

Higher Diploma Syllabus



IMIS

The Professional Association for IS Professionals



IMIS

..... supporting IS students

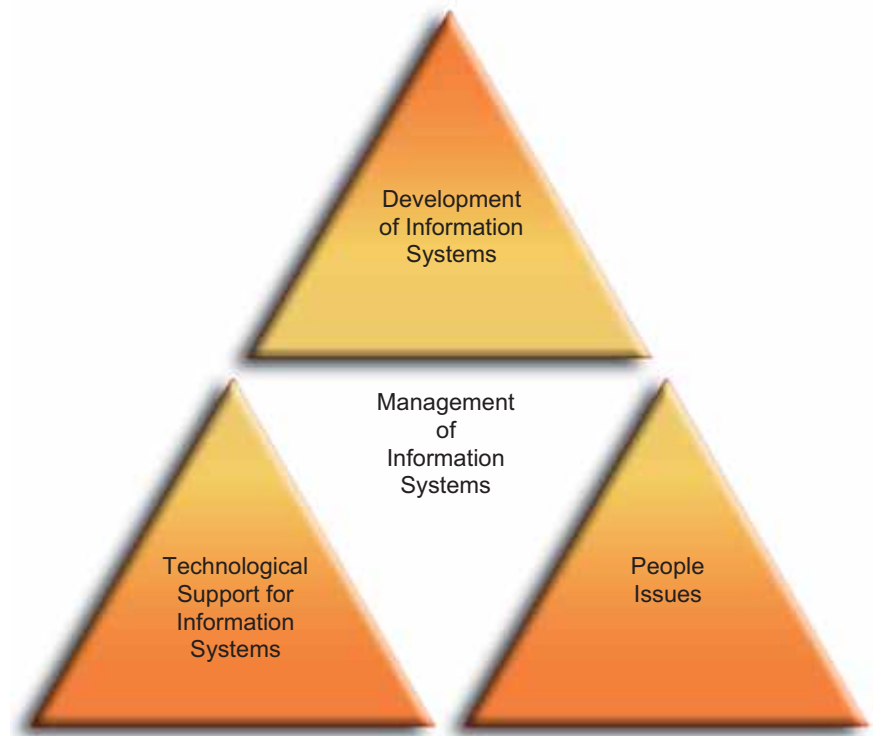
***Around the globe ...
..... into the future***

**The Institute for the Management
of Information Systems Syllabus**

The Institute for the Management of Information Systems

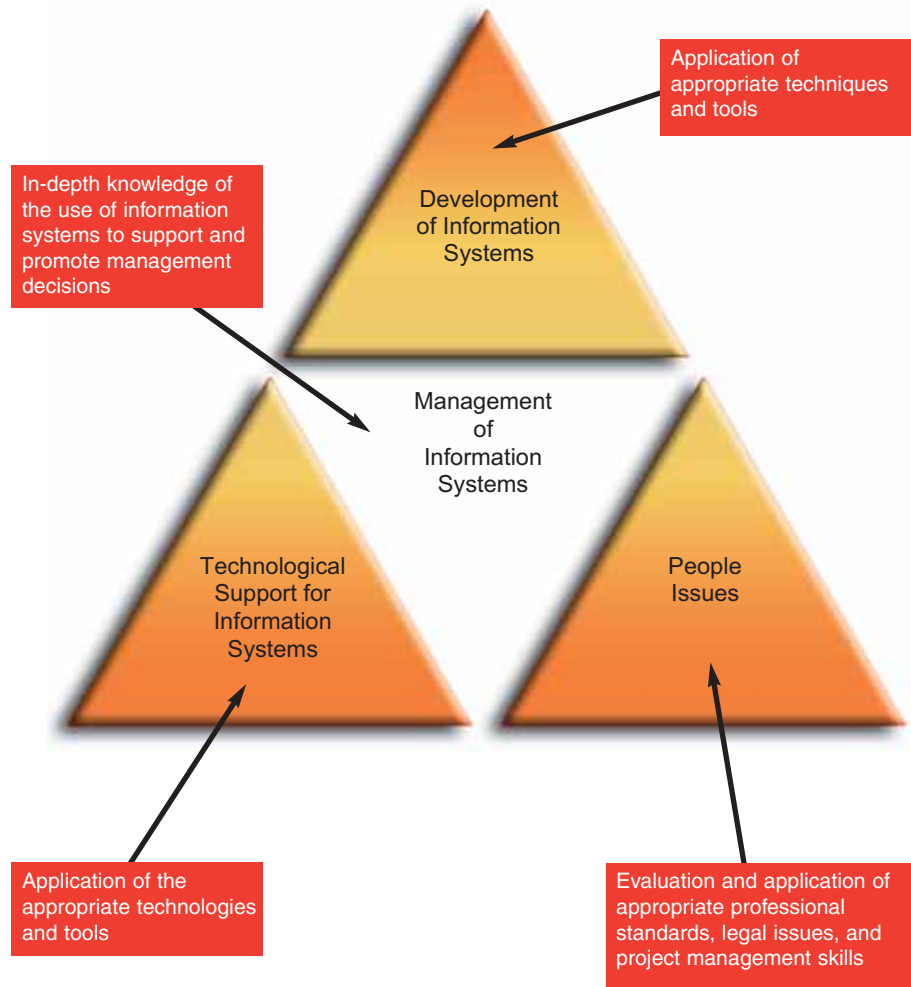


HIGHER DIPLOMA SYLLABUS





HIGHER DIPLOMA AIMS





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INTRODUCTION

The syllabus across all levels is based on four themes, which are developed within and across the levels. Concepts, principles, methods and ideas may be introduced at one level and be expanded in a conceptually more demanding next level. Modules may be based predominantly on one theme but of necessity topics will be integrated. The principal theme, Management of Information Systems (IS), includes the study of IS and decision making at all levels in organisations together with the management of IS from the development of business and IS strategies through to eventual information system obsolescence. Structural and organisational issues regarding the Management of the Information Systems Development Process are included.



It is recognised that IS professionals will play a part in the planning, development, use and/or control of information systems. Therefore, additional supporting themes have been identified. The theme, Development of Information Systems, enables students to understand the process and apply techniques involved in the development and implementation of high quality technology-based solutions to business problems. The emphasis is on requirements determination, specification and design. However, students will have the opportunity to build a simple system. Implications for legacy systems will also be included. The theme, Technological Support for Information Systems, includes an understanding of the technology used within information systems and how current and emerging technologies can influence the success of business organisations. Appropriate tools to support the techniques used in IS development and management are addressed. The theme, People Issues, focuses on issues relating to all stakeholders involved in the management, development, implementation and operation of information systems. Knowledge and application of the IMIS Code of Ethics will enable students to understand the standards required for working as an Information Systems professional. Students will consider the wider societal implications of such professionals. The concepts and processes associated with project management are addressed.



