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DEPARTMENT OF INFORMATION TECHNOLOGY
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POSTGRADUATE DIPLOMA IN INFORMATION TECHNOLOGY (PGDIT) PROGRAMME

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(DAY / EVENING PROGRAMME)

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Postgraduate Diploma in Information Technology

1. Background to the Postgraduate Diploma in Information Technology Programme

Modern business is shaped by technological change, competitiveness and globalization. In many organizations, Information Technology (IT) is the strategic asset, which drives competitiveness and supports alliances and partnerships. The Postgraduate Diploma in Information Technology (PGDIT) is a one year day / evening programme open to all prospective students. This programme was first launched in August 2005. The programme offers flexibility while providing the level of knowledge and skills required by industry and professional bodies. This programme focuses on IT Management and Security, as well as Internet and Web Computing.

The Postgraduate Diploma in Information Technology (PGDIT) programme is offered to give an opportunity to prospective students to undertake training in Information Technology (IT) at a Postgraduate Diploma level. This programme also provides an avenue to those already engaged in the IT-sector without Postgraduate Diploma qualifications in IT to join the programme. Since Information Technology is a vibrant and growing discipline in Uganda currently, this programme will provide a pool of highly qualified IT Professionals that are much needed in today's IT industry. PGDIT graduates will have the opportunity to join the Master of Information Technology in the 2nd year of study upon fulfilling the requisite requirements.

The **objectives** of the programme are to: -

1. Build IT human resource capacity in both the public and private sectors, especially in universities;
2. Develop professionals with theoretical and practical skills in the Information Technology (IT) sector;
3. Address the increasing demand for IT training at Postgraduate Diploma level;
4. Strengthen capacity and institutional building in the IT discipline in tertiary institutions, private and public sectors.

2. The Programme

2.1. Target group

For the foreseeable future, it is anticipated that PGDIT program will continue to attract students with a wide range of backgrounds. In traditional graduate programmes, it is assumed that entering students have a common background obtained through an undergraduate degree in that field. The PGDIT programme may also attract experienced individuals including IT professionals and people seeking career changes. The architecture of the PGDIT programme accommodates this wide diversity of backgrounds and learning environments. Specifically, the PGDIT programme is appropriate for:

- New graduates with degrees in Information technology, information systems, computer science, software engineering, computer engineering, business degrees; and other bachelor degrees in a range of fields including the humanities, social science, engineering, and physical science with evidence of having taken acceptable courses in information technology.
- Experienced IT professionals seeking to upgrade skills and to understand management issues
- Experienced management professionals seeking skills in managing technology

2.2. Admission Requirements

To qualify for admission, a candidate must fulfill the general Makerere University entry requirements for a postgraduate diploma, and in addition a candidate must be a holder of either:

- a. A bachelor's degree in Information Technology, Information Systems, Computer Science, Software Engineering and computer engineering from a recognized University/Institution; **Or**
- b. Any other degree with evidence of having taken acceptable courses in Information Technology.

2.3. Nature of the Programme

This is a day / evening programme that is completely privately sponsored.

2.4. Study Plan

Students under the PGDIT course will be required to take two semesters of course work at the end of which they will be required to do a project.

2.5. Duration

The duration for the Postgraduate Diploma in Information Technology (PGDIT) programme is one (1) academic year comprising of 2 semesters and a Recess Term.

2.6. Tuition Fees

Tuition fees payable by the students will enable the University sustain the program. Ugandan students will pay tuition fees totaling to Three Million Eight Hundred Twenty Five Thousand shillings (3,825,000/=) for the duration of the programme or Ugandan Shillings 6,767,000 for International students.

3. Regulations

The general regulations for Postgraduate programmes of Makerere University shall apply and these shall also include:

- Applications, registration, academic integrity, examination, research proposal writing and supervision;
- Guidelines for submission of final dissertation/project report shall apply.

3.1. Course Assessments

a) Each Course will be assessed on the basis of 100 total marks with proportions as follows:

Coursework – 40; and

Examination – 60

b) A minimum of two course assignments/tests shall be required per course.

c) Course work shall consist of tests, group assignments and presentations in each semester. At the end of the course, assessment shall also include the evaluation of individual research projects.

3.2. Grading of Courses

a) Each Course will be graded out of a maximum of 100 marks and assigned an appropriate letter grade and a grade point as follows:

MARKS %	LETTER GRADE	GRADE POINT	INTERPRETATION
90 - 100	A+	5.0	Exceptional
80 - 89	A	5.0	Excellent
75 - 79	B+	4.5	Very good
70 - 74	B	4.0	Good
65 - 69	C+	3.5	Fairly good
60 - 64	C	3.0	Pass
55 - 59	D+	2.5	Marginal Fail
50 - 54	D	2.0	Clear Fail
45 - 49	E	1.5	Bad Fail
40 - 44	E-	1.0	Qualified Fail

Below 40

F

0.0

Qualified Fail

b) The following additional letters will be used, where appropriate: -

- W - Withdraw from Course;
- I - Incomplete;
- AU - Audited Course Only;
- P - Pass;
- F - Failure.

3.3. Minimum Pass Mark

A minimum pass grade for each course shall be 3.0 grade points.

3.4 Calculation of Cumulative Grade Point Average (CGPA)

The CGPA shall be calculated as follows: -

$$CGPA = \sum_{i=1}^n \frac{(GP_i \times CU_i)}{CU_i}$$

Where GP_i is the Grade Point score of a particular course i ;

CU_i is the number of Credit Units of course i ; and

n is the number of courses so far done.

3.5. Progression

Progression through the programme shall be assessed in three ways:

3.5.1. Normal Progress

This occurs when a student passes each course taken with a minimum Grade Point of 3.0.

3.5.2. Probationary

This is a warning stage and occurs if either the cumulative grade point average (CGPA) is less than 3.0 and/or the student has failed a core course. Probation is waved when these conditions cease to hold.

3.5.3. Discontinuation

When a student accumulates three consecutive probationarys based on the CGPA or the same core course(s), he/she shall be discontinued. A student who has failed to obtain at least the pass mark (60%)/ grade point of 3.0 during the third assessment in the same course(s) he/she had retaken

shall be discontinued from his/her studies at the University. A student who has overstayed in an academic programme by more than two (2) years shall be discontinued from his /her studies at the university.

3.5.4. Re-taking a Course

A Student may re-take any course when it is offered again in order to pass if the student had failed the course. A Student may take a substitute elective, where the Student does not wish to re-take a failed elective.

3.6. Weighting System

The weighting unit is the Credit Unit (CU). The Credit Unit is 15 contact hours per semester. A contact hour is equal to (i) one lecture hour, (ii) two practical hours or (iii) two tutorial hours

3.7. PGDIT Project

Students are required to demonstrate their ability to independently formulate a detailed project proposal, as well as develop and demonstrate their project thoroughly.

- a. A candidate shall submit a project proposal to the Faculty of Computing and IT, Higher Degrees and Graduate Research Committee during the second semester.
- b. The candidate shall execute the project during the recess term.
- c. A candidate shall be assigned a supervisor who is a specialist in the candidate's field of study to undertake supervision of the project.
- d. The candidate shall submit the project report by the end of the recess term.

3.7.1. Passing of a Project

To pass the Project, the candidate shall satisfy the examiners in a written report and viva voce independently.

3.7.2. Revised Project Report

A candidate, who fails to satisfy the examiners, shall re-submit a Revised Project Report in accordance with the standing University guidelines for the project examinations.

3.8. Minimum Graduation Load

To qualify for the award of the Postgraduate Diploma in Information Technology, a full-time candidate is required to obtain a minimum of 29 credit units for courses passed including all the compulsory courses; and the postgraduate diploma project - 5CU within a period stipulated by the School of Graduate Studies, usually not exceeding five (3) years from the date of registration.

