

MAKERERE



UNIVERSITY

**COLLEGE OF COMPUTING AND INFORMATION
SCIENCES**

**SCHOOL OF COMPUTING AND INFORMATICS
TECHNOLOGY**

P.O. BOX 7062, KAMPALA, UGANDA

**BACHELOR OF INFORMATION SYSTEMS AND
TECHNOLOGY (BIST) DEGREE PROGRAM**

STARTING

2017/2018

(DAY AND EVENING PROGRAM)

Table of Contents

1. Background to the School of Computing and Informatics Technology.....	1
2. The Bachelor of Information Systems and Technology Program.....	2
2.1 Target Group.....	2
2.2 Nature of the Program.....	2
2.3 Duration	2
2.4 Tuition Fees	2
3. Program Description.....	2
4. Program Rationale.....	4
5. Program Objectives	6
6. Program Learning Outcomes.....	6
7. Regulations.....	7
7.1. Admission Requirements	7
7.2. Progression.....	8
7.3. Weighting System	8
7.4. Semester Load and Minimum Graduation Load.....	8
7.5. Course Assessments	8
7.6. Grading of Courses.....	9
7.7. Minimum Pass Mark.....	9
7.8. Calculation of Cumulative Grade Point Average (CGPA).....	10
7.9. Knowledge Areas in the BIST Program.....	10
8. Resources and Infrastructure	11
8.1. Sources of Funds	11
8.2. Staff.....	11

8.3. Lecture Space	11
8.4. Computer Laboratories and Software	12
8.5. Library Services	12
8.6. Number of Students	12
9. Program Structure	13
9.1. Course Outline	13
Year 1 Semester I (5 Courses)	14
Year 1 Semester II (5 Courses)	14
Year 1: Recess Term.....	14
Year 2 Semester I (5 Courses)	15
Year 2 Semester II (5 Courses)	15
Year 2: Recess Term.....	15
Year 3 Semester I (5 Courses) – Information Technology Security Option	16
Year 3 Semester II (4 Courses) – Information Technology Security Option	16
Year 3 Semester I (5 Courses) – Systems Development Option.....	16
Year 3 Semester II (4 Courses) – Systems Development Option.....	17
Year 3 Semester I (5 Courses) – Information Systems Management Option.....	17
Year 3 Semester II (4 Courses) – Information Systems Management Option.....	17
10. The Detailed Curriculum	18
Semester 1.....	18
Foundations of Information Systems and Technology	18
Communication Skills	21
Emerging Trends in Information Systems and Technology	23
Structured Programming.....	25

Basic Mathematics.....	26
Computer Literacy	28
Semester 2.....	31
Applied Business Statistics	31
Introduction to Computer Networks	32
Data and Information Management I	34
Systems Analysis and Design	37
Object Oriented Programming	39
Semester 3.....	41
Data and Information Management II	41
Web Systems and Technologies I	43
Entrepreneurship Principles.....	45
Information Systems Security and Risk Management	47
Electronic Media Systems and Multimedia	49
Semester 4.....	51
System Administration	51
E-Services	53
Research Methodology.....	55
Web Systems and Technologies II	60
Semester 5 – Information Technology Security Option.....	62
Project I	62
Network Security.....	64
Enterprise Network Management	66
Intrusion Detection and Incident Management	68

Digital Forensics Investigation	70
Semester 6 – Information Technology Security Option	73
Project II	73
Ethical Hacking	74
IT Law and Ethics	76
Information Systems Audit	78
Software Systems Testing	80
Semester 5 – Systems Development Option	82
Project I	82
Integrative Programming and Technologies	84
Intelligent Systems.....	86
Applications Development	88
User Interface Design	90
Semester 6 – Systems Development Option	92
Project II	92
IT Law and Ethics	93
System Integration and Deployment.....	95
Information Systems Audit.....	98
Software Systems Testing	100
Semester 5 – Information Systems Management Option.....	102
Project I	102
Applications Development	103
Data Warehousing and Business Intelligence	105
Business Process Management	107

Information Systems Architecture	109
Semester 6 – Information Systems Management Option.....	112
Project II	112
IT Law and Ethics	113
Information Systems Strategy, Management and Acquisition.....	115
Information Systems Audit.....	118
Modelling and Simulation.....	120
11. Quality Assurance.....	123
11.1. Feedback from Students.....	123
11.2. Class Meetings	123
11.3. Use of ICT in Availing Lecture Materials	123
11.4. Peer Review	123
11.5. External Review	124
Appendix 1: Staff List	125
Appendix 2: Budget for BIST Program	129

1. Background to the School of Computing and Informatics Technology

The School of Computing and Informatics Technology (SCIT), is part of the College of Computing and Information Sciences at Makerere University. It is a major ICT training, research and consultancy centre in Uganda. The School grew out of the then Faculty of Computing and Informatics Technology following the Adoption of the collegiate system by Makerere University in 2010. The Faculty of Computing and Informatics Technology was earlier established by the University Council at its 100th meeting held on 15th December 2004 by upgrading the Institute of Computer Science into a Faculty with four Academic Departments, namely: Computer Science, Networks, Information Technology and Information Systems. The Institute of Computer Science, which was established by the University Council in 1985, grew out of the University Computer Centre.

SCIT has been running bachelor degree programs in Information Technology (BIT) and Information Systems (BIS). BIT degree programme started in academic year 2004/2005 and the BIS started in 2009/2010. The two programs were last reviewed in 2013. Following a review by the Academic Programs Restructuring Committee of Makerere University Senate, the two programs were recommended for a merger. The new Bachelor of Information Systems and Technology (BIST) here proposed is the merger of BIT and BIS programs.

To operationalize a recommendation by the Academic Programs Restructuring Committee of Makerere University Senate (April 2016), the committee was mandated to review academic programs for duplications, possible merger, economic viability, and relevance. The committee found that the BIT and BIS programs at the SCIT had similarity / overlap of course units and content of more than 40%. The committee further noted that the two programs produced graduates that competed for similar positions in the job market. These two programs were therefore recommended for a merger into one to address the redundancy.