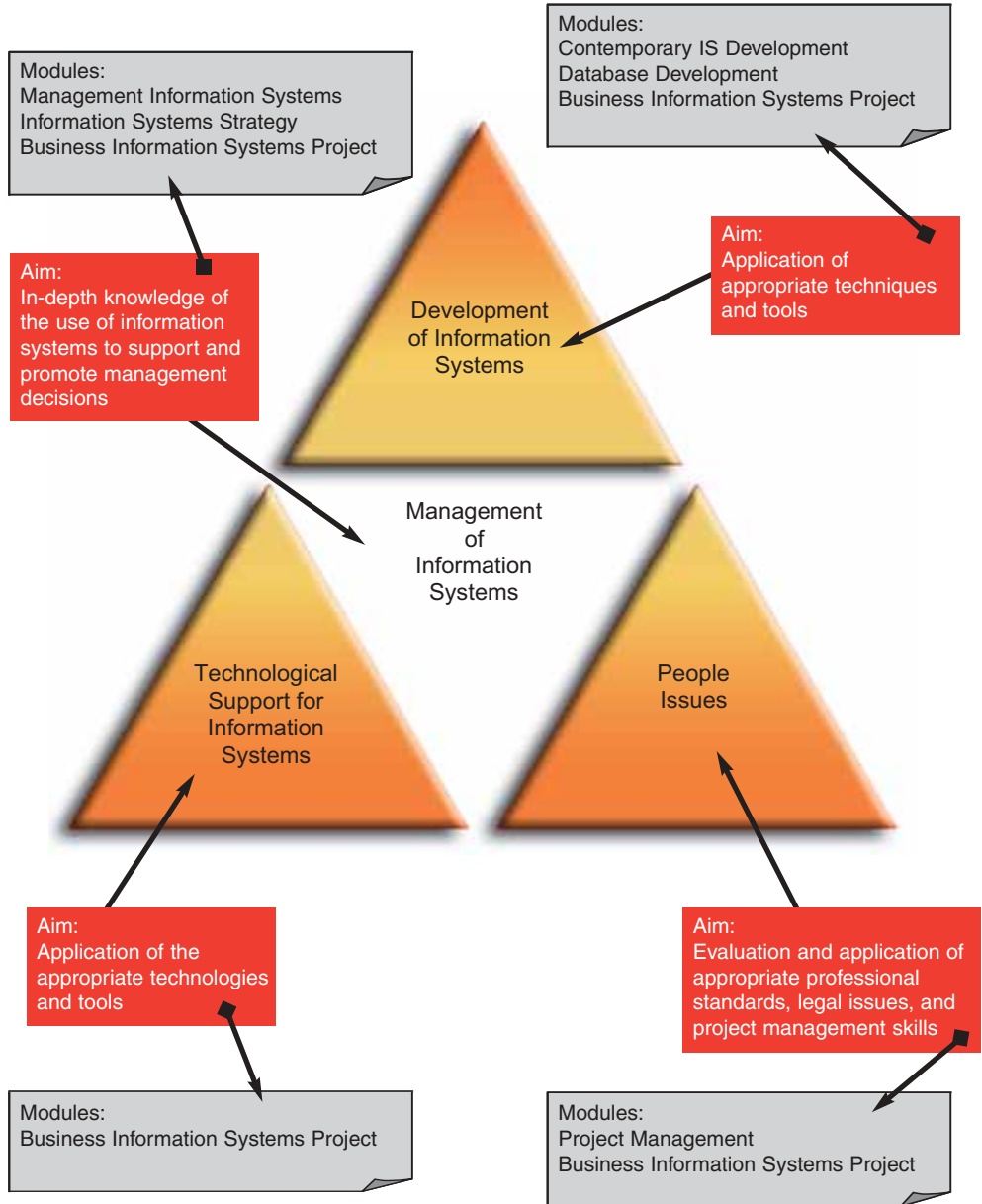
MAPPING OF QUALIFICATIONS AND PROPOSED IMIS EQUIVALENTS

NQF Level	QAA HE Level	Typical CATS Equivalent*	General	Occupational	Other	IMIS Qualification	IMIS Membership & SFIA Level
8	HE5		PhD/DPhil (Research) PhD/DPhil (Taught)	NVQ Level 5			
7	HE4		MPhil/Masters/PG Cert/PG Dip				
6	HE3	360/120@3	Honours Degree	NVQ Level 4			MIMIS SFIA Level 5
5	HE2	240/120@2	Diploma of HE		HND/HNC BCS Diploma	Higher Diploma	AIMIS SFIA Level 4
4	HE1	120/100@1	Cert. of HE			Diploma	LIMIS SFIA Level 3
3 Advanced Level			A Level Free-standing mathematics units level 3	NVQ Level 3	BTEC Nationals	Foundation Diploma	Practitioner SFIA Level 1 / 2
2 Intermediate Level			GCSE A* - C Free-standing mathematics units level 2	NVQ Level 2	BTEC First		
1 Foundation Level			GCSE D - G Free-standing mathematics units level 1	NVQ Level 1	BTEC Introductory Cert/Diploma		
Entry Level				Certificate of (educational) achievement			

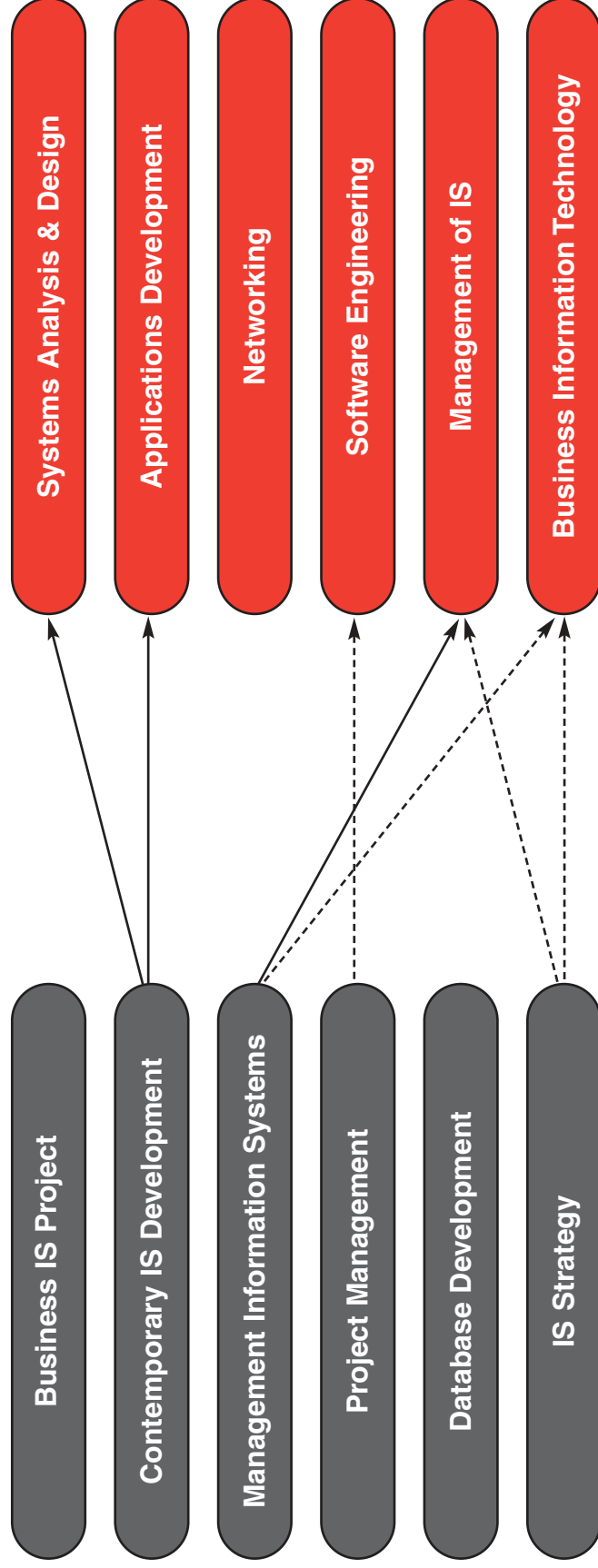
* CATS – The CATS values are given as the total number of credits followed by the minimum at a specified level.



HIGHER DIPLOMA MODULES



COURSE COMPARISON



Higher Diploma Aims and Learning Outcomes

Aims:

To provide students with:

H1. Management of IS

An in depth knowledge of the use of information systems to support and promote management decisions in the context of the modern work environment and the ability to apply such knowledge to address management related issues.

H2. Development of IS

An understanding and ability to apply appropriate techniques and tools within a given approach to information systems development, taking into account the historical context.

H3. Development of IS/Technological Support for IS

An opportunity to demonstrate how to apply appropriate technological systems and infrastructures to support a business information systems solution.

H4. People Issues

An understanding and ability to evaluate and apply appropriate techniques, which achieves successful project management and implementation that is socially desirable and legally compliant.

Learning outcomes:

Management of IS

H1.1 Evaluate the strategic options available to different business entities and the ways in which the business and information systems strategies can be aligned and integrated.

H1.2 Evaluate a range of information systems solutions.

H1.3 Examine the options for establishing and maintaining information systems integrity.

Development of IS

H2.1 Model business situations to inform the development process using accepted standards.