3.9. Knowledge Areas Covered in the Program

The curriculum is based on 4 broad knowledge areas that make up practical and resourceful Information Technology specialists. These are:-

1. IT Management
2. IT Security
3. Internet and Web Computing
4. Multimedia Technologies
5. Research and Development

3.10 Content Distribution by Knowledge Area

Below is a summary of the distribution of the different course units in the different knowledge areas:-

- IT Security (ITS)
 - MIT 7100 Information Security
 - MIT 7214 Audit and Security Assurance Principles

- Internet and Web Computing (IWC)
 - MIT 7216 E-Service Delivery
 - MIT 7217 Web Design and Usability

- IT Management (ITM)
 - MIS 7100 Systems Analysis and Design
 - MIS 7110 Database Systems
 - MIT 7115 Contemporary Issues in Information Technology
 - MIS 7209 Project and Organization Change Management
 - MIT 7215 IT Strategic Planning and Management

- Research and Development (RD)
 - MIT 7116 Research Methodology
 - MCS 7226 Seminar Series
 - MIT 7218 Legal & Ethical Aspects of Computing

4. The Curriculum for Postgraduate Diploma in Information Technology

SEMESTER I						
Code	Name	LH	PH	TH	CH	CU
MIT 7100	Information Security	45	-	-	45	3
MIS 7110	Database Systems	30	30	-	45	3
MIS 7100	Systems Analysis and Design	30	30	-	45	3
MIT 7115	Contemporary Issues in Information Technology	45	-	-	45	3
MIT 7116	Research Methodology	30	30	-	45	3
SEMESTER II						
MIS 7209	Project and Organization Change Management	45	-	-	45	3
MIT 7214	Audit and Security Assurance Principles	45	-	-	45	3
MIT 7215	IT Strategic Planning and Management	45	-	-	45	3
MIT 7216	E-Service delivery	45	-	-	45	3
MIT 7217	Web Design and Usability	30	30	-	45	3
MIT 7218	Legal & Ethical Aspects of Computing	45	-	-	45	3
MCS 7226	Seminar Series	-	60	-	30	2
Recess Term						
PGD 6307	PGD Project in Information Technology	-	300	-	-	5

Under the Postgraduate Diploma in Information Technology Programme, students are allowed to major in one of the two following areas namely **IT Management and Security Option** and **Internet and Web Computing Option**. Each of these options is described as follows:

4.1. Course Options

4.1.1. Information Technology Management and Security Option

From the **IT Management** perspective, most managers feel that the critical asset that separates their organization from their competitors is the knowledge assets or intellectual capital of the employees of their organization. With many organizations rightsizing, outsourcing, and the like, the ability to capture, share, and apply the 'lessons learned' of the employees (especially those experts who retire or leave the firm) is critical to success and growth of the organization. Modern

management requires an awareness of information technologies in order to remain competitive. Information systems influence the way in which the whole organization operates dealing with work practices, products, tools for decision support, marketing and sales, and many other areas of business, which are critical to the efficient running, and operation of any enterprise. On the other hand, the **IT Security** viewpoint emphasizes on the electronic handling of information as one of the defining technologies of our age. This means that the Information Security area addresses the rapidly growing global problems of maintaining and securing computer information. Enormous volumes of information are routinely stored and transmitted worldwide, indeed most aspects of our daily lives would come to a halt should the information infrastructure fail. However, with the benefits deriving from the ability to automatically manage so much information, they come with major threats to business, governments and individuals. The field of information security, namely the study of countermeasures to these real and serious threats has grown up rapidly in recent years. Important areas addressed include threats and vulnerabilities, cryptography, authentication and access control, security models, computer security, network security, fault detection, trusted computer systems, distributed systems security, World Wide Web security, applications security, and security management and policies.

Therefore the aim of the Information Technology Management and Security specialization is to prepare IT professionals for a position of responsibility in this demanding new world of IT management and security. The specific research areas of IT Management include IT Project Management; IT Strategic Planning; Information Management; Corporate Network Management; Information Security Management; Strategic Information Systems Management; Information Systems for Managers; Managing People in IT Environments; IT Architecture; Web-based Information Systems; and Web Mining Technologies. While the specific research areas for IT Security include information security policy, privacy and ethics; information security strategies and risk management; security assurance principles; encryption and authentication systems; information security management; computer information systems audit; computer security; network security; database security and secure computer systems.

4.1.2. Internet and Web Computing Option

This option entails two themes. The first theme focuses on **internet and service delivery** in which the foresight of information technology in governmental, public and private sectors online service delivery is described. The specific research areas in this theme include E-service Delivery; Online Information Services; Organizational Issues in IT; Web Design and Usability Issues; Internet Technologies; E-governance; E-Commerce; E-Business; Security, Risk Management and Control

in E-Commerce. The second theme is on **internet and web computing** in which students will follow an in depth hands on approach to software-oriented Internet and web-based computing. The specific research areas include Internet Programming; Server-Side Development of E-Commerce Applications; Multi-Media and Immerging Technologies; Web Database Applications; Network and Distributed Systems Programming; Enterprise Wide Computing; and Interaction Design.

4.2. Postgraduate Diploma in Information Technology: IT Management and Security Option

4.2.1. Course outline

Semester I (5 Courses)

Code	Name	LH	PH	TH	CH	CU
Core: - (5 core courses)						
MIT 7100	Information Security	45	-	-	45	3
MIS 7110	Database Systems	30	30	-	45	3
MIS 7100	Systems Analysis and Design	30	30	-	45	3
MIT 7115	Contemporary Issues in Information Technology	45	-	-	45	3
MIT 7116	Research Methodology	30	30	-	45	3
Total CU						15

Semester II (5 Courses)

Code	Name	LH	PH	TH	CH	CU
Core: - (4 core courses)						
MIS 7209	Project & Organization Change Management	45	-	-	45	3
MIT 7214	Audit and Security Assurance Principles	45	-	-	45	3
MIT 7215	IT Strategic Planning and Management	45	-	-	45	3
MCS 7226	Seminar Series	-	60	-	30	2
Electives: - (1 elective course)						
MIT 7216	E-Service delivery	45	-	-	45	3
MIT 7217	Web Design and Usability	30	30	-	45	3
MIT 7218	Legal & Ethical Aspects of Computing	45	-	-	45	3
Total CU						14

Recess Term

Code	Name	LH	PH	TH	CH	CU
PGD 6307	PGD Project in Information Technology	-	300	-	-	5
Total CU						5

4.3. Postgraduate Diploma in Information Technology: Internet and Web Computing Option

4.3.1. Course outline

Semester I (5 Courses)

Code	Name	LH	PH	TH	CH	CU
Core: - (5 core courses)						
MIT 7100	Information Security	45	-	-	45	3
MIS 7100	Systems Analysis & Design	45	-	-	45	3
MIS 7110	Database Systems	30	30	-	45	3
MIT 7115	Contemporary Issues in Information Technology	45	-	-	45	3
MIT 7116	Research Methodology	30	30	-	45	3
Total CU						15

Semester II (5 Courses)

Code	Name	LH	PH	TH	CH	CU
Core: - (4 core courses)						
MIS 7209	Project and Organization Change Management	45	-	-	45	3
MIT 7216	E-Service Delivery	45	-	-	45	3
MIT 7217	Web Design and Usability	30	-	-	45	3
MCS 7226	Seminar Series	30	-	-	30	2
Electives: - (1 elective course)						
MIT 7214	Audit and Security Assurance Principles	45	-	-	45	3
MIT 7215	IT Strategic Planning and Management	45	-	-	45	3
MIT 7218	Legal & Ethical Aspects of Computing	45	-	-	45	3
Total CU						14

Recess Term

Code	Name	LH	PH	TH	CH	CU
PGD 6307	PGD Project in Information Technology	-	300	-	-	5
Total CU						5