Training and research in these two closely related areas of information technology and information systems are often overlapping. The BIST program offers the opportunity to create new synergies for training and research opportunities in the fields of information systems and information technology.

The BIST program is hosted by the department of Information Systems. Its course units are jointly offered by two academic departments at the School of Computing and Informatics Technology namely: the Department of Information System (IS) and that of Information Technology (IT).

Vision Statement

To be a leader in Computing, ICT training, and research services.

Mission Statement

To provide first class teaching, research, computing and ICT services responsive to national and international needs.

SCIT's Value Statement

To be an innovative and industry-oriented School, pursuing excellence in teaching, learning, cutting edge value-added research and consultancy, community outreach, as well as providing a vibrant student life.

2. The Bachelor of Information Systems and Technology Program

2.1 Target Group

The program targets two categories of entry schemes, namely Direct Entry and Diploma holders in relevant programs.

2.2 Nature of the Program

The day program has both government and privately sponsored students. The evening program has privately sponsored students only.

2.3 Duration

The duration of this program is three (3) academic years consisting of six semesters and two recess terms. Each semester lasts for seventeen (17) weeks out of which two (2) weeks are for examinations. The first and second years will in addition have a recess term of 10 weeks. For students without the Cisco Certified Networking Associate (CCNA) certification will take CCNA as an audited course during the first year recess term.

2.4 Tuition Fees

Tuition fees for privately sponsored students shall be UGX 3,200,000 Uganda Shillings per year for Ugandans (see appendix) and East African students and UGX 4,700,000 Uganda Shillings per year for International Students.

3. Program Description

The Bachelor of Information Systems and Technology (BIST) is a three year full-time Program open to all qualifying students, commencing in the 2017/2018 academic year.

The Program will be based on an effective curriculum, achieved through considering a number of factors that cover the opportunities, and gaps that need to be addressed by the BIST Program. These included;

- a) The requirements from the inter university council for East Africa's March 2015 benchmarks for developing curricula for bachelor of Information Technology Programs
- b) The internationally recognized ACM curriculum development guidelines for undergraduate degree programs in information systems and information technology
- c) A market analysis to evaluate the attractiveness and the dynamics of the Information Systems and Technology market within East Africa. Special attention was paid on the kind of jobs/roles being advertised within this market segment and the different skills set that are being sought
- d) Feedback obtained over a three year period (2013 - 2016) from our industrial partners where our students were placed for the Internship / field attachment.
- e) Consultations made with the ICT Association of Uganda.
- f) Industrial and alumni feedback: key stakeholders and experts from regulatory authorities, industry and academia were invited to provide insights as to what their expectations are of an Information Systems and Technology graduate.

The emphasis of this Program is on the ability of graduates to develop conceptual and practical IT skills and their application in communication, business problem solving and integration of organizational functions within the overall business strategy. The BIST program is thus designed to equip learners with the concepts, knowledge and skills required to build and manage robust computer information systems and electronic services that are properly aligned with organizational business strategy.

Graduates of this Program will take up positions related to functionalizing the Information and Communication Technology (ICT) domain in public and private sectors. Examples of these positions include: Web-Designers, Web-Programmers, Information Technology Planners, Systems Analysts, IT Project Managers, IT systems auditors, Information Systems Specialists, Security Specialists, Systems Administrators, Network Developers, Network Engineer and Forensics, Network Administration, Programming, Information Technology and Assurance. These competences cover the three broad areas of Information Technology Security, Systems Development and Information Systems Management.

3.1 Who is an Information Systems and Technology Graduate?

An Information Systems and Technology graduate is regarded as a person who provides an interface and translation between business and technology. He/she will function as a user advocate having the ability to select, create, apply, integrate and administer computing technologies to meet the needs of users within a societal and organizational context including government, business education, the non-profit sector, and healthcare among others.

The Program provides the graduate with basic foundational courses in IS and IT in the first two years. In the third year of training, students are given an opportunity to focus on any one of the three broad areas of: Information Technology Security, Information System Management and System Development. The Systems Development option of the program provides learners with a business practice framework for information systems development whereas the Information Technology Security option equips learners with skills required to perform administration of Network and mobile systems. On the other hand the Information Systems Management option provides learners with the knowledge and technical skills required to design and manage business information systems.

The BIST graduate is positioned at the third level of responsibility (Application Level) of the Skills Framework for the Information Age (SFIA). The SFIA is a model for describing and managing competencies for ICT professionals for the 21st century, and is intended to help match the skills of the workforce to the needs of the business.

At the application level, a graduate that is able to:

- a) Use discretion in identifying and responding to complex issues and assignments;
- b) Interact with and influence colleagues with good interpersonal skills
- c) Perform a range of work-sometimes complex and non-routine in a variety of environments
- d) Demonstrate an analytical and systematic approach to issue resolutions; and effective communication skills, team work, and planning
- e) Appreciate the wider business context and how their own role relates to other roles in the organization

4. Program Rationale

All aspects of the global computing field continue to face rapid and frequent change. The professional context in which the BIT and BIS graduate works has changed considerably over the decades and curricula need to reflect this change. University level curricula need frequent cyclic change to remain effective. The merger of the Bachelor of

Information technology and the Bachelor of Information Systems programs at SCIT reflects the need for the following:

- i). It is a requirement by the National Council for Higher Education (NCHE) for a periodic review of curricula based on program cycles: considering that the BIT and BIS programs were last reviewed in 2013. They had run for a cycle of three (3) years, and were due for review. The proposed BIST program is in line with this requirement.
- ii). A compelling argument for merging the two programs into one Bachelor of Information Systems and Technology (BIST) is a response to strong industry demand. Feedback from internship evaluation reports of the students by industry stakeholders consistently revealed a need by the IT and IS job market for more system developers, system security experts and information systems managers. Furthermore, the students from the two programs were not a ready workforce as characteristically they had strong theoretical knowledge but less skilled on the practical applicability of this knowledge. The BIST program is therefore demand driven and tailored to bridge this gap as well.
- iii). There is an increased demand for graduates equipped with knowledge and skills critical for success in the 21st century such as; life and career skills; learning and innovation skills; and information, media and technology skills. The BIST program (with its three areas of specializations) provides learners with essential skills to be at the cutting edge in the rapidly evolving digital economy. The curriculum is designed to educate graduates who are prepared to enter the workforce equipped with relevant knowledge, skills and competencies. The BIST program design separates the core of the curriculum from the electives with the intent of supporting the concept of career tracks.
- iv). The program is therefore designed to have a set of selected course units that enable a graduate to apply IT and IT skills in solving societal and organizational problems in such diverse fields as medicine, agriculture, commerce, tourism and environment among many others. The mode of delivery used in the program provides for learning, life, and career skills such as critical thinking, communication, collaboration, and creativity.