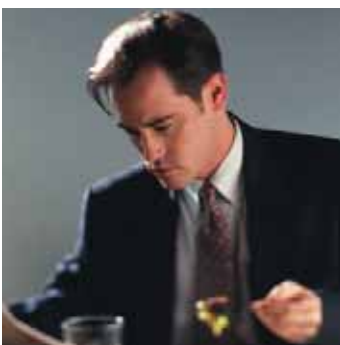
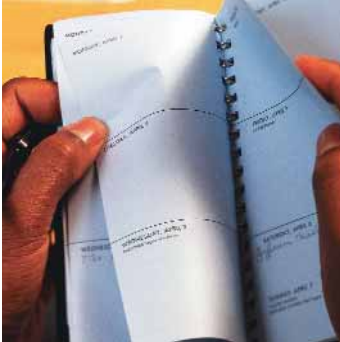
Development of IS/Technological Support for IS

H3.1 Respond to a requirements specification by analysing and designing a contextually relevant solution.

People Issues

H4.1 Examine the social and legal impacts of developing and implementing information systems and the role played by Information Systems professionals in addressing such issues.

H4.2 Determine effective strategies for managing information systems development.



Higher Diploma Module Mapping to Learning Outcomes

Mapping includes primary and secondary foci.

H1.1	Evaluate the strategic options available to different business entities and the ways in which the business and information systems strategies can be aligned and integrated.		X					
H1.2	Evaluate a range of information systems solutions.	X	X					
H1.3	Examine the options for establishing and maintaining information systems integrity.		X					
H2.1	Model business situations to inform the development process using accepted standards.				X	X	X	X
H3.1	Respond to a requirements specification by analysing and designing a contextually relevant solution.					X	X	X
H4.1	Examine the social and legal impacts of developing and implementing information systems and the role played by Information Systems professionals in addressing such issues.	X	X					
H4.2	Determine effective strategies for managing information systems development.							
		Management IS						
		IS Strategy	X					
		Contemporary IS Development				X	X	X
		Database Development					X	
		Project Management						X
		Business IS Project	X					X



Syllabus Guidance Notes



1. The syllabus modules are documented in the sequence in which they should be studied. This is for your guidance, as prior knowledge may be required. It is also suggested that the Business Information Systems Project should be studied after completing the first five modules of the Higher Diploma.
2. IMIS members who log on to the IMIS website (www.imis.org.uk) have access to (www.emeraldinsight.com). This website allows IMIS members instant and unlimited full text access to over 35,000 articles from Emerald's international management portfolio of more than 100 Emerald Journals, complete with full text articles back to 1994. Subject coverage spans a spectrum of management disciplines including strategy, leadership, quality, information management, marketing, HR and much more.
3. Within the recommended reading section for each module there is also a section for some modules entitled Additional Reading. This follow-up work is suggested to extend the student's knowledge in various topic areas and they should not necessarily expect to be able to follow up everything. Also, colleges should expect to provide assistance with acquisition to resources, either by acquiring the resources, or by providing students with access to these resources through electronic information services (which may require subscriptions). Obviously, colleges and students may also gain access to such services as provided through their IMIS membership.
4. The Diploma Syllabus Guidance Notes for the use of a CASE (Computer Aided Software Engineering) tool still apply at that level. For the Higher Diploma, where specific modules refer to the consideration of a CASE tool, the tool should support object-oriented development in general and the Unified Modelling Language in particular.

Suitable tools include Together, Rational Rose, JBuilder 9 Enterprise Edition, and Visio. A cut down, free version of Together is available at <http://www.borland.com/together/designer/index.html>.

If none of these products are available the open source Argo UML from <http://argouml.tigris.org/> may be downloaded. It is fully featured (and free) but is restricted to the use of Java.



5. All data models should conform to the Chen notation. Examination questions involving data models will adopt this notation.

6. Any Project Management Tool chosen for use on the Higher Diploma should have the facilities to set up projects, manage tasks and resources, track schedules and report project information. Specifically it should be able to produce work breakdown structures, gantt charts, and network diagrams (activity on node). Suitable tools include Microsoft Project or similar. Examination questions involving network diagrams will adopt the activity on node notation.

7. The software SoDIST™ Project Auditor (SPA) was developed by Don Gotterbarn and Simon Rogerson. In conjunction with David Gleason they have formed the Software Development Research Foundation (SDRF) to improve software quality. The SoDIST™ method is a cost-effective, value-building approach that results in highly successful projects and developer maturity. Unlike other methods, SDRF's unique tools integrate the work plan, the project stakeholders and ethical practice into a coherent analytic framework that can improve project outcomes for all participants while lowering total cost of ownership.

SDRF has made available a fully functional prototype version of SPA. This is available freely for use in the classroom. SPA can be downloaded from: <http://www.sdresearch.org>

The Higher Diploma Modules in Detail



Theme:	Management of Information Systems
Course:	Higher Diploma
Module Title:	Management Information Systems
Module Code:	H31
Resources:	Students should have a working knowledge of the IMIS Code of Ethics and be able to understand and apply the ethical and legal concepts contained therein
Assessment:	By a single 3-hour externally set examination paper
CATS Equivalent:	200 Notional Hours: 80 Hours Structured, 120 Hours Directed Self-Study



SPECIFIC COURSE AIMS AND LEARNING OUTCOMES:

H1.2 Evaluate a range of information systems solutions.

H4.1 Examine the social and legal impacts of developing and implementing information systems and the role played by Information Systems (IS) professionals in addressing such issues.

MODULE AIMS:

To provide students with:

- An understanding of the roles of various types of management information systems in business organisations. (A1)
- An appreciation of the emerging business technologies, environments and practices, and their impact on management information systems. (A2)
- Knowledge of the relationship between the decision making process, the organisational hierarchy and the supporting management information systems. (A3)
- An awareness of the key role of management information systems in facilitating competitive advantage in business. (A4)
- Knowledge of security and control aspects of management information systems. (A5)
- A professional approach to applying management information systems to business environments. (A6)



MODULE LEARNING OUTCOMES:

Students should be able to:

A1:

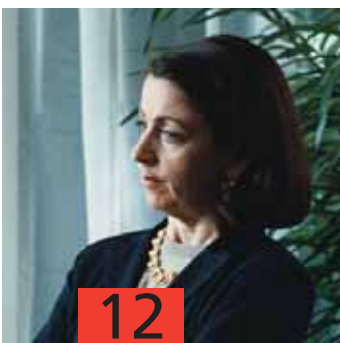
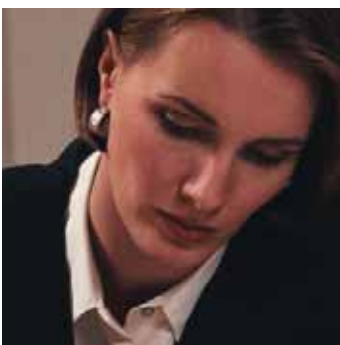
- Discuss the relationship between the business organisation, processes and functions and the associated supporting management information systems. (LO1)
- Explain appropriate management information systems for the range of business functions and organisational levels. (LO2)

A2:

- Explain how new technology is impacting on business processes and associated management information systems. (LO3)

A3:

- Discuss the managerial decision making process in business. (LO4)
- Explain the relationship between decision making and management information systems at different levels of the organisation. (LO5)





- Evaluate the importance of collaborative decision making environments and review group management information systems. (LO6)
- Explain the concepts of knowledge and knowledge management in the management information systems context. (LO7)

A4:

- Explain the key requirement of competitive advantage that drives the need for management information systems and its manifestation through processes such as Supply Chain Management (SCM), Enterprise Resource Planning (ERP), organisational redesign and change. (LO8)

A5:

- Discuss the risk, security and control issues associated with management information systems. (LO9)

A6:

- Review the range of professional issues, which are associated with business activities and management information systems. (LO10)

DETAILED MODULE CONTENT:

LO1: The Business Organisation and Supporting Management Information Systems

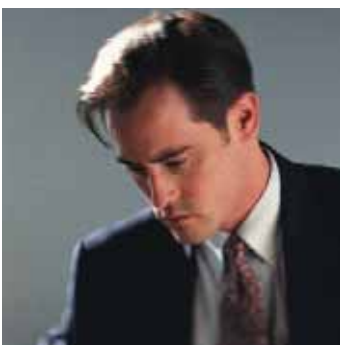
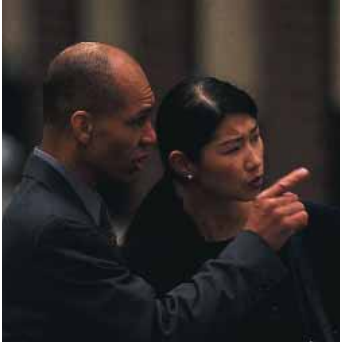
- Systems and Systems Thinking.
- Information systems in modern organisations.
- Types and characteristics of systems.
- Business processes and information systems.
- Customer Relationship Management (CRM) and SCM.
- Collaborative commerce.
- Enterprise systems.
- Organisations and information systems.
- Organisations, procedures, politics and culture.
- Organisational structures and environments.
- The changing role of information systems in organisations.
- Economic and behavioural effects of information systems on organisations.