5. Detailed Curriculum

5.1. Semester I

MIT 7100 Information Security (3 CU)

- (a) **Course Description:** This course unit addresses the issues and problems involved in securing information and services provided via the Internet with particular reference to the World Wide Web. It exposes students from a variety of backgrounds, to the technical aspects of information confidentiality, integrity, availability; authentication models; protection models; security kernels; secure programming; audit; intrusion detection and response; operational security issues; physical security issues; personnel security; policy formation and enforcement; access controls; information flow; legal and social issues; identification and authentication in local and distributed systems; classification and trust modeling; risk assessment.
- (b) **Aims:** The course aims to introduce students to the issues of Information Security, countermeasures to the threat of information infrastructure and failure to ensure the security of electronic information. It embraces a range of technologies such as cryptography, computer security, and fraud detection, and also includes the study of how security can best be managed. The program also aims to introduce the technical, legal and commercial aspects of Information Security. Students are from a variety of backgrounds, ranging from new graduates through to senior security managers in enterprises seeking a formal qualification in Information Security.
- (c) **Learning outcomes:** At the end of this course unit, the students will be able to demonstrate understanding of the principles and practice associated with:

- Cryptography: Cipher methods, Single key vs. Public Key, Role of security, and Types of security, trust, security, vulnerability, safeguard and countermeasures.
 - Access Control Matrix Model; Protection Models; Policy formation
 - Authentication and Identity, Secure design principles, Network Security, Interception and denial of communications, Distributed authentication issues, Firewalls
 - Security Evaluation and Audit
 - Malicious Code: Viruses, Worms, Misuse and intrusion detection
 - Distributed attacks and defenses
 - Vulnerability Analysis, Cyber law, security Forensics
 - Physical threats, operational security, Legal and Societal Issues
 - Managing a secure environment
- (d) **Teaching and Learning Pattern:** The teaching and learning approaches will combine classroom lectures, discussions and group activities, quizzes and take home assignments. A group project shall form part of the coursework. The material presented in class will overlap that of the text but will contain additions and variations
- (e) **Indicative Content:** This course unit addresses the issues and problems involved in securing information and services provided via the Internet with particular reference to the World Wide Web. It exposes students from a variety of backgrounds, to the technical aspects of information confidentiality, integrity, availability; authentication models; protection models; security kernels; secure programming; audit; intrusion detection and response; operational security issues; physical security issues; personnel security; policy formation and enforcement; access controls; information flow; legal and social issues; identification and authentication in local and distributed systems; classification and trust modeling; risk assessment.
- (f) **Assessment Method:**
- Coursework = 40% consisting of:
 - Two written tests
 - Group project (with practical laboratory work involving creation of interactive www pages)
 - One take home individual assignment (journal literature)
 - Final written examinations (3 hours) = 60%

(g) Reference books

- (i) Mathew Bishop, Computer Security: Art and Sciences, Addison Wesley, 2003. ISBN 0-201-44099-7.
- (ii) Charles P. Pfleeger and Shari Lawrence. Security in Computing, Prentice Hall, 2003.

MIS 7100 Systems Analysis and Design (3 CU)

(a) **Course Description:** Use management information systems techniques to solve managerial and organizational problems of limited complexity. Includes solving formal analytic problems and implementing solutions using MIS development techniques.

(b) **Aims:** The course focuses on the following aspects of Information System Development:

- Study, Analysis and Design of a System
- Documenting and evaluating the System.
- Data Modeling.
- Developing Information Management System for an Organization.
- Implementing and Testing

(c) **Learning Outcomes:** On completion of this course unit, the students will be able to:

- Understand the requirements, carry out system study and analyze information.
- Document and evaluate a System.
- Develop an Information Management System for an Organization.
- Implement and Test the system

(d) **Teaching and Learning pattern:** The course will be delivered using lectures, tutorial/practical sessions as well as demonstrations. Individual and group-based tutorials and a Wide range of computer-based learning and other tools will be used to support the student's learning process, including use of real life case studies.

(e) **Indicative content:**

- Introduction: System Definition and Concepts: General Theory systems, Manual and automated systems, Real-life Business Sub-systems. System Environments and

- Boundaries. Real-time and distributed systems. Basic principles of successful systems. Approach to system development: Structured System Analysis and Design, Prototype, Joint Application Development.
- Systems Analyst: Role and Need of Systems Analyst. Qualifications and responsibilities. System Analysis as a Profession
 - System Development Cycle: Introduction to Systems Development Life Cycle (SDLC). Various phases of SDLC: Study, Design, Development, Implementation, Maintenance. System documentation consideration: Principles of Systems Documentation, Types of documentation and their importance, Enforcing documentation discipline in an organization
 - System Planning: Data and fact gathering techniques: Interviews, Group Communication - Questionnaires, Presentation and Site Visits. Assessing Project Feasibility: Technical, Operational, Economic, Cost Benefits Analysis, Schedule, Legal and contractual, Political. Modern Methods for determining system requirements: Joint Application, Development Program, Prototyping, Business Process Re-engineering. System Selection Plan and Proposal.
 - Modular and Structured Design: Module specifications, Top-down and bottom-up design. Module coupling and cohesion. Structure Charts.
 - System Design and Modeling: Process Modeling, Logical and physical design, Conceptual Data Modeling: Entity-Relationship Analysis, Entity-Relationship Modeling, ERDs and DFDs, Concepts of Normalization. Process Description: Structured English, Decision Tree, Decision Tables. Documentation: Data Dictionary, Recording Data Descriptions
 - Input and Output: Classification of forms, Input/Output forms design. User-interface design, Graphical interfaces. Standards and guidelines for GUI design. Designing Physical Files and Databases: Designing Fields, Designing Physical Records, Designing Physical Files, Designing Databases. Introduction to CASE Tools, Features, Advantages and Limitations of CASE Tools, Awareness about some commercial CASE Tools
 - System Implementation and Maintenance: Planning considerations. Conversion methods, procedures and controls. System acceptance criteria. System Evaluation and Performance. Testing and Validation. Preparing User Manual. Maintenance Activities and Issues
 - Computer System Audit and Security: Audit of Computer System Usage. Types of Threats to Computer System and Control Measures: Threat and Risk Analysis, Disaster Recovery and Contingency Planning, Viruses.
 - OO Analysis/Design: Introduction to UML. OO Development Life Cycle and Modeling. Static and dynamic modeling. Comparison of OO and Module-oriented Approach. Modeling using UML

(f) **Assessment method:** The assessment will be in form of tests and assignments (40%) and final written exam (60%)

(g) Reference Books:

(i) Modern Systems Analysis and Design, Second Edition, 2000, Joey George and Joseph Valacich Pearson Education. J. Hoffer

(ii) Systems Analysis and Design, First Edition, 2002, John Wiley & Sons, Inc. A. Dennis and B.H. Wixom

(iii) Systems Analysis and Design Methods, First Edition, 2000, Tata McGraw-Hill. J. Whitten, L. Bentley and K. Dittman

(iv) Management Information Systems, Seventh Edition, 2002, Pearson Education. K.C. Laudon and J.P. Laudon

MIS 7110 Database Systems (3 CU)

(a) **Course Description:** The concepts, principles, issues and techniques for managing corporate data resources of various types. Techniques for managing the design and development of large database systems including logical data models, concurrent processing, data retrieval, data distribution, and database administration.

(b) **Aims:** This course provides an understanding of the issues in managing database systems as an essential organizational resource. Students learn enterprise data architecture components, data storage configurations, and information retrieval methods. The course proceeds from the relational model to the multidimensional model, object-relational techniques, and web accessed data.