5. Program Objectives

The Bachelor of Information Systems and Technology (BIST) program aims to educate and develop students in broad and deep aspects of information systems and technology concerned with their implementation in a wide variety of organizational environments. It is designed to address the concerns of different stakeholders by focusing on a learner's academic ability, employability and personal development. Specifically, the Program seeks to:

1. Equip learners with the knowledge and skills required to learn, design, develop, install, and implement all types of computer information systems and technologies.
2. Provide learners with knowledge and innovative skills required to develop applications of Information Systems and Technology in a dynamic organizational environment.
3. Prepare learners for life-long learning and research in the area of Information Systems and Technology.
4. Connect learners to industry through placements and internships in the field of Information Systems and Technology.
5. Impart professional, legal, security, ethical and social awareness pertinent to Information Systems and Technology.
6. Equip the learner with soft skills and attitude to work as part of a team in multicultural, global, technical and non-technical environments.

6. Program Learning Outcomes

Upon successful completion of this Program, students should be able to:

6.1. Knowledge and Understanding

1. Demonstrate the knowledge, skills and competencies to learn, design, develop, install, and implement all types of computer information systems and technologies used in organizations.

6.2. Skills

2. Utilize the knowledge and innovative skills required to develop applications of Information Systems and Technology in a dynamic organizational environment.
3. Apply the soft skills and be able to work as part of a team in multicultural, global, technical and non-technical environments.
4. Pursue further studies and carry out research in the area of Information and Systems Technology.
5. Demonstrate application of knowledge and skills learnt in real practical setting.

6.3. Values and Attitudes

6. Demonstrate a considered appreciation of the necessary legal, security, ethical and professional values appropriate to the provision of information services.

7. Regulations

7.1. Admission Requirements

Direct Entry

A candidate must satisfy the general minimum entry requirements of Makerere University. Students' entry through 'A' level must have:

- At least two principle passes at advanced level of education
- At least five passes (with credits in English and Maths) at ordinary level in one sitting or its equivalent.

For purposes of computing weighted points, the advanced level subjects shall be grouped and weighted as follows:

Table 1: A level subjects used to compute weighted points for comparison with minimum weighted points

Group	Weight	Subjects
Essential	3	Two best done subjects from among: Mathematics, Physics, Economics, Chemistry, Biology and Geography, Entrepreneurship.
Relevant	2	Any other best one done subject of all A level subjects
Desirable	1	General Paper, Sub-Mathematics, Computer Studies
Others	0.5	All others

Diploma Holders

Applicants should possess at least a second class (lower division) Diploma in Computer Science, Diploma in Information Technology, CCNA, or any other Diploma with Business or Computing aspects or equivalent performance from recognised institutions by the Makerere University Senate / National Council of Higher Education.

Mature Age Entry

Under the Mature Age Entry Scheme, the following are the major Policies;

- a) For a candidate to qualify for entry to the University he/she MUST sit and pass the university Mature Age Entry Examinations.

- b) To be eligible to the Mature Age Entry Examinations, the candidate MUST be at least 25 years old before 1st August of the year in which admission is sought.
- c) No candidate who had previously attended a programme at Makerere University shall be re-admitted to the University under this scheme to a programme of study in which he/she failed to qualify during his/her previous attendance.

7.2. Progression

Progression shall be regarded as normal, probationary, or discontinuation as per the standard Makerere University Senate guidelines.

7.2.1. Normal Progress

This occurs when a student passes each course taken with a minimum Grade point of 2.0

7.2.2. Probationary Progress

This is a warning stage and occurs if either the cumulative grade point average (CGPA) is less than 2.0 and / or the student has failed a core course. Probation is waived when these conditions cease to hold.

7.2.3. Discontinuation

When a student accumulates three consecutive probations based on the CGPA or the same core course(s), he / she shall be discontinued.

7.2.4. Retaking 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.

7.3. Weighting System

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

7.4. Semester Load and Minimum Graduation Load

The normal semester load is between 15 to 21 credit units. The minimum graduation load is one hundred twenty three (123) credit units. The core courses in the first four semesters (year 1 plus year 2) contribute eighty seven (87) credit units to the graduation load. Each of the three tracks (in year 3) contributes thirty six (36) credit units to the graduation load.

7.5. Course Assessments

Each Course will be assessed on the basis of 100 total marks with proportions as follows defined under each course: Course work – 40%; Examination – 60%

A minimum of two course assignments / tests shall be required per course. Course work shall consist of individual tests, group assignments (case studies, field studies, mini projects, and presentations) in each semester.

7.6. Grading of Courses

Each course will be graded out of a maximum of 100 marks and assigned an appropriate letter grade and a grade point. Courses given for each Program shall be appropriately weighted and scores in students' Grade Point Average (GPA) shall be a result of assigned grades as set out in the following table using a five point rating system in averaging the final grade of a graduate

Table 2: Letter Grades and Grade Points for final Course marks

Marks (out of 100%)	Letter Grade	Grade Point
90 – 100	A+	5
80 – 89	A	5
75 – 79	B+	4.5
70 – 74	B	4
65 – 69	C+	3.5
60 – 64	C	3
55 – 59	D+	2.5
50 – 54	D	2
45 – 49	E	1.5
40 – 44	E-	1
Below 40	F	0

The following additional letters will be used, where appropriate:

W – Withdrawal from Course;

I – Incomplete;

AU – Audited Course Only;

P – Pass;

F – Failure.