LO2: Types of Management Information Systems

- Analyse the types of management information systems by level and function:
 - operational level
 - knowledge level
 - management level
 - strategic level.

LO3: The Impact of New Technology on Business Processes and Management Information Systems

- E-commerce, e-business and information systems.
- Internet technology and the digital firm.
- New business models.
- Categories of e-commerce.
- Customer-centred retailing.
- Business-to-Business (B2B).
- E-business and the digital firm.
- Challenges and opportunities of e-commerce.



LO4: The Decision Making Process

- Managing the organisation.
- Models and roles of management.
- Management decision making.
- Process, stages and models of decision making.
- Information systems and business strategy.
- Strategic information systems.
- The value chain model.
- Firm and industry level strategy and information systems.

LO5: Decision Making and Management Information Systems at Different Levels in the Organisation

- Decision Support Systems (DSS).
- Types of DSS.
- Components of a DSS.
- DSS applications.
- Modelling, planning and control.
- Executive support systems (ESS).
- Role, benefits and success factors of ESS.

LO6: Collaborative Decision Making Processes

- Collaborative working.
- Group Decision Support Systems (GDSS).
- Factors for success in enhanced collaborative decision making.

LO7: Knowledge Management

- Knowledge and knowledge management.
- Systems and infrastructure for knowledge management.
- Information and knowledge work systems.
- Enterprise knowledge environments.
- Business intelligence and enterprise reporting and analysis.

LO8: Competitive Advantage as a Driver for Management Information Systems

- Information systems for competitive advantage.
- SCM and ERP.
- Organisational design.
- Business value of information.
- Managing change and implementation.

LO9: Risk, Security and Control Issues

- Systems integrity and risk assessment.
- Information systems security and control.
- Systems vulnerability and abuse.
- Systems quality problems.
- Control environments.
- Internet security challenges.
- Ensuring systems quality.
- Disaster recovery and business continuity planning.

LO10: Professional Issues

- Privacy and how this is managed.
- Intellectual property issues.
- Codes of conduct and professional practice.



RECOMMENDED READING REFERENCES:

Main course text:

Laudon, K C & Laudon, J P (2004)
Management Information Systems – Managing the Digital Firm
(8th Ed.)
Pearson Education
ISBN: 0131206818

Secondary course texts:

Turban, E, McLean, E, & Wetherbe, J (2002)
Information Technology for Management – Transforming the
Business in the Digital Economy (3rd Ed.)
John Wiley & Sons
ISBN: 0471215333

Beynon-Davis, P (2002)
Information Systems – An Introduction in Organisations
Palgrave Macmillan
ISBN: 0333963903

Theme: Management of Information Systems
Course: Higher Diploma
Module Title: Information Systems Strategy
Module Code: H32
Resources: Students should have a working knowledge of the IMIS Code of Ethics and be able to understand and apply the ethical and legal concepts contained therein
Assessment: By a single 3-hour externally set examination paper
CATS Equivalent: 200 Notional Hours: 69 Hours Structured, 131 Hours Directed Self-Study



COURSE AIMS AND LEARNING OUTCOMES:

- H1.1** Evaluate the strategic options available to different business entities and the ways in which the business and information systems strategies can be aligned and integrated.
- H1.2** Evaluate a range of information systems solutions.
- H1.3** Examine the options for establishing and maintaining information systems integrity.
- H4.1** Examine the social and legal impacts of developing and implementing information systems and the role played by Information Systems professionals in addressing such issues.

MODULE AIMS:

To provide students with:

- An in-depth knowledge of the use of information systems to support and promote management decisions in the context of the modern work environment and the ability to apply such knowledge to address management related issues. (A1)
- An understanding and ability to apply appropriate techniques and tools within a given approach to information systems development, taking into account the historical context. (A2)
- An understanding and ability to evaluate and apply appropriate techniques, which achieves successful project management and implementation that is socially desirable and legally compliant. (A3)

MODULE LEARNING OUTCOMES:

Students should be able to:

A1:

- Explain the nature of business strategy. (LO1)
- Explain the nature and significance of innovation as a strategic tool. (LO2)
- Discuss the nature of competitive advantage. (LO3)
- Explain the strategic planning process. (LO4)
- Evaluate an organisation's Information Systems (IS) resources. (LO5)
- Discuss the need for the alignment of IS strategy with business strategy. (LO6)
- Discuss the problem of reconciling organisational structures to strategic aspirations. (LO7)
- Review possible approaches to managing Information Technology (IT) and IS as a strategic resource. (LO8)
- Evaluate the possible financial implications of an IT/IS strategy. (LO9)

A2:

- Review a range of issues associated with systems integrity. (LO10)



- Analyse contemporary views of knowledge management as a strategic tool. (LO11)
- Discuss and evaluate a firm as a learning organisation. (LO12)
- Review strategically important issues of quality management. (LO13)

A3:

- Explain the social and legal dimensions associated with the development and implementation of strategy. (LO14)

DETAILED MODULE CONTENT:

LO1: The Nature of Business Strategy

- Resource analysis.
- Environmental analysis.

LO2: Innovation as a Strategic Tool

- The nature and significance of innovation as a strategic tool.

LO3: The Nature of Competitive Advantage

- IS as a creator of competitive advantage: for example, data warehousing.
- Sustainability of competitive advantage.

LO4: The Strategic Planning Process

- Developing/demonstrating competitive advantage.
- Formulation of options.
- Evaluation of models.
- Limitations of strategic planning.

LO5: Evaluation of an Organisation's IS Resources

- The IT/IS portfolio and its implications.

LO6: Alignment of IS Strategy with Business Strategy

- IT/IS as a change agent.
- Organisational transformation.

LO7: Reconciliation of Organisational Structures to Strategic Aspirations

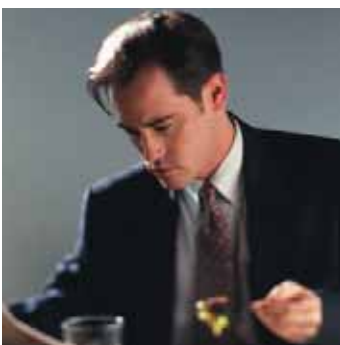
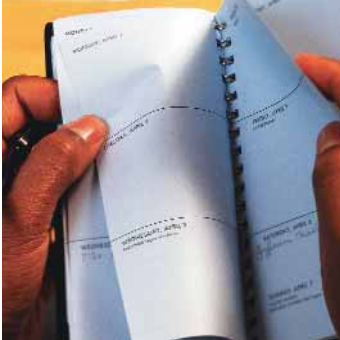
- Centralisation.
- Decentralisation.
- Globalisation (implications for multi-national networks).

LO8: Managing IT/IS as a Strategy Resource

- Cost recovery options:
 - central cost (overhead)
 - service provider
 - profit centre (internal market).

LO9: Financial Implications of an IT/IS Strategy

- Financial assessment of vendors and partners.
- Interpretation of financial statements.
- Investment appraisal and cost of ownership.
- Options for assessing quantitative benefits:
 - discounted cashflows and Net Present Value (NPV)
 - payback



- implementation issues
- funding acquisitions and cost of capital.

LO10: Systems Integrity Issues

- Security.
- Control.
- Implications for employees.

LO11: Knowledge Management

- The nature of knowledge, knowledge management and the strategic implications.

LO12: Organisational Learning

- The firm as a learning organisation.

LO13: Quality Management

- Learning from the gurus.
- Key approaches to understanding quality.
- Implementing and controlling quality management policies.

LO14: Social and Legal Contexts

- Internal issues:
 - Human Resource (HR) management
 - HR issues in project management
 - HR issues in change management.
- External issues:
 - issues of social responsibility: for example, personal profiling
 - legislative issues: for example, data protection.