(c) **Learning outcomes:** On completion of this course unit, the students will be able to:

- Demonstrate an understanding of the issues in managing database systems as an essential organizational resource. Students learn enterprise data architecture components, data storage configurations, and information retrieval methods.
- Design, build and implement a database, exercise the database built under various conditions, query the database using SQL and use SQL to demonstrate implementation problems
- Evaluate file storage and transfer methods, Sort and merge files

- Demonstrate advancement from the relational model to the multidimensional model, object-relational techniques, and web accessed data.

(d) **Teaching and learning pattern:** Suggested pedagogical approaches to delivering the course:

- Case discussions to demonstrate management issues
- Lectures
- Team projects
- In-class student presentations

(e) **Indicative content:**

- The variety and complexity of current data management systems and evolving data management technology
- Enterprise data architecture components and data requirements
- The entity relationship model and Normalization
- Comparison of normalized and de-normalized models
- Relational integrity and concurrency control
- Limitations inherent in the relational model and possible solutions including object-oriented databases, object-relational databases, and multidimensional databases.
- Large text files, multi-media and embedded information needed for a complete information set
- Retrieving information using SQL and other methods
- Overview of database security, maintenance, recovery and tuning

(f) **Assessment method:** The assessment will be in form of tests and assignments & database system project (40%) and final written exam (60%)

(g) **Reference Books:**

- (i) Connolly, T., Begg, C. E., Holowczak, R. (2007). Business Database Systems. (2007). Publisher: Addison Wesley.
- (ii) Beynon-Davies, P. (2003). Database Systems. Publisher: Palgrave Macmillan; 3rd revised edition.

MIT 7115 Contemporary Issues in Information Technology (3 CU)

(a) **Course Description:** This course will provide an in-depth study of one or more, recent, emerging or potential important developments in IT that impact on forecasting, IT policy, global organizations and distributive computing, the role and responsibilities of the Chief Information Officer. IT and business strategies.

(b) **Aims:** This course aims at:

- Presenting and evaluating the most recent applications of IT e.g. the Internet, IT economy, online business, telecommuting etc.
- Reviewing an in-depth analysis of the changing force IT imposes upon people businesses and social organizations.

(c) **Learning outcomes:** At the conclusion of this Unit, students will be able to:

- Demonstrate in-depth knowledge on contemporary computer-based technologies being used by different types of people for different applications.
- Understand why certain types of people use overuse or refuse IT.
- Analyze the role IT plays in industry and envisage its changing force in creating new ways of conducting business.
- Analyze the role IT plays in the home and envisage its changing force in creating the home of the future.
- Demonstrate in-depth knowledge on the so-called e-boom and online activities such as telecommuting, online shopping, online banking, entertainment, communications, ecommerce and the like.
- Analyze and understand the implications of IT in creating new concepts for human communities (virtual communities) and human inter-relationships (impersonal relationships).

(d) **Teaching and Learning pattern:** Course delivery will be in form of lectures and tutorials.

(e) **Indicative content:** This course will take a look at the rise of IT in the late twentieth century and its role in the third millennium, philosophical issues and perspectives on IT analysis of the utilization of IT, IT hazards, IT and business today including online banking,

ecommerce, e-transactions etc.

- (f) **Assessment method:** final written examination (40%) Assessment will be in form of at least one (practical) assignment and one test 30%, A practical exam (4 hours open book) - (30%) and a final written examination (40%)

(g) Reference Books:

- (i) De Palma, P, (2004), Computers in Society, McGraw Hill.
(ii) Easton, A, (2004), Taking Sides: Science, Technology and Society, McGraw Hill
(iii) Arterton, F. C. (1997). Teledemocracy: Can Technology Protect Democracy. Sage Publications
(iv) Baudrillard, J. (1997). The Consumer Society: Myths and Structures. Sage Publications
(v) Blackler, F., & Osborne, D (1987). Information Technology and People. The MIT Press
(vi) Dunlop, C., & Kling, R. (1991). Computerization and Controversy. Academic Press.
(vii) Einon et al (1995). Information Technology and Society, SAGE Publications.
(viii) Feenberg, A. (1991). Critical Theory of Technology, Oxford University Press.
(ix) Finholt, T., & Huff, C. (1994). Social Issues in Computing: Putting Computing in Its Place. NY, McGraw-Hill.

MIT 7116 Research Methodology (3CU)

- (a) **Course Description:** In this course, guidance will be given to students on how to identify a research problem. Instructions will be provided which will enable students to perform effective literature reviews. Students will be presented with various research paradigms and models of methodology and assist with designing an appropriate method for their research. Students will be trained in the analysis and presentation of results, exposition of processes and methods used and conclusions drawn. Guidelines outlining the preparation and writing of a research dissertation and or a project will be provided at the conclusion of the course.
- (b) **Aims:** The aims of the course are:
- To provide students with a firm foundation/underpinnings of research from which they can undertake a research problem
 - To provide students with a number of separate, but related practical skills associated with the research process

(c) **Learning outcomes:** At the end of this course unit, the students will be able to identify the aims of the research, selection of appropriate methodological approach, selection of implementation methods, data collection and analysis techniques and its interpretation, and how all this fits within the literature. In other words, the students will produce a research proposal as a blue print for the whole research dissertation and or project.

(d) **Teaching and Learning Pattern:** Lectures will be given through out the semester. Group work and discussions to perform literature reviews will be done to enable understanding and application of concepts. This will involve identification and reading material which includes journal papers to be distributed to students a week in advance. The lecturer addresses questions to the students to encourage them to think about and understand the material. The students will identify researchable problems from which they will apply the concepts taught in class with an aim of producing research/project proposals by the end of the semester. The students will be required to build on their proposals on a weekly basis in line with the new concepts that will be taught. The students will make presentations of their draft proposal for critique and feedback from both the students and the lecturer.

(e) **Indicative Content:** The course will cover the following topics:

- Definition of Research Methodology
- Research Paradigms in Computing and Information Systems
- Research Planning and Management
- Types of Research Methods
- Scientific writing including abstracts; identifying research problems, research objectives and questions; Interpretation of technical literature (literature reviews); Selection of overall methodological approach; Selection of suitable data collection and analysis techniques; Interpretation and conclusion of the research; and Presentation of research findings
- Research Ethics/Plagiarism

(f) **Assessment Method:** Assessment will be categorized as follows:

- Progressive assessment 40%
 - Group work (literature reviews) 20%
 - Presentation (skills) 10%
 - Theory and application (concepts) 10%
- Final written Exam 60%
 - Individual work (scientific writing and research paper) 40%
 - Theory and application (concepts) 20%

(g) Reference books

- (iii) Practical Research: Planning and Design (March 2004): Paul D. Leedy, Jeanne E. Ormrod, Jeanne Ellis Ormrod, Paperback, Prentice Hall
- (iv) Graduate research: A guide for Students in the sciences (May 1998): Robert V. Smith, Paperback, University of Washington
- (v) Research Methods: A process of Inquiry ((May 2006)): Anthony M. Graziano, Michael L. Raulin, Hardcover, Prentice Hall
- (vi) Introduction to qualitative research methods: A guidebook and resource (1998): Taylor, Steven J.; Bogdan, Robert, Hoboken, (3rd Ed.) NJ, US: John Wiley & Sons Inc.

5.2. Semester II

MIS 7209 Project and Organization Change Management (3 CU)

- (a) **Course Description:** This course deals with managing projects within an organizational context, including the processes related to initiating, planning, executing, controlling, reporting, and closing a project. Project integration, scope, time, cost, quality control, and risk management, Software size and cost estimation are also introduced in this course. Additionally, assigning work to programmer and other teams, monitoring progress, Version control is introduced to the students. With respect to the Organization change, students are taught how to manage the organizational change process, identify project champions, working with user teams, training, and documentation. More so, the change management role of the IS specialist and the use of sourcing and external procurement; contracts and managing partner relationships is also taught to the students.
- (b) **Aims:** The course aims at providing students with the ability to develop detailed project plans, schedules, and budgets; estimate project resources; allocate/coordinate resources; and interface with management. They are expected to learn tools and techniques of project planning and management, including the use of project management software. The course develops skills in the human and organizational implications of change including understanding the organizational change process; identifying stakeholders; assessing potential impacts of projects; and overcoming resistance, politics, and other human issues.
- (c) **Learning Outcomes:** Upon completion of the course the students should be able to:
 - Develop detailed project plans, schedules, and budgets

- Estimate project resources; allocate/coordinate resources; and interface with management.
- Use tools and techniques of project planning and management, including the use of project management software.
- Have skills in the human and organizational implications of change including understanding the organizational change process; identifying stakeholders;
- Assess potential impacts of projects; and overcome resistance, politics, and other human issues.