Classification of Award for Degrees and Diplomas

The classification of awards of degrees and diplomas shall be as set out in the following table:

CLASS	CGPA RANGE
First Class	4.40 - 5.00
Second class (upper division)	3.60 - 4.39
Second class (lower division)	2.80 - 3.59
Pass	2.00 - 2.79

7.7. Minimum Pass Mark

A minimum pass grade for each course shall be 2.0 Grade Points.

7.8. Calculation of Cumulative Grade Point Average (CGPA)

The Cumulative Grade Point Average (CGPA) shall be calculated as follows:

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

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 done so far.

7.9. Knowledge Areas in the BIST Program

The curriculum is based on 09 broad knowledge areas that make up practical and resourceful Information Systems and Technology specialists. The Association of Computing Machinery (ACM) was used as a basis for the identification of these knowledge areas. The different course units in the curriculum have been categorized under each knowledge area.

1. Soft Skills
 - a. CSK 1101 Communication Skills
 - b. BAM 2102 Entrepreneurship Principles
 - c. IST 3203 IT Law and Ethics
2. Programming and Software Development
 - a. CSC 1107 Structured Programming
 - b. IST 1204 Systems Analysis and Design
 - c. CSC 1214 Object Oriented Programming
 - d. IST 3108 Applications Development
 - e. IST 3106 Integrative Programming and Technologies
 - f. IST 2102 Web systems and Technologies I
 - g. IST 2205 Web systems and Technologies II
 - h. CSC 3110 User Interface Design
3. Mathematical Foundations
 - a. MTH 1110 Basic Mathematics
 - b. IST 1201 Applied Business Statistics
4. Data Modelling and Management
 - a. IST 1203 Data and Information Management I
 - b. IST 2101 Data and Information Management II
 - c. IST 3109 Data Warehousing and Business Intelligence
5. Net Centric Systems
 - a. CSC 1303 Cisco Certified Network Associate (CCNA)
 - b. IST 1202 Introduction to Computer Networks
 - c. IST 3103 Enterprise Network Management
 - d. IST 2201 System Administration
6. Systems Security
 - a. IST 2103 Information Systems Security and Risk Management
 - b. IST 3204 Information Systems Audit

- c. IST 3202 Ethical Hacking
- d. IST 3105 Digital Forensics Investigation
- e. IST 3104 Intrusion Detection and Incident Management
- f. IST 3102 Network Security
- 7. Research and Development
 - a. IST 2203 Research Methodology
 - b. CSC 1304 Practical Skills Development
 - c. IST 2302 Field Attachment
 - d. IST 3101 Project I
 - e. IST 3201 Project II
 - f. IST 1102 Emerging Trends in Information Systems and Technology
- 8. Information Systems Development, Management and Application
 - a. IST 1101 Foundations of Information Systems and Technology
 - b. IST 2204 IST Project Management
 - c. CSC 1109 Computer Literacy
 - d. IST 3206 System Integration and Deployment
 - e. IST 3207 Information Systems Strategy, Management and Acquisition
 - f. IST 3112 Information Systems Architecture
 - g. IST 3205 Software Systems Testing
 - h. IST 2202 E-Services
 - i. IST 2104 Electronic Media Systems and Multimedia
- 9. Systems Modelling
 - a. IST 3111 Business Process Management
 - b. IST 3208 Modelling and Simulation
 - c. IST 3107 Intelligent Systems

8. Resources and Infrastructure

The School of Computing and Informatics Technology has sufficient resources and infrastructure to suitably run the program as further described below:

8.1. Sources of Funds

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

8.2. Staff

The School of Computing and Informatics Technology has adequate, highly qualified and experienced staff (see list of staff members and their qualifications in Appendix A) that will competently teach the courses in the BIST Program.

8.3. Lecture Space

The School of Computing and Informatics Technology is housed in the College of Computing and Information Sciences with 2,500 and 12,000 square meter buildings known as block A and B, respectively. Block A mainly accommodates offices for the administration and teaching staff. The ground floor has a conferencing facility co-shared with AMITY University; on second floor there are two teaching labs, a lecture room and

two seminar rooms used for teaching purposes as well. On fourth floor, there is a seminar room and a conference hall and the sixth floor has a testing centre. Block B has lecture rooms together with the rest of the general and specialized laboratories i.e. Software Centre, Multimedia lab, Mobile Applications among others. The two buildings sufficiently cater for all the lecture and laboratory space requirements at the College of Computing and Information Sciences (CoCIS). Specifically CoCIS has twelve lecture theatres each of 200 square meters (300 seat capacity) of circulation space where students are able to access other services such wireless Internet services.

8.4. Computer Laboratories and Software

The CoCIS buildings that house CIT, i.e. Block A and B, have general computing laboratories (for student hands-on training); teaching and specialized laboratories, that are shared amongst the four departments. The School has 7 laboratories each of 800 square meters (1000 seat capacity) and six small laboratories of total area 1200 square meters with a total of approximately 700 computers. All computers in the laboratories are pre-installed with various operating systems and computing applications with a focus on open source applications.

Additionally, the School has approximately 3500 students, which makes the student to computer ratio 1:3. This is adequate for the practical components of the curriculum. Moreover, computers are pre-installed with open source operating systems and applications. The School therefore has access to software for the practical aspects of the Program.

8.5. Library Services

Makerere University library supports the College of Computing and Information Science library, which is located on the first level of Block B. The College Library is stocked with up-to-date information resources. The information resources in the College Library have been acquired through purchases made by Makerere University Library and the College of Computing & Information Sciences. Additionally, the University Library provides access to print books, print journals, electronic journal databases, a well-stocked reference section and connections to many online databases like the Uganda Scholarly Digital Library at <http://dspce3.mak.ac.ug>. The print collection is beefed up by the broad variety of electronic resources provided by the University Library and accessible online at <http://muklib.mak.ac.ug>. Through the document delivery service, users who fail to get access to full-text articles from the available databases can make requests for articles, which are delivered, to them at no cost. Library users can also access the Online Public Access Catalogue (OPAC) to get bibliographic information about the collections found in the College Library at <http://196.43.133.123:8080>.

8.6. Number of Students

Given the above resources, the programme can support an intake of up to 400 students per year. Of this, 200 are for the day programme. Another 200 are for the evening program.