RECOMMENDED READING REFERENCES:

It is in the nature of strategy that it cannot be "learned by rote" and students should read as widely as possible and in particular texts with case studies and practical examples to complement their studies.

Main course texts:

Ward, J & Peppard, J (2002)

Strategic Planning for Information Systems (3rd Ed.)

John Wiley & Sons

ISBN: 0470841478

Galliers, R & Leidner, D E (2002)

Strategic Information Management (3rd Ed.)

Butterworth-Heinemann

ISBN: 0750656190

Robson, W (1997)

Strategic Management and Information Systems (2nd Ed.)

Pearson Education

ISBN: 0273615912



Theme:	Development of Information Systems
Course:	Higher Diploma
Module Title:	Contemporary IS Development
Module Code:	H33
Resources:	Software: An Object Oriented Programming Language, CASE Tool and SQL compliant database. Students should have a working knowledge of the IMIS Code of Ethics and be able to understand and apply the ethical and legal concepts contained therein
Assessment:	By a single 3-hour externally set examination paper
CATS Equivalent:	200 Notional Hours: 80 Hours Structured, 120 Hours Directed Self-Study

SPECIFIC COURSE AIMS AND LEARNING OUTCOMES:

- H2.1** Model business situations to inform the development process using accepted standards.
- H3.1** Respond to a requirements specification by analysing and designing a contextually relevant solution.
- H4.1** Examine the social and legal impacts of developing and implementing information systems and the role played by Information Systems professionals in addressing such issues.
- H4.2** Determine effective strategies for managing information systems development.

MODULE AIMS:

To provide students with:

- A perspective on the problems in information systems development and their underlying causes, and what can be done to help avoid them. (A1)
- A review of contemporary system development approaches and methodologies. (A2)
- An introduction to the Unified Modeling Language (UML) and the Unified Software Development Process. (A3)
- Knowledge of the fundamental concepts of object orientation, and object-oriented systems development. (A4)
- An introduction to the concept of reusability and the potential for reuse in object-oriented development. (A5)

MODULE LEARNING OUTCOMES:

Students should be able to:

A1:

- Identify problems in information systems development and discuss their underlying causes. (LO1)
- Explain how different approaches and human factors can contribute to the software development process. (LO2)
- Appraise the wider ethical issues associated with information systems development and discuss their implications for computers and computerised information. (LO3)

A2:

- Review methodologies, frameworks and approaches for information systems development. (LO4)



- Discuss the problems of integrating new object-oriented information systems with legacy systems. (LO5)
- Compare hard and soft systems approaches. (LO6)

A3:

- Describe the fundamental concepts in the Unified Software Development Process (USDP). (LO7)
- Describe the support provided by the UML for the software development process. (LO8)

A4:

- Explain the fundamental concepts of object-orientation and the justifications for adopting an object-oriented approach to systems development. (LO9)
- Describe the steps involved in object-oriented analysis. (LO10)
- Describe the steps involved in object-oriented design. (LO11)
- Explain the need for identifying and specifying control in an application, and how to do so using UML statechart diagrams. (LO12)
- Describe the steps involved in moving from design to implementation. (LO13)
- Design, document and implement, using an object-oriented programming language, a relatively simple information system that incorporates a Graphical User Interface (GUI), and the facility for the persistent storage of data from several entities using either a database package or files. (LO14)

A5:

- Discuss issues of reusability in the software development process. (LO15)

DETAILED MODULE CONTENT:

LO1: Problems in IS Development

- Problem perspectives: end-user, client and developer.
- Issues of quality and productivity.

LO2: Development Approaches and Human Factors

- Adopting a project life cycle.
- Benefits from prototyping and incremental development.
- User involvement and roles in projects.

LO3: Ethical Issues

- Consideration of the impact that a new information system will have.
- Project teams and professionalism; ethical behaviour.
- Legislation affecting an information systems development project.

LO4: Methodologies, Frameworks and Approaches

- Methodology for IS development: procedures, techniques, tools and documentation aids.
- Structured methodologies; object-oriented methodologies; the Unified Software Development Process (USDP).
- Dynamic Systems Development Method (DSDM): DSDM and Rapid Application Development (RAD); DSDM life cycle.
- Agile methodologies including Extreme Programming (XP), Test Driven Development, Refactoring.
- Open Source development: Open Source Initiative (OSI), Open Source Definition.



LO5: Legacy Systems

- Problems arising through interaction of systems built using different technologies.
- Integrating new object-oriented systems with non-object-oriented systems: object wrappers; screen scrapers.

LO6: Hard and Soft Systems Approaches

- Participatory Design; soft methodologies (for example, Checkland's Soft Systems Methodology (SSM) and Mumford's Effective Technical and Human Implementation of Computer-based Systems (ETHICS)).
- How hard and soft methodologies differ.
- Combining hard and soft approaches (for example, using SSM as the front-end to a hard systems development approach).

LO7: Unified Software Development Process

- USDP phases: Inception; Elaboration; Construction; Transition.
- USDP disciplines: Business Modelling; Requirements; Design; Implementation; Test; Deployment; Configuration and Change Management; Project Management; Environment.
- Object-oriented analysis; object-oriented design.
- Iterative and incremental development.

LO8: The UML

- What is meant by a model; the distinction between a model and a diagram.
- Diagrams provided in the UML; the concept of a model in the UML.

LO9: Object-Orientation

- Fundamental concepts in an object-oriented approach: abstraction and encapsulation; event-driven systems and message passing; class and instance; object state; relationships between classes; inheritance and polymorphism.
- Benefits and limitations of object-orientation.

LO10: Object-Oriented Analysis

- Use-case driven development; use case realizations.
- Use cases and requirements specification; use case diagrams and use case descriptions.
- Definition of a Domain Model in the USDP; using class diagrams to illustrate a domain model: finding objects and classes; adding attributes to appropriate classes; adding associations; determining multiplicity.
- Attributes and state; link and association.
- Specification by contract.
- Algorithmic and non-algorithmic methods for describing operation logic.

LO11: Object-Oriented Design

- Object interaction and collaboration: developing object collaboration from use cases.
- The UML concepts of collaboration and interaction.
- Using UML sequence and collaboration diagrams to model object collaboration.
- Criteria for good design: coupling; cohesion; designing controller classes; message handling; assigning responsibilities to classes; Class, Responsibility, Collaboration (CRC) cards.
- Specifying classes: attributes, operations, visibility.



- Designing associations and navigability.
- UML interfaces and the realize relationship.
- Designing operations/methods.

LO12: Designing Control using Statecharts

- The notion of control in an application: for example, modelling state dependent variations in behaviour; the relationships between statecharts and other system models.
- Fundamental control concepts: state, event, transition, action; basic UML notation for drawing statecharts.
- Relevant example of constructing a statechart: for example, to model an object lifecycle or a human-computer dialogue.

LO13: Moving to Implementation

- Mapping designs to code: creating class definitions from detailed class diagrams: attribute definitions, method signatures; adding reference attributes; deriving the code for methods from interaction diagrams; implementing container/collection classes in code; adding accessor methods; adding constructors.
- Storing objects in files; serialization.
- Testing in an object-oriented system; unit testing: testing individual classes; integration testing: testing groups of collaborating classes, testing use cases; sub-system testing, system testing; acceptance testing.

LO14: System Building

- Students should design, build and implement a simple system using object-oriented analysis and design methods, starting from a set of system requirements. Note that this is not intended as an exercise in requirements determination, but as an exercise in specifying and constructing a system from a given set of requirements. This will typically involve:
- the production of relevant object-oriented analysis models
- use of a Computer Aided Software Engineering (CASE) tool for at least part of the system building process
- production of an object-oriented design specification to include the following:
 - detailed class diagrams
 - interaction diagrams
 - at least one relevant statechart diagram
- an appropriate user interface design incorporating input/output (I/O) design.
- coding the system and implementing it using an object-oriented programming language.
- Students should be encouraged to build incrementally with the first build dealing with input and output to the screen, the second build dealing with file I/O or database I/O.

LO15: Reusability

- What is reusable software; the arguments for reuse; idea (only) of reusable software components.
- Idea (only) of patterns: reuse in analysis; reuse in design.