(d) Teaching and learning pattern: Teaching will be in terms of lectures, case studies and group work

(e) Indicative content:

a) Managing software / technology projects:

- Project lifecycle, Project stakeholders, Project management skills (leading, communicating, negotiating, influencing, and presenting)
- Project planning (definition, scope, schedule, costs, quality, resources, and risks)
- Estimating software size and cost.
- Software work module design, assignment, and control.
- Role of repository, project library, and version control.
- Contingency planning
- Project reporting and controls (definition, scope, schedule, costs, quality, resources, and risks),
- Testing and testing plans; alpha and beta.

ii) Managing organization change:

- The role of IS specialists as change agents, Envision change and the change process, Diagnose and conceptualize change
- Deal with the challenges of implementation and understand and cope with resistance
- Deal with issues of motivation, interpersonal relations, group/team dynamics, and leadership in the change process; implications of cross-organization and international teams.
- Manage organizational politics
- The limitations of projects as organizational change initiatives

- Organizational influences on project success (culture, organizational structure, rewards, and measures)
- Software project management resources and professional development such as SMI and PMI.
- Additional activities required to ensure the success of IT projects (training, job redesign, communication, etc.)
- Manage sourcing partners as well as define contract and relationships
- Hands-on experience using project management software (e.g., Microsoft Project).

(f) **Assessment method:** The assessment will be in form of tests and assignments (40%) and final written exam (60%)

(g) **Reference Books:**

- (i) A Guide to the Project Management Book of Knowledge by the Project Management Institute, IEEE Std 90-2003.
- (ii) Project management for information systems, Edited by James Cadle and Donald Yeates, Prentice Hall, 2001
- (iii) Breakthrough technology project management, Bennet P. Lientz, Academic Press, 2001.
- (iv) The project manager's desk reference: a comprehensive guide to project planning, scheduling, evaluation, and systems, James P. Lewis, McGraw-Hill, 2000.
- (v) Project management for business and technology: principles and practice, John M. Nicholas, Prentice Hall, 2001.

MIT 7214 Audit and Security Assurance Principles (3 CU)

(a) **Course Description:** This course will offer the students a holistic overview to audit and security assurance issues pertinent in an enterprise. The course will specifically tackle Security mechanisms, Operational issues, Policy, Attacks, Information Systems Audit, Data Center Audit, topics in Computer Audit etc. Security Domains, Forensics, Information States, Security Services, Threat analysis model, Vulnerabilities and other security issues will also be looked at.

(b) **Aims:** The course aims at:

- Introducing students to the concepts of Information Assurance and how to secure such information using appropriate systems and technologies.
- Presenting introductory aspects on computer audit including auditing information systems, auditing computerized systems, auditing applications etc.

(c) **Learning Outcomes:** On completion of this course unit, the students will:

- Have a firm grasp of the concepts related to Information Assurance and be able to articulate the salient principles about Information Assurance that derive from the concepts.
- Be able to advise enterprises on the appropriate interventions to take as regards audit and assurance in the enterprise.

(d) **Teaching and learning pattern:** Course delivery will be in form of lectures and tutorials (including relevant scenarios in the enterprise)

(e) **Indicative content:**

- Security mechanisms
- Operational issues
- Policy
- Attacks
- Security Domains
- Forensics
- Information States
- Security Services
- Cryptographic protocols
- Audit of Computer Systems
- Applications, Business Security and Control

(f) **Assessment method:** The course will be assessed by course work and tests (40%) and final examination (60%)

(g) Reference Books:

- (i) Computer Security Lab Manual (Information Assurance & Security) by Vincent Nestler, Wm. Arthur Conklin, Gregory White and Matthew Hirsch Publisher : Career Education 2005.
- (ii) Security in Computing, 4th Edition by Charles P. Pfleeger and Shari Lawrence Pfleeger. Publisher: Prentice Hall 2006.

MIT 7215 IT Strategic Planning and Management (3 CU)

(a) **Course Description:** This course addresses the ways in which the managers use modern business information systems and networks to enhance the management process and promote business outcomes. Building on core concepts of the role and function of information systems in the organization, the course focuses on the key areas of management decision making related to investment in and strategic management of information technology resources. The impact of digital networks and communications technology on modern business activities and strategies is a core theme of the course.

(b) **Aims:** A student that undertakes this course should be able to understand:

- Concepts relating to the role and function of networked business information systems, and the typical applications found in the modern organization;
- Typical activities and decisions involved in the acquisition and/ or development and management of networked business information systems and their impact on organizations;
- Be able to understand information systems and eBusiness strategy ;
- Be able to understand the development and use of networked business information systems in the context of promoting overall business objectives, and the place of information technology management within the organization;
- Be able to understand how networked business information system activities are led and managed in the context of the intersecting interests of business executives, IT executives, partner organizations, and IT users.

(c) **Teaching and learning pattern:** This will include lectures and tutorials

(d) **Learning outcomes:** Upon successful completion of the course the student will reliably demonstrate the ability to:

- explain the role of, and comment on a range of modern business applications;
- survey the range of activities involved in, and decisions related to, the acquisition and/or development of a business information system;
- comment critically on information systems and eBusiness strategy;
- appreciate the effective use of communications and information technology;
- present a rationale for decision-making around the strategic use of networked business information systems using appropriate supporting data

(e) Indicative content:

- Understanding information, its management, and the history of IT
- The role and importance of BIS and IT management in the enterprise.
- Where does BIS management fit in the organization and what kinds of leaders are needed?
- IT processes in the organization
- Planning-related IT processes
- Managing the essential technologies in the digital economy
- Methods of acquiring information systems
- Systems development life cycle
- Initiating systems development
- Systems analysis and design
- Information technology project management
- Outsourcing and vendor management
- Managing information security
- Systems for supporting decision-making, collaboration and knowledge work
- IT planning, strategy and strategic alignment
- Assessing the value of IT
- The future of IT in the enterprise: commodity or business driver?
- E-Business: technologies and business models
- E-business strategy
- Defining strategic direction in eBusiness
- Managing emerging technologies

(f) Assessment method: The assessment will be done by tests and take home assignments (40%), and written examination (60%)

(g) Reference Books:

- (i) McNurlin, Barbara C., Ralph Sprague and Tung Bui. 2008. Information Systems Management in Practice. 8th Edition. Prentice Hall. ISBN: 0132437155
- (ii) Afuah, Alan and Tucci Christopher L. (2003). Internet Business Models and Strategies: Text and Cases. 2nd ed. McGraw Hill, New York. (Chapter 11, pp. 203 – 223)
- (iii) Bocij, Paul et al. (2005) Business Information Systems: Technology, Development and Management for the e-business. 3rd Edition. Financial Times / Prentice Hall.