9. Program Structure

As a base for the curriculum development, we used the international industry standard for Information Systems and Information Technology undergraduate Programs i.e. the National Council for Higher Education, the ACM Computing curricula guidelines for undergraduate Programs in Information Systems 2010, and the ACM “Computing Curricula Information Technology Volume” respectively. The prospective BIST students of the School of Computing and Informatics Technology are expected to have basic computer literacy upon entry which will be further supplemented with a course on Computer Literacy which has been added in the curricula.

9.1. Course Outline

The degree Program will extend over a period of three years. An academic year shall consist of two semesters of 17 weeks (15 weeks for classes and 2 weeks for examinations). The first and second years will in addition have a recess term of 10 weeks. For students without the Cisco Certified Networking Associate (CCNA) certification will take CCNA as an audited course during the first year recess term. A full-time student shall not carry less than 15 credit units and not more than 21/25 credit units per semester. All the students must make extensive use of the computing facilities outside the scheduled lecture, tutorial and practical hours. The details of the course structure are shown below, where LH, TH, PH, CH and CU stand for Lecture Hours, Tutorial Hours, Practical Hours, Contact Hours and Credit Units respectively.

The program consists of 50 course units; out of which three (3) are new and twenty eight (28) are modified. Of these, 21 course units had their content revised and 7 were modified by credit units. There are two (2) audited courses. There are seventeen (17) old courses which have been adopted from the previous IT and IS programs.

Key:

1. **Modified:** This remark means that the course unit has been revised by content.
2. **Star on Course Code:** This means the course unit has been modified only by credit units and not by content.
3. **New:** Means the course unit has been freshly introduced in the department
4. **Old:** Means no change on the course unit's name, code and content"
5. **Audited:** This means that the course does not contribute to the graduation load.

Year 1 Semester I (5 Courses)

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (5 core courses)									
IST 1101	Foundations of Information Systems and Technology	45	30	--	60	4	Core	Modified	IS
CSK 1101	Communication Skills	45	30	--	60	4	Core	Old	Lang.
IST 1102	Emerging Trends in Information Systems and Technology	45	--	30	60	4	Core	Modified	IS
CSC 1107	Structured Programming	45	30	--	60	4	Core	Old	CS
MTH 1110	Basic Mathematics	30	--	30	45	3	Core	Old	MTH
Audited course:									
CSC 1109	Computer Literacy	30	60	--	60	4	Audited	Old	CS
Total CU						19			

Year 1 Semester II (5 Courses)

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (5 core courses)									
IST 1201	Applied Business Statistics	30	30	30	60	4	Core	Modified	IS
IST 1202	Introduction to Computer Networks	45	30	--	60	4	Core	Old	IS
IST 1203	Data and Information Management I	30	60	--	60	4	Core	Modified	IS
IST 1204	Systems Analysis and Design	30	30	30	60	4	Core	Modified	IS
CSC 1214	Object Oriented Programming	30	60	--	60	4	Core	Old	CS
Total CU						20			

Year 1: Recess Term

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
CSC 1303	Cisco Certified Network Associate	--	150	--	75	5	Audited	Old	CS
CSC 1304	Practical Skills Development	15	90	30	75	5	Core	Old	CS
Total CU						5			

Year 2 Semester I (5 Courses)

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (5 core courses)									
IST 2101	Data and Information Management II	30	60	--	60	4	Core	Old	IS
IST 2102	Web Systems and Technologies I	45	30	--	60	4	Core	Old	IT
BAM 2102	Entrepreneurship Principles	30	--	30	45	3	Core	Modified	Bus
IST 2103	Information Systems Security and Risk Management	30	30	--	45	3	Core	Old	IS
IST 2104	Electronic Media Systems and Multimedia	45	30	--	60	4	Core	Old	IT
Total CU						18			

Year 2 Semester II (5 Courses)

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (5 core courses)									
IST 2201	System Administration	45	30	--	60	4	Core	Modified	IT
IST 2202	E-services	30	30	--	60	4	Core	Modified	IS
IST 2203	Research Methodology	45	--	30	60	4	Core	Old	IT
IST 2204	IST Project Management	45	30	--	60	4	Core	Old	IT
IST 2205	Web Systems and Technologies II	30	30	30	60	4	Core	Old	IT
Total CU						20			

Year 2: Recess Term

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
IST 2302	Field Attachment	--	150	--	75	5	Recess	Old	IS
Total CU						5			

Year 3 Semester I (5 Courses) – Information Technology Security Option

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (5 core courses)									
IST 3101	Project I	45	30	30	75	5	Core	Modified	IT
IST 3102	Network Security	30	30	30	60	4	Core	New	IT
IST 3103	Enterprise Network Management	45	30	--	60	4	Core	Modified	IT
IST 3104	Intrusion Detection and Incident Management	45	30	30	60	4	Core	New	IT
IST 3105	Digital Forensics Investigation	45	30	30	60	4	Core	Modified	IT
Total CU						21			

Year 3 Semester II (4 Courses) – Information Technology Security Option

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (3 core courses)									
IST 3201	Project II	--	100	50	75	5	Core	Modified	IT
IST 3202	Ethical Hacking	45	30	--	60	4	Core	New	IT
IST 3203	IT Law and Ethics	30	--	30	45	3	Core	Old	IT
Electives: (1 Course)									
IST 3204	Information Systems Audit	30	30	--	45	3	Core	Old	IS
IST 3205	Software Systems Testing	30	30	--	45	3	Core	Old	IS
Total CU						15			

Year 3 Semester I (5 Courses) – Systems Development Option

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (5 core courses)									
IST 3101	Project I	45	30	30	75	5	Core	Modified	IT
IST 3106	Integrative Programming and Technologies	30	30	30	60	4	Core	Old	IT
IST 3107	Intelligent Systems	45	30	--	60	4	Core	Modified	IS
IST 3108	Applications Development	30	30	30	60	4	Core	Modified	IS
CSC 3110	User Interface Design	30	30	30	60	4	Core	Modified	CS
Total CU						21			