RECOMMENDED READING REFERENCES:

Main course text:

Bennett, S McRobb, S & Farmer, R (2002)
Object-Oriented Systems Analysis and Design Using UML
(2nd Ed.)
McGraw-Hill
ISBN: 0077098641

Secondary course text:

Fowler, M (2004)
UML Distilled: A Brief Guide to the Standard Object
Modelling Language
(Object Technology Series) (3rd Ed.)
Addison Wesley
ISBN: 0321193687

Additional reading:

Larman, C (2002)
Applying UML and Patterns: An Introduction to Object-
Oriented Analysis and Design and the Unified Process
(2nd Ed.)
Pearson Education
ISBN: 0130925691

Checkland, P (1999)
Systems Thinking, Systems Practice
John Wiley & Sons
ISBN: 0471986062

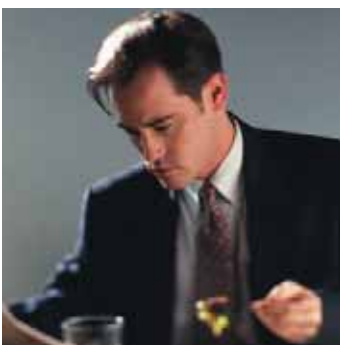
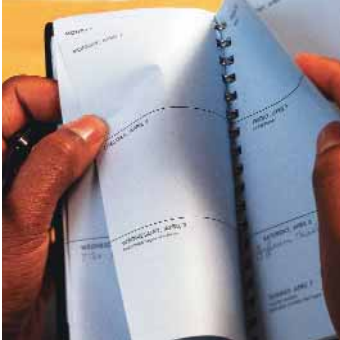
Mumford, E (2003)
Effective System Design and Requirements Analysis
Macmillan
ISBN: 0333639081
URL: <http://www.enid.u-net.com/C1book1.htm>

Britton, C & Doake, J (2000)
Object-Oriented Systems Development: A Gentle
Introduction
McGraw-Hill
ISBN: 0077095448

Brooks, F P (1995)
The Mythical-Man Month (20th Anniversary Edition)
Addison Wesley
ISBN: 0201835959

Booch, G Rumbaugh, J & Jacobson, I (1999)
The Unified Modelling Language User Guide
Addison Wesley
ISBN: 0201571684

Avison, D & Fitzgerald, G (2003)
Information Systems Development: Methodologies,
Techniques, and Tools (3rd Ed.)
McGraw-Hill
ISBN: 0077096266



Theme: Development of Information Systems
Course: Higher Diploma
Module Title: Database Development
Module Code: H34
Resources: Software: CASE Tools, Visual Basic (at least V6), and Access Students should have a working knowledge of the IMIS Code of Ethics and be able to understand and apply the ethical and legal concepts contained therein
Assessment: By a single 3-hour externally set examination paper
CATS Equivalent: 200 Notional Hours: 80 Hours Structured, 120 Hours Directed Self-Study

SPECIFIC COURSE AIMS AND LEARNING OUTCOMES:

- H2.1** Model business situations to inform the development process using accepted standards.
- H3.1** Respond to a requirements specification by analysing and designing a contextually relevant solution.
- H4.1** Examine the social and legal impacts of developing and implementing information systems and the role played by Information Systems professionals in addressing such issues.

MODULE AIMS:

To provide students with:

- An awareness of the need for a database system, its role in an organisation and the standard Database Management System (DBMS) architecture. (A1)
- An insight into the Database Management System (DBMS) functions and how the components interact to produce high-quality data management. (A2)
- Skills to analyse database requirements and design well-structured logical database designs using appropriate methodologies. (A3)
- Skills to produce physical implementations supporting business functions and the management of data integrity using a suitable relational DBMS. (A4)
- Ability to understand the need for a database programming language and using the Structured Query Language (SQL) to define database structures, maintain data integrity and manipulate corporate data. (A5)
- An understanding of physical database design concepts. (A6)
- An appreciation of the techniques available to provide effective user interfaces to database systems. (A7)
- An understanding of the need for distributed processing, distributed databases and client-server architectures in a multi-user environment. (A8)
- An appreciation of internet and web-enabled database technologies. (A9)
- The ability to evaluate the legal, ethical and social issues of storing large amounts of data and various security techniques employed to ensure that it is used appropriately. (A10)

MODULE LEARNING OUTCOMES:

Students should be able to:

A1:

- Review traditional file processing systems and show their limitations. (LO1)



- Explain the benefits of a Database Management System (DBMS) in an organisation. (LO2)
- Understand the purpose and origin of the three-level architecture of a Database Management System (DBMS). (LO3)
- Understand the meaning of logical and physical data independence. (LO4)

A2:

- Review typical functions and services provided by a Database Management System (DBMS) and how these functions support business operations of an organisation. (LO5)
- Appreciate the role of a system catalogue or data dictionary. (LO6)

A3:

- Appreciate the purpose and importance of conceptual modelling using Entity-Relationship Diagrams. (LO7)
- Appreciate the importance of a data model and have an overview of previous generations of database models. (LO8)
- Explain the link between mathematical set theory and the relational data model (LO9)
- Understand the basic properties of the relational data model. (LO10)
- Map the basic Entity-Relationship Diagram (ERD) into a relational schema. (LO11)
- Understand the concept of functional dependency, attributes groupings and the process of normalisation. (LO12)

A4:

- Implement the physical relational schema with its identified business rules and data constraints using the Structured Query Language (SQL). (LO13)

A5:

- Write simple queries using various data manipulation operators in SQL. (LO14)

A6:

- Understand the different file organisation techniques and the importance of physical database design. (LO15)

A7:

- Understand various techniques for user interface design and be able to apply the appropriate tools available in a Relational Database Management System (RDBMS) such as Query By Example (QBE). (LO16)

A8:

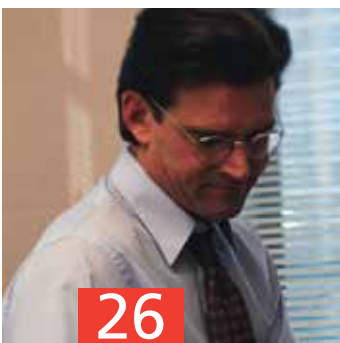
- Appreciate the importance of data distribution in modern organisations to meet current applications' requirements using appropriate distribution techniques and various client-server architectures. (LO17)

A9:

- Realise recent developments in web technolog/ies and their impacts on database applications. (LO18)

A10:

- Review techniques used to ensure protection and correct usage of database data in an organisation and explain different security mechanisms in a database environment. (LO19)
- Understand the role of a database administrator in enforcing an organisation's policy and appreciate the social impact on individuals in a society. (LO20)



DETAILED MODULE CONTENT:

LO1: Review traditional file processing systems and show their limitations.

- Database terminologies.
- Traditional file system vs. a database approach.

LO2: Explain the benefits of a Database Management System (DBMS) in an organisation.

- Advantages and disadvantages of DBMS.
- When is it not necessary to use a DBMS?

LO3: Understand the purpose and origin of the three-level architecture of a Database Management System (DBMS).

- Three level ANSI-SPARC architecture.
- The contents of the external, conceptual and internal levels.
- The purpose of the external/conceptual and the conceptual/internal mappings.

LO4: Understand the meaning of logical and physical data independence.

- Concept of data independence.
- Logical data independence.
- Physical data independence.
- Mapping between external/conceptual and the conceptual/internal schemas.

LO5: Review typical functions and services provided by a DBMS and how these functions support business operations of an organisation.

- Functions of a DBMS.
- Components of a DBMS.
- Multi-user DBMS Architecture.

LO6: Appreciate the role of a system catalogue or data dictionary.

- Integrated system catalogue.
- Metadata and its importance in a database environment.

LO7: Appreciate the purpose and importance of conceptual modelling using Entity-Relationship Diagrams.

- Lifecycle of database system development.
- Understand business functions in an organisation through various data analysis techniques: Fact finding techniques.
- Importance of conceptual modelling.
- Tools for conceptual modelling: Basic constructs in Entity-Relationship Diagram (ERD).
- Specify data and user requirements in terms of business rules of an organisation.
- Translating business rules into ERD constructs.

LO8: Appreciate the importance of a data model and have an overview of previous generations of database models.

- The role of a data model.
- Hierarchical model.
- Network model.
- Object-oriented data model.

LO9: Explain the link between mathematical set theory and the relational model.

- Mathematical set theory.
- Relational operators.