MIT 7216 E-Service Delivery (3 CU)

- (a) **Course Description:** The course begins by looking the definitions of e-governance and e-government. The course then introduces policy and management issues specific to e-governance. The course seeks to introduce students to topics salient to effective governmental adoption and implementation of initiatives mediated by the Internet, including e-procurement, e-licensing, online citizen access to governmental databases, and e-democracy initiatives, both in terms of prerequisites to successful implementation and in terms of organizational and social impacts of these initiatives. Core questions addressed in the course include what government functions are best implemented through e-government methods, how e-government initiatives may be evaluated to assess effectiveness, what exemplary practices might improve e-government effectiveness, what the sociopolitical implications of e-governance are, and how the training of public administrators must change given new roles emerging due to the rise of e-governance.
- (b) **Aims:** The course aims to provide basic knowledge on the delivery of Electronic Services and its importance to society. In particular, it examines the basics of e-governance; e-governance laws and policies; and different kinds of e-services delivered by governments. In addition, models of best practices in e-service delivery will be taught. Specific objectives of the course are to:
 - provide knowledge and understanding of existing and emerging Electronic Services;
 - provide knowledge and understanding of possible innovations in public administration through Electronic Services delivery;
 - develop skills of the effective use of Electronic Services as citizens;
 - to help graduate students to choose topics for their future Masters projects and dissertations.

(c) **Learning Outcomes:** Upon successful completion of this course, the student should be able to:

- Have knowledge and understanding of
 - Electronic Services and its importance to society;
 - basics of E-governance and its laws and policies;
 - models of best practices in e-service delivery
 - possible innovations in public administration through E-services delivery
- Develop skills of the effective use of Electronic Services as citizens

(d) **Teaching and Learning pattern:** Since this course is supposed to have only lecture hours, it will form mostly the theoretical knowledge. To provide students with practical skills, they will be given individual and group assignments to be done as a form of extracurricular activity.

(e) **Indicative content:** E-governance; E-government. Policy and management issues specific to E-governance; Effective governmental adoption; E-government initiatives: E-procurement; E-licensing; online citizen access to governmental databases; E-democracy initiatives. Successful implementation of E-government initiatives; Organizational, social and political impacts of E-government initiatives. E-government functions. E-government methods; E-government effectiveness evaluation and improvement; and Training of public administrators on E-governance.

(f) **Assessment method:** Assessment will be in terms of tests and coursework (40%) and a final examination (60%)

(g) **Reference books:**

- (i) Lamersdorf, W., Tschammer, V. & Amarger, S. (2004). Building the E-Service Society: E-Commerce, E-Business and E-Government. Kluwer Academic Publishers
- (ii) Malkia, M., Savolainen, R., Anttiroiko, A.-V. (2003). E-Transformation in Governance: New Directions in Government and Politics. Idea Group Publishing.
- (iii) Pavlichev, A., Garson, G.D. (2003). Digital Government: Principles and Best Practices. Idea Group Publishing.
- (iv) Gronlund, A. (2002). Electronic Government: Design, Applications and Management. Idea Group Publishing.

- (v) Curtain, G.G., Sommer M.H., Vis-Sommer, V. (2004). The World of E-Government. Haworth Press, 2004
- (vi) Huang, W., Siau, K., Wei, K.K. (2005). Electronic Government Strategies and Implementation. Idea Group Publishing
- (vii) Dunleavy, P., Margetts, et al. (2006). Digital Era Governance: IT Corporations, the State, and e-Government. Oxford University Press.
- (viii) Curtain, G. G. et al. (2004). The World of E-Government. Haworth Press.

MIT 7217 Web Design and Usability (3 CU)

- (a) **Course Description:** This course provides students with non-IT educational background with necessary knowledge of core principles and technologies of Web design. Topics covered in this course include fundamental principles of Web design such as information architecture, page layout, color principles, style consistency, and use of multimedia. Overview of Web technologies is dealt with markup languages (HTML, XHTML, and XML), Style Sheet Languages (CSS, XSL), client-side scripting (JavaScript, VB Script), service-side scripting (PHP, ASP) and multimedia technologies (Flash). Other topics focus on practical issues of building effective Web sites in terms of enhancing their usability. Students will be given individual and group assignments to form practical skills.
- (b) **Aims:** This course aims to provide students with non-IT educational background with necessary knowledge of core principles and technologies of Web design. Those students who already studied Web technologies being at the bachelor's level this course helps to systemize their knowledge before taking further courses like XML and Web Services etc.
- (c) **Learning outcomes:** On completion of this course unit, the students will be able to have:
- Knowledge and understanding of:
 - fundamental principles of Web design
 - main Web technologies
 - Practical skills of;
 - using principles of Web design
 - Web technologies
 - building effective (usable) Web sites

(d) **Teaching and learning pattern:** Since this course is supposed to have both lecture and practical hours, it will form the theoretical knowledge as far as practical skills is concerned. To provide students with practical skills, they will be given individual and group assignments to be done within practical and extracurricular hours.

(e) **Indicative content:** Fundamental principles of Web design: Information architecture; Page layout. Color principles; Style consistency; and Use of multimedia; Overview of Web technologies: Markup languages (HTML, XHTML, XML); Style Sheet Languages (CSS, XSL); Client-side scripting (JavaScript, VB Script); service-side scripting (PHP, ASP); Multimedia technologies (Flash); and Building effective Web sites in terms of enhancing their usability.

(f) **Assessment method:** Course work which will consist of tests or take home assignment as well as practical projections will contribute 40% (Test I: 15%, Test II: 15%, Assignment: 10%) of final mark. While an end of semester exam will contribute the remaining 60 %

(g) **Reference Books:**

(i) Fowler, S., Stanvik V. (2003). Web Application Design Handbook: Best Practices for Web-Based Software. Elsevier Inc, Morgan Kaufmann Publishers, San Francisco. ISBN: 1-55860-752-8

(ii) Brink, T., Gergle, D. & Wood, S. (2003) Usability for the Web: Designing Web Sites that Work. Morgan Kaufmann Publishers, San Francisco

(iii) Spool, J. M., Scanlon, T. et al. (2003) Web Site Usability: A Designer's Guide. Morgan Kaufmann Publishers, San Francisco

(iv) Johnson, J. (2003). Web Bloopers: 60 Common Web Design Mistakes, and How to Avoid Them. Morgan Kaufmann Publishers, San Francisco

(v) Yuen, P.K., Lan, V. (2003). Practical Web Technologies. Pearson Education Ltd. ISBN 0201 750767

(vi) Welling, L., Thomsen, L. (2005). PHP and MySQL Web Development (Third Edition). Sams Publishing ISBN 0-672-32672

MIT 7218 Legal and Ethical Aspects of Computing (3CU)

- (a) **Course Description:** The course focuses on issues that involve computer impact on society and related concerns. The students will be taught issues on: Transitional data flow; copyright protection; Information as a source of economic power; rights to access computer systems; computer crime; data privacy; establishing national priorities in the technical and social aspects of computing; current and anticipated uses of computer prediction. The course will also examine and evaluate the meaning of ethics and professional conduct including the protection of personal ethical concerns. The students will also be exposed to the status of the regulation and emerging markets.
- (b) **Aims:** This course aims at providing students with:
- A good grounding in social, legal, ethical and management issues affecting their probable role as researchers and or working computer scientists, practitioners or engineers in Computing and Information Technology-related disciplines.
 - The basic background to develop their professional role in the workplace, beyond simply performing technical tasks assigned to them.
- (c) **Learning outcomes:** Upon successful completion of this course, the students will:
- Apply the ethical concepts relevant to resolving moral issues in business, industry, and other relevant areas of concern;
 - Articulate and defend with good reasons his/her own ethical point of view pertaining to specific problem areas in business, industry, and related areas;
 - Analyze business plans, working procedures and policies in terms of current legislative and case law;
 - Evaluate proposed and actual changes in the law for their effect on their working and personal environments in terms of rights, liabilities and responsibilities; Present compelling arguments about the social impact of new technological developments; and
 - In addition, students should be able to maintain and develop their awareness of the social, legal and ethical framework in which they find themselves, through knowledge of the underlying mechanisms of change in these areas.
- (d) **Teaching and Learning Pattern:** The course will primarily be taught by external seminar speakers (i.e. professionals in the field of IT and Law related disciplines) and directed reading (from internet resources and text books as seen in the reading list). Also interactive lectures i.e. presenting a topic to the class and giving a starting point from

which the students can give their own ideas will be used in learning this course. Strong encouragement will be given for students to continue these discussions outside lectures both in person and using online discussion tools such as MUELE (Makerere University Elearning). Current IT-related legislation and case law will be taught by direct lectures, supported by directed reading. Assignments with strong formative aspects (requiring self-directed research on a topic) will support each of the sections of the course.