Year 3 Semester II (4 Courses) – Systems Development Option

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (3 core courses)									
IST 3201	Project II	--	100	50	75	5	Core	Modified	IT
IST 3203	IT Law and Ethics	30	--	30	45	3	Core	Old	IT
IST 3206	System Integration and Deployment	30	30	30	60	4	Core	Old	IT
Electives: (1 course)									
IST 3204	Information Systems Audit	30	30	--	45	3	Core	Old	IS
IST 3205	Software Systems Testing	30	30	--	45	3	Core	Old	IS
Total CU						15			

Year 3 Semester I (5 Courses) – Information Systems Management Option

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (5 core courses)									
IST 3101	Project I	45	30	30	75	5	Core	Modified	IT
IST 3108	Applications Development	45	30	--	60	4	Core	Modified	IS
IST 3109	Data Warehousing and Business Intelligence	30	30	30	60	4	Core	Old	IS
IST 3110	Business Process Management	30	30	30	60	4	Core	Old	IS
IST 3111	Information Systems Architecture	45	30	--	60	4	Core	Modified	IS
Total CU						21			

Year 3 Semester II (4 Courses) – Information Systems Management Option

Course Code	Course Name	LH	PH	TH	CH	CU	Type	Remark	Host dept
Cores: (3 core courses)									
IST 3201	Project II	--	100	50	75	5	Core	Modified	IT
IST 3203	IT Law and Ethics	30	--	30	45	3	Core	Old	IT
IST 3207	Information Systems Strategy, Management and Acquisition	45	30	--	60	4	Core	Old	IS
Electives: (1 Course)									
IST 3204	Information Systems Audit	30	30	--	45	3	Core	Old	IS
IST 3208	Modelling and Simulation	30	30	--	45	3	Core	Old	IS
Total CU						15			

The Graduation Load

The minimum graduation load is one hundred twenty three (123) credit units. The core courses in the first four semesters (year 1 plus year 2) contribute eighty seven (87) credit units to the graduation load. Each of the three tracks (in year 3) contributes thirty six (36) credit units to the graduation load.

10. The Detailed Curriculum

Semester 1

Foundations of Information Systems and Technology

Course name:	Foundations of Information Systems and Technology
Course code:	IST 1101
Course level:	Year 1 Sem I
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	None

Course Description:

This course is designed to provide BIST students with an overview of the IST discipline so that they are grounded in fundamental aspects of Information Systems and Technology. To achieve that, the course is divided into two parts. The first part exposes students to contemporary information systems and demonstrates how these systems are used throughout global organizations. The focus of the first part is on key components of information systems – people, software, hardware, data, and communication technologies and how these can be integrated and managed to create competitive advantage. Through the knowledge of how Information Systems provide a competitive advantage, students will gain an understanding of how information is used organizations and how IT enables improvements in quality, speed, and agility. The second part of the course exposes students to IT infrastructure and covers topics related to both computer and systems architecture and communication networks, with an overall focus on the services and capabilities that IT infrastructure solutions enable in an organizational context.

Course Objectives:

Part 1

1. To expose students to the technology, people, and organizational components of information systems, and how and why information systems are used today.
2. To expose students to the value of information systems investments, and how businesses are using them for competitive advantage.

3. To expose students to how information systems are enabling new forms of communication, collaboration, and partnering.
4. To expose students to how various types of information systems provide the information needed to gain business intelligence to support decision making for different levels and functions of the organization.
5. To expose students to how enterprise systems foster strong relationships with customers and suppliers and how these systems are widely used to enforce organizational structures and processes.

Part 2

1. To expose students to the principles underlying layered systems architectures and their application to both computers and networks.
2. Expose students to the differences and similarities between the core elements of an IT infrastructure solution, such as clients, servers, network devices, wired and wireless network links, systems software, and specialized security devices.
3. Expose students to how IT infrastructure components are organized into infrastructure solutions in different organizational environments.
4. Expose students to the components and structure of a large-scale organizational IT infrastructure solution at a level that allows them to use it effectively; the role of IT control and service management frameworks in managing large scale organizational IT infrastructure and solution and opportunities that virtual computing service models, such as cloud computing create for organizations.

Course Learning Outcomes:

Part 1

By the end of this course unit, students should be able to:

1. Describe the technology, people and organizational components of information systems, and how and why information systems are used today.
2. Describe the value of information systems investments and explain correctly how businesses are using information systems for competitive advantage.
3. Explain how information systems are enabling new forms of communication, collaboration, and partnering.
4. Describe how various types of information systems provide the information needed to gain business intelligence to support decision making for different levels and functions of the organization.
5. Explain correctly how enterprise systems foster strong relationships with customers and suppliers and how these systems are widely used to enforce organizational structures and processes.

Part 2

By the end of this course unit, students should be able to:

1. Describe key principles underlying layered systems architectures and their application to both computers and networks.
2. Describe the differences and similarities between the core elements of an IT infrastructure solution, such as clients, servers, network devices, wired and wireless network links, systems software, and specialized security devices.

3. Describe how IT infrastructure components are organized into infrastructure solutions in different organizational environments
4. Describe the components and structure of a large-scale organizational IT infrastructure solution at a level that allows organizations the solution effectively.
5. Describe the role of IT control and service management frameworks in managing a large-scale organizational IT infrastructure solution.
6. Identify opportunities that virtual computing service provision models, such as cloud computing create for organizations.
7. Analyze and understand the security and business continuity implications of IT infrastructure design solutions.

Indicative Content:

Part 1

1. Characteristics of the digital world	2 Hours
2. Information Systems components	3 Hours
3. Information Systems in Organizations	3 Hours
4. Globalization	3 Hours
5. Information Systems Infrastructure	3 Hours
6. Valuing information systems	2 Hours
7. Information systems for supporting decision making for different levels and functions of an organization	4 Hours
8. Enterprise-wide information systems	4 Hours

Part 2

1. Core computing system architecture concepts	3 Hours
2. Core computing system organizing structures	3 Hours
3. Core technical components of computer based systems	3 Hours
4. Role of IT infrastructure in a modern organization	3 Hours
5. Role of IT control and service management frameworks	3 Hours
6. Ensuring business continuity	2 Hours
7. Grid computing, cloud computing, computing as a service	4 Hours
8. Purchasing of IT infrastructure technologies and services	3 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Problem-based/case studies
5. Project-based assignments that can be done in groups

Mode of Assessment:

- Course work 40%
- Final written exam 60%

Reading List:**Part 1**

1. Stair, R. & Reynolds, G. (2013). *Foundations of Information Systems*, 7th Edition. Publisher: Cengage South-Western.
2. Stair, R. & Walter, R. G. (2009). *Principles of Information Systems: A managerial approach*, 9th Edition. Publisher: Cengage Learning.
3. Zwass, V. (1997). *Foundations of Information Systems*. Publisher: McGraw Hill.
4. Valacich J. and Schneider, C. (2012). *Information Systems Today*, 5th Edition. Publisher: Prentice Hall.