LO10: Understand the basic properties of the relational data model.

- Basic concepts of a relation.
- Properties of a relation.
- Primary and foreign keys.
- Relational constraints (entity integrity, referential integrity and business constraints).

LO11: Map the basic Entity-Relationship Diagram into a relational schema.

- Steps of translating an ERD into a relational schema.

LO12: Understand the concept of functional dependency, attribute groupings and the process of normalisation.

- Concepts of functional dependencies.
- Partial and full functional dependency.
- Anomalies in unstructured relations.
- First, Second and Third Normal Forms.

LO13: Implement the physical relational schema with its identified business rules and data constraints using the Structured Query Language (SQL).

- Basic SQL definition statements.
- Data Definition Language.

LO14: Write simple queries using various data manipulation operators in SQL.

- Data Manipulation Language.
- Data Manipulation Operators.

LO15: Understand the different file organisation techniques and the importance of physical database design.

- Storage structures and blocking.
- Unordered files.
- Sequential files.
- Indexing.

LO16: Understand various techniques for user interface design and be able to apply the appropriate tools available in a Relational Database Management System (RDBMS) such as Query By Example (QBE).

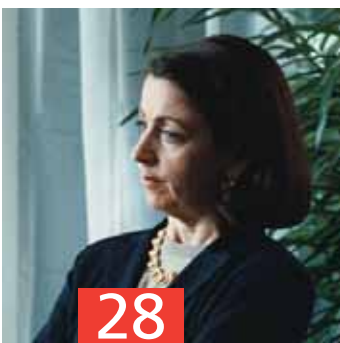
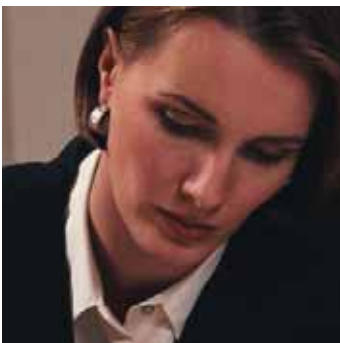
- Basic features of QBE interface.
- Advantages and limitations of QBE.
- Graphical User Interface (GUI) design criteria.
- Criteria for designing forms and reports.
- Primary data validation on forms.

LO17: Appreciate the importance for data distribution in modern organisations to meet current applications' requirements using appropriate distribution techniques and various client-server architectures.

- Need for distributing data in an organisation.
- Approaches to data distribution.
- Business and technological imperatives.
- Client-server architectures.
- The role of Middleware in a client-server architecture.

LO18: Realise recent developments in web technologies and their impacts on database applications.

- The importance of integrating internet technologies into the economic infrastructure of the business.



- Advantages and disadvantages of the web-enabled database approach.
- The web as a database application platform for business.

LO19: Review techniques used to ensure protection and correct usage of database data in an organisation and explain different security mechanisms in a database environment.

- Concepts of database integrity.
- Explain the properties of a transaction and locking mechanisms:
 - concept of a transaction
 - properties of a transaction
 - locking mechanisms.
- Importance of security in an organisation.
- The database environment and security levels.

LO20: Understand the role of a database administrator in enforcing an organisation's policy and appreciate the social impact on individuals in a society.

- Compliance with Data Protection Acts.
- Corporate policies and code of conduct.
- Implications of Data Protection Act for database design.
- Legal impact on individuals.
- Social impact on society.

RECOMMENDED READING REFERENCES:

Main course text:

Connolly, T & Begg, C (2002)
Database Systems - A Practical Approach to Design,
Implementation and Management (3rd Ed.)
Addison Wesley
ISBN: 0201708574

Secondary course text:

Elmasri, Ramez & Navathe, Shamkant B (2004)
Fundamentals of Database Systems (4th Ed.)
Addison Wesley
ISBN: 0321122267
URL: <http://www.aw-bc.com/catalog/academic/product/0,4096,0321122267,00.html>

Additional reading:

Date, C J (2004)
Introduction to Database Systems, An, (8th Ed.)
Addison Wesley
ISBN: 0321197844
URL: <http://www.aw-bc.com/catalog/academic/product/0,1144,0321197844,00.html>



Ramakrishnan & Gehrke (2003)
Database Management Systems (3rd Ed.)
McGraw-Hill
ISBN: 0072465638
URL: <http://highered.mcgraw-hill.com/sites/0072465638/>

Rob, P & Coronel, C (2004)
Database Systems (6th Ed.)
Thomson Learning
ISBN: 0619213728
URL: <http://www.bookfinder.us/review1/061906269X.html>

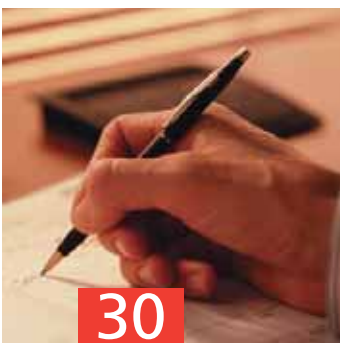
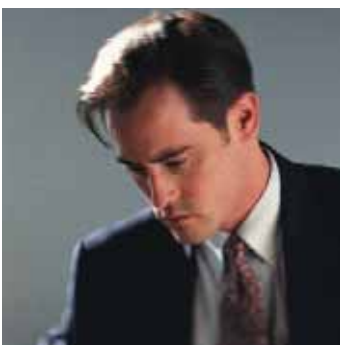
Silberschatz, Korth & Sudarshan (2001)
Database System Concepts (4th Ed.)
McGraw-Hill
ISBN: 0072554819
URL: <http://www.cs.yale.edu/homes/avi/db-book/>

Useful web sites:

Database Place, Addison Wesley's online resource for introductory database courses:
URL: <http://www.aw-bc.com/databaseplace/>

WBT-Master: Electronic Book on DB:
URL: <http://coronet.iicm.edu/wbtmaster/master.htm>

www.oracle.com
www.dbdebunk.com
www.sqlcourse.com



Theme: People Issues
Course: Higher Diploma
Module Title: Project Management
Module Code: H35
Resources: Project Management Tool
 Access to the SoDIS Project Auditor Software
 Students should have a working knowledge of the IMIS Code of Ethics and be able to understand and apply the ethical and legal concepts contained therein
Assessment: By a single 3-hour externally set examination paper
CATS Equivalent: 200 Notional Hours: 80 Hours Structured, 120 Hours Directed Self-Study

SPECIFIC COURSE AIMS AND LEARNING OUTCOMES:

- H4.1** Examine the social and legal impacts of developing and implementing information systems and the role played by Information Systems professionals in addressing such issues.
- H4.2** Determine effective strategies for managing information systems development.

MODULE AIMS:

To provide students with:

- An understanding of what is involved in managing change brought about through the introduction of an information system (IS). (A1)
- Knowledge of the nature of an information systems development project. (A2)
- Knowledge of the essential project planning and control techniques. (A3)
- An understanding of the potential risks associated with information systems development and implementation. (A4)
- An understanding of people management within the context of an information systems development project. (A5)
- An appreciation of the relationships with suppliers and clients. (A6)

MODULE LEARNING OUTCOMES:

Students should be able to:

A1:

- Recognise the reasons for change and the associated potential resistance. (LO1)
- Explain how change might be managed. (LO2)

A2:

- Explain the organisational context and nature of information systems development projects. (LO3)

A3:

- Analyse a project resulting in an effective project plan. (LO4)
- Review the progress and quality of project activities resulting in effective project control. (LO5)

**A4:**

- Evaluate the risks associated with an information systems development project. (LO6)
- Discuss appropriate risk management strategies. (LO7)

A5:

- Discuss the key features of project leadership. (LO8)
- Review the available options for project team composition. (LO9)
- Appraise project team member performance. (LO10)

A6:

- Discuss the relationship between the project and suppliers. (LO11)
- Discuss the expectations of and delivery to project clients. (LO12)

DETAILED MODULE CONTENT:**LO1: Reasons for Change**

- Organisational change and culture.
- Systems obsolescence.
- Resistance to change.

LO2: Change Management

- Project launch.
- User education.
- Post implementation support.

LO3: Organisational Context of IS Development

- Link between projects and business and IS strategies.
- Types of projects.
- Project roles and responsibilities.
- Project process.