(e) **Indicative Content:** The course will cover the following topics:

- Nature of ethics, ethical development, responsibilities and basic ethical directions
- Ethical principles, values, and their foundations
- Specific computing and information technology related business, industry, and engineering ethical issues
- Social impact of technological change: Internet communications; medical technologies; bio-engineering; education; entertainment; industry, commerce and working practices; globalization; public misunderstanding of science; environmental impact of high technology
- National and international legal frameworks; specific legislation and case law involving IT issues
- Domain Names; IP law; Data Protection; Computer misuse; Software Licensing, Transitional data flow; copyright protection; Information as a source of economic power; rights to access computer systems; computer crime; data privacy; establishing national priorities in the technical and social aspects of computing
- Research ethics / plagiarism

(f) **Assessment Method:** Assessment will be made up of coursework (40%) and a final written exam (60%). Coursework will entail four parts:

- A portfolio or similar on social issues (10%);
- An essay on a legal question (10%);
- Individual questions from the external speakers requiring short answers (10%);
- In-depth concise online discussions on legal and social issues (10%)

(g) **Reference books**

(i) Computer Ethics: Integrating Across the Curriculum by Marion Ben-Jacob, Mercy College, ISBN-13: 9780763778095, ISBN-10: 0763778095, Cd-rom, 2010

(ii) Pandora's Box: Social and Professional Issues of the Information Age by Andrew A. Adams and Rachel McCrindle (Paperback - 14 Dec 2007)

(iii) Engineering Ethics by Charles B. Fleddermann, 1st edition Prentice Hall, 1999. ISBN 13: 9780137842247

- (iv) Engineering, Business and Professional Ethics by Moodley, Krisen, Elsevier Science & Technology 2007, ISBN-13: 9780750667418

MCS 7226: Seminar Series (2CU)

- (a) **Course Description:** The course helps students to strengthen their ability to do guided research, make a report on technical issues and present these issues in a scientific set up. While lecturers will give the students guidelines on the topics to research on, they will not formally teach them in class. However, what is expected out of the students will be explicitly given to them and examined.
- (b) **Aims:** The aims of the course are:
- To develop the students' ability to search for and internalize scientific academic material
 - To develop the student's skills in technical writing
 - To develop the student's presentation skills.
- (c) **Learning outcomes:** At the end of this course unit, the students should be able to:
- Read and internalize scientific academic material in his/her area of study;
 - Adequately and competently report academic findings in technical documents (reports, articles, etc);
 - Prepare good presentations for dissemination of scientific findings; and competently present scientific findings.
- (d) **Teaching and Learning Pattern:** Students will be given broad areas of study together with research questions to address by the beginning of the second semester. Each student will be given a senior staff from whom they can get advice and guidance whenever necessary. The student will then be required to address one research problem and make a write up on it. The student will then be required to present his work to the staff and his/her peers. As part of the course, the student will also be obliged to attend all (weekly) research talks in the faculty (for the entire second semester).
- (e) **Indicative Content:** The content is both in terms of skill and technical content.
- Technical content: This depends on the problem addressed. The student is expected to show understanding and comprehension of the subject matter.
 - Skill content: a student is expected to show ability to comprehend scientific literature, correctly make a technical report and competently prepare and make an academic presentation.
- (f) **Assessment Method:** Assessment will be made up of 4 parts:
- Attendance of weekly research talks (Semester 2) 10%
 - Report writes up 50%
 - Presentation 20%
 - Knowledge of subject matter 20%

- (g) **Reference books:** The textbooks and articles will depend on the problem being addressed.

6. Resources and Infrastructure

The Faculty of Computing and Information Technology and specifically the Department of Information Technology have sufficient resources and infrastructure to suitably run the revised program as further described below.

6.1. Source of Funds

Fees payable by the students will enable the University to sustain the programme.

6.2. Staff

The Department of Information Technology (see list of staff members in Appendix A) in conjunction with other departments in the Faculty of Computing and Information Technology have an adequate number of staff who can competently teach the courses.

6.3. Lecture Space

The Faculty of Computing and Information Technology is housed on 2,500 and 12,000 square meter buildings known as Block A and B, respectively. Block A mainly accommodates offices and a few laboratories, while Block B has lecture rooms together with the rest of the general and specialized laboratories. The two buildings sufficiently cater for all the lecture and lab space requirements for all the teaching in the faculty. Specifically CIT has 6 lecture theatres each of 400 square metres (600seat capacity) ; 6 small lecture theatres of total area 1200 square metres and 1800 square metres of circulation space where students are able to access other services such as wireless internet services.

6.4. Computer Laboratories and Software

The FCIT buildings i.e. Block A and B respectively, have general laboratories (for student practice), teaching laboratories and specialized laboratories, that are shared among the four departments. At present, these laboratories have in total approximately 2000 computers. In summary, CIT has **got** 6 computer laboratories each of 800 square metres (1000 seat capacity) and 6 small laboratories of total area 1200 square metres. More lab details can be found on the Faculty website: <http://cit.ac.ug/cit/facilities/labs.php>.

At the same time, the Faculty has an approximation of 5000 students; which makes the student to computer ratio 1:2.5. This is adequate for the practical components of the curriculum.

In addition to the physical computers, different software is installed for usage by students depending on their focus. Most of the software is available as free distributions for academic purposes. The faculty and department therefore have (and can access) enough software that can run the practical aspects of the program.

6.5. Library Services

Makerere University Library supports a book bank system which is operated at the Faculty level (Block B Building). The book bank is stocked with up to date literature. The books in the book bank have been acquired through supplies from the Makerere University Library and purchases by the Faculty for books that are difficult to purchase by the main library. In addition to this facility the Makerere University main library provides access to books, print journals, e-journals, a well stocked reference section and connections to many remote databases. The Online Journals which are also accessed through the main University library provide a range of products from abstracts to full text papers. The University Library has also acquired a wide range of online books which are to access and this is in line with promoting e-learning.

7. Quality Assurance

Several activities will be carried out as quality assurance measures so as to:

- (a) Measure the general extent to which the required skills have been achieved
- (b) Ascertain the Implementation of the methodological changes proposed
- (c) Create a feed back bench marks for possible future revisions in the curriculum

The following activities will be carried out in the process of monitoring and assuring quality in the program.

7.1. Feedback from students enrolled

In the current set up, each class has 1 student representative. These representatives are in constant contact with the Head of Department in case there are any quality related matters in a particular class. This set up is to be maintained.

In addition, at the end of each semester, samples of students from respective classes/years are given questionnaires to respond to several quality related matters like staff punctuality, delivery mode, course content and the general perceived usefulness of the course unit.

We note that the Faculty of Computing and Information Technology is in the process of creating a

computerized system that will capture and analyze the data collected from the students. With the computerized system:

- (i) Every student will be required to assess every lecturer teaching him/her, the sample space will therefore be increased
- (ii) No time will be required in the analysis of the results. Staff and faculty management will be able to get the feedback instantly
- (iii) Data will be easily archived and therefore the trend of staff performance in the respective areas will be easy to visualize

7.2. Class meetings

The faculty management makes at least 2 meetings with every class every semester. In this meeting, general quality issues are addressed. Students are also given a chance to raise any questions that are answered and/or addressed by the department management. This set up will also continue.