Part 2

1. Laan, S. (2011). *IT infrastructure architecture – Infrastructure building blocks and concepts*. 1st Edition. Publisher: Lulu Press Inc.
2. Choubey, M. K. (2012). *IT Infrastructure and Management*. 1st Impression. Publisher: Dorling Kindersley (India).
3. Gupta, P. Prakash, S., & Jayaraman, U. (2010). *IT Infrastructure and its management*. 2nd Reprint.

Proposed Course Facilitator(s)

1. Dr. Josephine Nabukenya
2. Ms. Irene Arinaitwe
3. Ms. Lillian Komugisha

Communication Skills

Course Name:	Communication Skills
Course Code:	CSK 1101
Course Level:	Year 1 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	None

Course Description:

This course provides students with skills of effective communication. These will mainly include verbal and written skills. The course aims at enabling the students communicate appropriately and effectively with society.

Course Objectives:

The aims of the course unit are majorly to:

1. Improve the communication competencies of the students
2. Improve problem solving strategies of students
3. Improve the art of critical thinking within the student
4. Improve the student's ability to collect and synthesize information
5. Provide students with knowledge to utilize the library and other educational resources effectively.

Course Learning Outcomes:

On completion of the course, the students shall be able to:

1. Communicate competently on various aspects of IT
2. Demonstrate problem solving strategies on a range of IT issues
3. Demonstrate the art of critical thinking on IT subjects
4. Independently collect and synthesize information on IT related issues
5. Utilize the library and other educational resources effectively.

Indicative Content

1. Writing Skills: Thinking critically/ selectively before the writing process; selecting the relevant details; organizing the relevant details logically; Writing the reports essays, letters and taking notes in appropriate register; Avoiding ambiguities, fallacies, irrationalities; Providing supportive evidence; Editing documents, proof reading; Writing and expanding information; Quoting and citing references; Writing a curriculum vitae.	20 Hours
2. Reading Skills: The use of skimming; scanning inference and prediction in reading; Intensive and critical reading; Acquisition of specific reading skills; Interpretation of non linear texts; Locating information and comprehension.	20 Hours
3. Speaking and Listening Skills to Enhance Effective Public Relations: The art of persuasion in effective speaking; Conducting interviews; Conducting meetings; Participating in group discussions and tutorials; Non verbal communication clues; Presentation seminars, seeking clarification etc.; Expression of politeness; Public speaking; Proper listening skills.	20 Hours
TOTAL HOURS	60 Hours

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Practical sessions (demonstrations)

Mode of Assessment:

Assessment will be in form of:

- | | |
|--------------------------|-----|
| 1. Coursework | |
| a. Tests | 20% |
| b. Individual assignment | 20% |
| 2. Final examination | 60% |

Reading List:

1. Bennie, B. (2005) 101 ways to improve your communication skills instantly 4th edition
2. Peggy, K. (2008). The hard Truth About soft skills: Work Place Lessons Smart People wish they had learned sooner.
3. Grant, A.E. Meadows, Focal J.H. (2008).Communication Technology Update and Fundamentals ,Focal Press'
4. Mirabito, M. & Morgenstern, B. (2004). The New Communications Technologies, Fifth Edition: Applications, Policy, and Impact.
5. Mirabito, M., Morgenstern, B. & Erlbaum L. (2006). Communication Technology and Social Change: Theory and Implications (Lea'sCommunication Series.

Proposed Course Facilitator(s)

1. Dr. Evelyn Kigozi Kahiigi
2. Mr. Davis Rwabu

Emerging Trends in Information Systems and Technology

Course Name:	Emerging Trends in Information Systems and Technology
Course Code:	IST 1102
Course Level:	Year 1 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	None

Course Description

Information system is a growing area. Many new things are coming up while also old things are getting modernized. This course will enable the students explore the trends of developments in the theory and practice of information systems. Students will both be taught and guided to explore the trends of developments in the literature.

Course Objectives

The objectives of the course are:

1. To widen the students understanding of the IS field
2. Get in depth understanding of the core aspects of IS
3. To strengthen the research skills

Course Learning Outcome:

By the end of this course, students should

1. Have an understanding of the current developments in information systems theory, research and practice.
2. Be able to sufficiently do guided study in an area of IS

Indicative Content:

Topics focusing on emerging technologies. This will include (but not limited to)

1. Social Networks	12 Hours
2. Web 2.0	12 Hours
3. Mobile Computing	12 Hours
4. Cloud Computing	12 Hours
5. Cybernetics	12 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Problem-based/case studies
5. Project-based assignments that can be done in groups

Mode of Assessment

- | | |
|---------------------------------------|-----|
| 1. Assessment shall be by assignments | 40% |
| 2. Final examinations | 60% |

Reading List

1. Becker, J. Kozyrev, O. Babkin, E. & Taratukin, V. (2015). Emerging Trends in Information Systems: Recent Innovations, Results and Experiences Springer 25, 2015 ISBN-10: 3319239279
2. Chandrasekaran, K. (2014) Essentials of Cloud Computing, Chapman and Hall/CRC, Print ISBN: 978-1-4822-0543-5, eBook ISBN: 978-1-4822-0544-2
3. Erl, T. Mahmood, Z. Puttini, R. (2013) Cloud computing : concepts, technology & architecture, Upper Saddle River, NJ : ServiceTech Press, Print ISBN: 9780133387520s

Proposed Course Facilitator(s)

1. Dr. Aminah Zawedde
2. Dr. Rehema Baguma

Structured Programming

Course Name: Structured Programming
Course Code: CSC 1107
Course Level: Year 1 Sem 1
Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: MTH 1110 Basic Mathematics

Course Description

This course will create a strong base in the principles and practice of functional programming. A high level programming language like C will be used in this course. Students will cover both theoretical principles and hands on practical skills. The main concepts to cover include program structure, data structures, syntactical and semantic correctness, planning and segmentation in programming as well as working with files.