LO4: The Project Plan

- Work breakdown structures.
- Project networks:
 - activity-on-node diagrams.
- Bar charts.
- Estimating.
- Scheduling:
 - effort and elapsed time.
- Project budgets.

LO5: Project Progress and Control

- Monitoring:
 - effort
 - cost.
- Corrective action.
- Quality control.

LO6: Risks of IS Development

- Risk appraisal.
- Social impact audit.

LO7: Risk Management Strategies

- Risk management.

LO8: Key Features of Project Leadership

- Motivation.
- Delegation.
- Leadership.



LO9: Project Team Composition

- Project team members.
- Job descriptions and person specifications.
- Teamwork.

LO10: Team Performance Appraisal

- Setting performance targets.
- Reviewing performance.
- Performance improvement strategies.

LO11: Supplier Relationships

- Role and format of contracts.

LO12: Project Expectations and Delivery

- Client expectations.
- Conflict.
- Customer management.

RECOMMENDED READING REFERENCES:

Main course text:

Cadle, J & Yeates, D (2001)
Project Management for Information Systems (3rd Ed.)
Pearson Education
ISBN: 0273651455

Additional reading:

Hughes, R & Cotterell, M (2002)
Software Project Management (3rd Ed.)
McGraw-Hill
ISBN: 007709834X

Bynum, T W & Rogerson, S (2004)
Computer Ethics and Professional Responsibility
Blackwell Publishing
ISBN: 1855548453

Thompson, N (2002)
People Skills (2nd Ed.)
Palgrave Macmillan
ISBN: 0333987462



Theme:	Embracing all Four Themes
Course:	Higher Diploma
Module Title:	Business Information Systems Project
Module Code:	H36
Resources:	Software: CASE Tools, Visual Basic (at least V6), Access, Project Management Tool. Students should have a working knowledge of the IMIS Code of Ethics and be able to understand and apply the ethical and legal concepts contained therein
Project Time:	200 Notional Hours – 50 hours guidance, 150 hours project development
Module Aim:	Students will be expected to analyse a business problem, plan, design, test, and implement a suitable solution. A social audit and legal compliance check will be required.
Prerequisites	Other modules need to be completed before to attempting this module. However, module can be taught in parallel with Information Systems Strategy and Database Development.

SPECIFIC COURSE AIMS AND LEARNING OUTCOMES:

- H1.1** Evaluate the strategic options available to different business entities and the ways in which the business and information systems strategies can be aligned and integrated.
- H1.2** Evaluate a range of information systems solutions.
- H1.3** Examine the options for establishing and maintaining information systems integrity.
- H2.1** Model business situations to inform the development process using accepted standards.
- H3.1** Respond to a requirements specification by analysing and designing a contextually relevant solution.
- H4.1** Examine the social and legal impacts of developing and implementing information systems and the role played by Information Systems professionals in addressing such issues.
- H4.2** Determine effective strategies for managing information systems development.

MODULE AIMS:

- To develop a student's ability to plan, organise and work independently on, a selected problem, drawing on and extending ideas encountered in other study modules. (A1)
- To provide the student with the opportunity to analyse a business problem and to specify, design, implement and test a software solution to an appropriate level of professional competence. (A2)
- To develop the student's ability to communicate the work carried out, through means of a written report and a software demonstration. (A3)

MODULE LEARNING OUTCOMES:

Students should be able to:

A1:

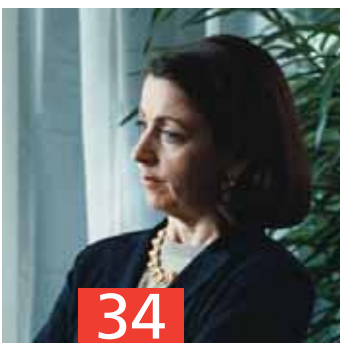
- Assess the scope and feasibility of a project requiring at least 150 hours of individual effort, to develop a cost-effective Information Technology (IT) solution to a business project. (LO1)
- Use basic project management techniques to plan, organise, schedule and control their project. (LO2)

A2:

- Review, select and employ relevant modelling methods and techniques within an appropriate development process to design, build and test a software product. (LO3)
- Adopt a professional approach towards all aspects of an IT project. (LO4)

A3:

- Produce a report to a professional standard, commensurate with the level of the programme of study, which describes the development process and the product, and includes technical documentation for the product. (LO5)
- Prepare and give a short presentation on a completed project and demonstrate the software produced. (LO6)



DETAILED MODULE CONTENT:

LO1: Selecting and Defining a Project

- Choice of project topic and identification of a relevant business project.
- Definition of the problem and specification of a set of high-level objectives for the project.
- Definition of the scope of the project in terms of its size and complexity.
- Specification of a body of work that can be carried out and completed in the time available.

LO2: Project Management

- Production of a project plan.
- Identification of the main stages and milestones of the project.
- Decomposition of stages into work products.
- Identification of manageable chunks of work (manageable means 'can be achieved within 2 or 3 weeks').
- Task analysis: identify tasks, estimate their duration, place them into an overall sequence of project tasks; and identify dependencies between tasks.
- Simple project management tools and techniques and diagrammatic representation: for example, work breakdown structures, task tables, Gantt Charts.

LO3: System Development Approaches and Methods

- Review and selection of an appropriate set of methods, i.e. a methodology, for carrying out analysis, design and implementation.



- Review and selection of a development strategy: for example, the linear sequential model - sometimes called the waterfall model; the prototyping model; the Rapid Application Development (RAD) model; the evolutionary model; the incremental model; the spiral model.
- Map of the stages, activities and deliverables of the project onto the selected development strategy.
- Review and selection of development tools.
- Technical solution adopted: for example, hardware/software choices; software architecture.
- Documentation of software.
- Build decisions: for example, bespoke software; application packages, code generator.
- Test plan: what is to be tested; testing strategies: how testing is to be carried out; test data, test output.

LO4: Professional Approach

- Adopting an engineering approach: undertaking investigation; selecting and applying methods in a disciplined manner; validating work; assessing risk and managing the work; using a disciplined approach to implementation; applying quality assurance techniques.
- Social, ethical and legal concepts.
- Professional codes of conduct: the IMIS Code of Ethics.

LO5: Project Report

- Writing-up scholarly work; distinction between a dissertation and a report for managerial consumption.
- Writing, structuring and formatting a report for an academic project.
- Reflection on the development work carried out.
- Appraisal of the end product.
- Commentary on lessons learnt over the duration of the project.
- Technical documentation.

LO6: Product Demonstrations

- Oral presentations.
- Software demonstrations.

RECOMMENDED READING REFERENCES:

Main course text:

Weaver, P (2004)
Success in Your Project: A Guide to Student System
Development Projects
Pearson Education
ISBN: 0273678094

Secondary course text:

Dawson, C W (2000)
The Essence of Computing Projects: A Student's Guide
Pearson Education
ISBN: 013021972X



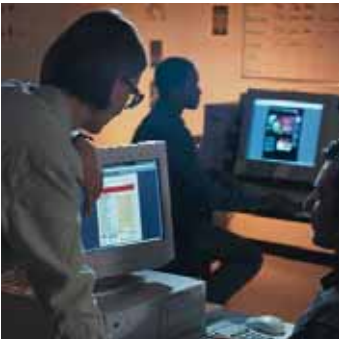
Additional reading:

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Pearson Education
ISBN: 0273651455



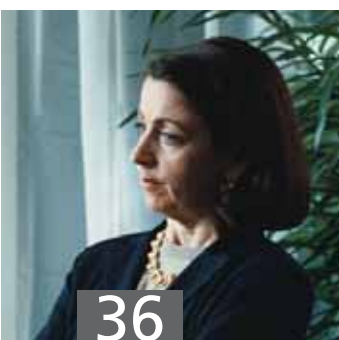
Rudestam, K E & Newton, R R (2001)
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Sage Publications
ISBN: 0761919619 hardback / 0761919627 paperback

Ricketts, I W (1998)
Managing Your Software Project: A Student's Guide
Springer-Verlag Berlin and Heidelberg
ISBN: 3540760466



Fairbairn, G J & Winch, C (1996)
Reading, Writing and Reasoning: A Guide for Students
(2nd Ed.)
Open University Press
ISBN: 0335197418 hardback / 033519740X paperback

<http://www.ccc.commnet.edu/grammar/>







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IMIS

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