMS (L/P - 6) (PQ: CSE 1002Y(3))

KBS Architecture, Knowledge Representation, Inference, heuristics, Knowledge acquisition, Explanation facilities, KBS life-cycle, KBS, development tools, Uncertainty, Case Based Reasoning, Data Warehousing, KDD Applications, Data pre-processing, Data Mining Techniques, Web mining ,OLAP, Decision Support Systems, DSS Architecture and life cycle, Planning, Trends.

CSE 3014Y(5) - SYSTEM SECURITY AND CONTROL (L/P - 6)

Cryptology, historical ciphers, modern ciphers attack, efficient cryptographic primitives, data integrity and authentication, digital signature schemes, key exchange and key management, standard protocols, mobile communications security, key escrow schemes, zero-knowledge identification schemes, Smart cards and PCMCIA cards, quantum cryptography, firewalls cryptographic technology and services, tunnelling protocols, virtual private networks, intrusion detection systems.

CSE 3015Y(5) - NETWORK DESIGN AND SERVICES (L/P - 6)

The Kernel, Core features of Linux, Connectivity, NFS, Network Configuration, IP Addressing, Sub-netting, Subnet Masks, Gateways, IP Aliases, DNS Server, IP Chains, Samba Server, Access Control, Permissions, ARP and RARP, ICMP, BOOTP and DHCP Servers, TCP Ports and Protocols, UDP, Dial-in/Dial-Out Server, Telnet and SSH, Print Server, FTP, Web Server, Mail Server, SMTP and POP3, DNS Server, NAT, IP Masquerading, Firewalls, VPNs, System Maintenance, Network Security, Proxy Server.

CSE 3016Y(5) - VIRTUAL REALITY AND ENTERTAINMENT SYSTEMS

Introduction to Virtual Reality; Virtual Reality Hardware and Software; VR Applications in Education, Science and Technology; VR applications in Social Sciences and Humanities; Available Platforms, Game Development tools, Cross-Compilation and Cross-Platform Development, Games Life Cycle, Market Trends, Psychological and Sociological Aspects of Computer Games, Story Telling and Narration, Simulators, Planning, Implementation.

LAWS 3002(5) - CYBER LAWS

Legal effects of electronic evidence. Digital signatures. Internet law; domain names and the law. Electronic money, online credit card payments, and electronic bills of lading. Computer-related intellectual property rights. Hardware and software contracts. Data protection. Cyber crimes.

MGT 1111(1) - ORGANISATION & MANAGEMENT

Management Concepts and Functions. Development of Management Theories. The Internal and External Environments of the Organisation. Social Responsibility and Ethics in Management. Managerial Decision Making. The planning process. The nature of Organisation Structure. Organisational Control. Contemporary issues in Management. Management in Future.

MGT 1200(1) - INTRODUCTION TO MARKETING

Understanding marketing, The Marketing Environment, Information Systems & Marketing Research, Customer Buying Behaviour, Segmentation, Target Marketing & Positioning, The Marketing Mix: Product, Price, Place, Promotion). Strategic Planning.

MGT 3111(3) - OPERATIONS MANAGEMENT I

Operations Systems and the firm. Importance of Operations management. Types and characteristics of manufacturing and service systems. Production planning and control. Inventory Management. Production Routing and Scheduling. Quality Control.

MGT 3211(3) - OPERATIONS MANAGEMENT II (PQ: MGT 3111(3))

Just-In-Time. Supply-Chain Management. Human factors, Equipment and maintenance. Forecasting. Capacity planning and operations scheduling. Plant layout. Manufacturing planning (MRP). Work study.

MGT 4100(5) - STRATEGIC MANAGEMENT I

Strategic Planning: Tools and Techniques. Environmental Scanning: The SWOT Analysis, Analysis of the Competitive Environment (Porter's Five Forces model). Introduction to Strategy Formulation at: Corporate level, Business level, Functional level. Introduction to Strategy Implementation, Evaluation and Control.

MGT 4200(5) - STRATEGIC MANAGEMENT II (PQ: MGT 4100(5))

Strategic Management Tools and Techniques: Value Chain, Financial Statement Analysis (Performance Ratios), Portfolio Analysis (BCG Matrix, GE Matrix). Strategy Formulation: Ansoff Matrix, Porter's Generic Strategies (cost leadership, differentiation, focus), Identification and evaluation of strategic alternatives. Strategy Implementation: Framework for understanding implementation issues, Tactical aspects of strategy implementation. Strategy Evaluation and Control. Integrative Case Analysis.