7.3. Use of ICT in availing lecture materials

Currently, Makerere University has the blackboard e-learning tool on its Intranet. Students in the Department of Information Technology have adequate access to computers. This creates conducive environments for e-learning blended teaching. All courses in the new curriculum will be taught in a blended way. All course materials will be put on blackboard. Staff will, as much as possible, make use of e-learning facilities like discussion forum and drop boxes for assignments. This will increase student activity/participation and reduce staff effort (e.g. staff will not need to dictate notes). This will result to increase in the material covered and taken in by the students.

7.4. Peer review

All members of staff will enroll (as students) to all classes taught in the department. They will therefore be able to view contents of courses taught by their peers. The staff will be free to advise fellow staff on the content, depth and presentation of materials. Consequently, for every course, students will access the best possible material in the view of all staff in the department not the course instructor.

7.5. External examiners' reports

Like it is everywhere in Makerere University, students' research dissertations and exams are reviewed by senior external examiners. This is to bring a 'foreign view' of the quality of the research and examination. External examiners write reports on their view of the research,

curriculum, and examinations. Recommendations for the students about their research should be implemented immediately prior to viva-voces while for exams can be implemented immediately or in a longer term. The department will make the maximum possible use of external examiners' reports as a means of assuring quality in the program and research.

7.6. Tracer studies

The Faculty of Computing and Information Technology is devising ways of keeping in contact with its alumni together with their employers. This is with a view of making a tracer study of its graduates. The Department of Information Technology will use outputs of the tracer studies to gauge the quality of the program and whenever necessary improve it.

Appendix A. IT Departmental Academic Staff List

S/N	Name	Rank	Qualification/ Comment	Specialization	Current Teaching Load		Proposed Teaching Load		Total Load (CU)	
					Sem. 1	Sem. 2	Sem. 1	Sem. 2	Sem. 1	Sem. 2
1	Irina Ya. Zlotnikova	Visiting Professor	PhD	E Learning, Theory and Methodology of Computer Science Education, Software Engineering for Educational Purposes, Development of Educational Web Resources			MIT 8100: Secure Computer Systems (3CU) & MIT 7100: Information Security (3CU)	MIT 7214: Audit and Security Assurance Principles (3CU)	6	3
2	Joseph K. Ssewanyana	Senior Lecturer	PhD	Business process modeling, and ICT for development			MIS 7100: Systems Analysis and Design (3CU) & MIT 8101: Network Security	MIS 7209: Project and Organization Change Management (3CU) & MIT 7215: IT	6	6

							(3CU)	Strategic Planning and Management (3CU)		
3	Jude T Lubega	Lecturer	PhD Ag. Deputy Dean (GSR)	Tracking and Assessment in e-learning, Content Authoring, Multimedia, Multi-Agent Systems, Data Warehousing, Knowledge Representation, and ICT for Development, Web-based Systems and Mobile Learning			MIT 7115: Contemporary Issues in IT (3CU)		3	
4	Josephine Nabukenya	Lecturer	PhD Ag. Head of Department	Collaboration Engineering, Analysis and design of information and systems flows; and Facilitating organizational change by adoption and diffusion of ICT			MIT 7116: Research Methodology (3CU) & MIT 8102: Database Security (3CU)	MIT 7218: Legal & Ethical Aspects of Computing (3CU)	6	3

Appendix B. Full Time Staff from Other Departments

S/N	Name	Rank	Qualification/ Comment	Specialization	Current Teaching Load		Proposed Teaching Load		Total Load (CU)	
					Sem. 1	Sem. 2	Sem. 1	Sem. 2	Sem. 1	Sem. 2
1	Patrick Ogao	Associate Professor	PhD	GIS, Computer graphics, visualization			MIT 8103: Applied Cryptography (3CU)		3	
2	Martin Bagaya	Lecturer	PhD	Web Services, Database Design and Administration, Offshore outsourcing, Security			MIS 7110: Database Systems (3CU)		3	
3	Agnes R Semwanga	Lecturer	PhD	Education (specifically math), Management Information Systems, Computer Modeling and simulation, Decision support systems			MIT 8104: Online Information Services (3CU)		3	
4	Jose Quinum	Senior Lecturer	PhD	Computer Science, Software Engineering and Security				MCS 7226: Seminar Series (2CU)		2

Appendix C: Visiting Staff

	Name	Highest Degree	Rank	Specialization	University	Proposed Teaching Load	Proposed Teaching Load	Visiting Period
						Sem 1	Sem 2	
1	Greg Gibbon	PhD	Senior Lecturer	Mathematical Logic	University of New Castle	MIT 8109: Web-based Information Systems & Web Mining Technology (3CU)	MIT 7216: E-Service Delivery (3CU)	15 th August 2009- 20 th May 2010
2	Janet Aisbett	PhD	Professor	Information Systems	University of New Castle	MCS 8100: Artificial Intelligence & Expert Systems	MIT 7217: Web Design and Usability (3CU)	10 th August 2009- 8 th May 2010
3	HN Muyingi	PhD	Professor	Information Systems	University of Fort Harare	MIT 8108: Supply Chain Management (3CU)		15 th August – 20 th Dec 2009
4	Timothy M. Waema	PhD	Assoc. Professor	Information Systems	University of Nairobi	MIT 8107: Security, Risk Management and Control in e-		20 th August – 30 th Nov 2009

						commerce (3CU)		
5	Ravi Nath	PhD	Professor	Information Technology	Creighton University	MIT 8106: Web Database Applications(3CU)		12 th August – 28 th Nov 2009
6	Jean Hall	PhD	Senior Lecturer	Information Technology	University of Australia	MIT 7100: Information Security (3CU)		16 th August – 20 th December 2009
7	Kathy Lynch	PhD	Senior Lecturer	Information Technology	University of Monash	MIT 8105: IT Strategy and Management (3CU)		20 th August 2009 – 8 th January 2010

Appendix D: Part-time Staff from Other Institutions outside Uganda under the project 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda'

	Name	Highest Degree	Rank	Specialization	Comments
1	Koos Duppen	PhD	Professor	CS	University of Groningen
2	Wim H Hesselink	PhD	Professor	CS	University of Groningen
3	Jan Bosch	PhD	Professor	CS	University of Groningen
4	Gert Vetger	PhD	Professor	CS	University of Groningen
5	Doitse Swierstra	PhD	Professor	CS	Utrecht University
6	Hendrik Alex Proper	PhD	Professor	CS	Radboud University Nijmegen

7	Theodorus Petrus van der weide	PhD	Professor	IS	Radboud University Nijmegen
8	Peter Lucas	PhD	Ass. Professor	CS	Radboud University Nijmegen
9	Renardel de Lavaelte, Gerald Rudol	PhD	Professor	Math / CS	University of Groningen
10	Karl Leo Lambert Marie Dittrich	PhD	Assistant Professor	Management	University of Groningen
11	Richard Wait	PhD	Professor	IT	Uppsala (Sweden)
12	Hendrik Jan Van Linde	PhD	ICT Consultant	Mathematics/ CS	University of Groningen
13	John Nerbonne	PhD	Professor	IS	University of Groningen
14	Jan Folkert	PhD	Ass. Professor	Educational ICT	University of Groningen
15	Jos Tolboom	PhD	Programme Manager	Math/ CS	University of Groningen
16	Robert Janz	PhD	Director	IT	University of Groningen
17	Marc Petit	PhD	Senior Consultant	Math/ CS	University of Groningen
18	Rein Smedinge	PhD	Faculty IT Staff	CS	University of Groningen
19	Marinus (Rien) A.C Dam	PhD	Management	Earth Sciences	University of Groningen
20	Harm Bakker	Msc.	Senior Lecturer	CS	University of Groningen
21	Ria Klasine Jacobi	MSc	Senior Educational Consultant	ICT & Education	University of Groningen