Course Objectives

The aims of the course are to provide the student with:

1. Comprehensive knowledge about structured oriented programming;
2. Knowledge in planning and organization of programming projects;
3. Knowledge and techniques of evaluating syntactic and semantic correctness of a computer program;
4. Strong practical basis in programming.

Course Learning Outcomes

Students who successfully complete this course of study will be able to:

1. Understand the basic terminology used in structured oriented programming
2. Write, compile and debug programs in C language
3. Use different data types in a computer program
4. Design programs involving decision structures, loops and functions
5. Use different data structures and create/update basic data files

Indicative Content

1. Program Structure	8 Hours
2. Variables and Operators	4 Hours
3. Conditional Statements	8 Hours
4. Looping Statements	4 Hours
5. Arrays and Strings	8 Hours
6. Functions	8 Hours
7. Advanced data types	4 Hours
8. Pointers	8 Hours
9. Dynamic memory allocation and dynamic structures	4 Hours
10. Working with files	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books and online resources

Mode of Delivery

1. Practicals.
2. Lectures
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment

- | | |
|--------------------------------------|-----|
| 1. Practical assignment and one test | 40% |
| 2. Practical exam | 30% |
| 3. Final written examination | 30% |

Reading List

1. Kernighan, B.W. & Ritchie, D. M. (2000) *C Programming Language* Prentice Hall.
2. Harrison, S. P. (2002) *C: A Reference Manual* (5th Edition). Prentice Hall, 2002.
3. Bäckman, K. (2008) *Structured Programming with C++*.
4. Hughes, J. K. (1986). *PL/I Structured Programming*
5. Dahl, O. Dijkstra, E.W. Antony, C. & Hoare, R. (2010) *Structured Programming*. ACM Digital Library

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Mr. John Kizito
3. Mr. Emmanuel Mugejjera

Basic Mathematics

Course Name:	Basic Mathematics
Course Code:	MTH 1110
Course Level:	Year 1 Sem 1
Contact Hours:	45
Credit Units:	3 CUs
Pre-requisite Courses:	None

Course Description:

This course is designed to provide a general overview of selected mathematical concepts with useful everyday life applications. The course is also designed to develop the ability to think critically, and to realize that the proper use of logic is a reasonable

way to solve problems. Topics include: numbers, equations, logic and set theory, statistics and probability, graphs, sets, vectors, and functions.

Course Objectives:

The aims of the course unit are majorly to:

1. Introduce students to basic ideas of mathematics such as formal mathematical reasoning techniques
2. Improve the basic counting techniques and their applications for information systems students
3. Develop and improve the art of critical thinking within the student
4. Demonstrate understanding of basic ideas of mathematics
5. Develop knowledge on how to relate mathematical problems to real world situations

Course Learning Outcomes:

By the end of this course, students should be able to:

1. Have the basic mathematical knowledge required to undertake the Bachelor of Information Systems course
2. Demonstrate understanding of the basic counting techniques and their applications for information systems students
3. Demonstrate critical thinking in mathematical related situations.
4. Perform problem solving using basic mathematical tools
5. Relate mathematical problems to real world situations while coming up with appropriate solutions.

Indicative Content:

1. Numbers: natural numbers, integers, prime numbers, rational and irrational numbers, sequences, fractions, simple algebraic statements, estimates and approximations, ratios, direct and indirect proportions, percentage increases and decreases, simple and compound interest.	9 Hours
2. Algebra: multiplying, adding and subtracting algebraic expressions. Expanding brackets. Factor theorem. Multiplying, dividing, adding, and subtracting algebraic fractions.	6 Hours
3. Equations: solving a quadratic equation by factorization by completing the square and by formula. Solving simultaneous equations.	6 Hours
4. Logic and set theory introduction: propositions, negations, disjunction, conjunction, conditional, bi-conditional and truth tables.	6 Hours
5. Statistics and probability: bar charts, pie-charts, histograms, cumulative frequency, mean, mode, median, frequency table, scatter graphs, probability of single and combined events.	6 Hours
6. Coordinate geometry: Cartesian coordinates, the length, midpoint and gradient of a line joining two points. The equation of a straight line in the form of $y = mx + c$. Finding the equation of a straight line.	6 Hours

Drawing accurate graphs, coordinates, and constructing tables of values.	
7. Sets, vectors, and functions: language notation, Venn diagrams, inverse functions, composite functions, logical problems, vector addition, multiplication by scalar, column vectors and parallel vectors.	6 Hours
TOTAL HOURS	45 HOURS

Study Materials

Text books and online resources

Mode of Delivery:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Problem-based/case studies

Mode of Assessment:

- | | |
|-----------------------|-----|
| 1. Course work | |
| a) Tests | 20% |
| b) Assignments | 20% |
| 2. Final written exam | 60% |

Reading List:

1. William M, Beaver R.J, & Barbara M. B, (2013). *Introduction to Probability and Statistics*. 14th Edition. Publisher: Brooks/Cole.
2. Linda .B, Suzanne .C, (2000). *Core Maths for Advanced Level*. Publisher: Nelson Thornes.
3. Backhouse J.K., Houldsworth S.P.T, & Horril P.J.F. (1985). *Pure Mathematics*. Publisher: Longman.
4. Robert R. Stoll, (1979). *Set Theory and Logic*.

Proposed Course Facilitator(s)

1. Dr. Agnes Rwashana Semwanga
2. Mr. Mark Magumba

Computer Literacy

Course Name: Computer Literacy
Course Code: CSC 1109
Course Level: Year 1 Sem 1
Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: None

Course Description:

In this course, students are to learn about the basic organization, concepts and terminologies in a computerized environment. They are also to get an in depth understanding of common computer applications. The use of related applications in different operating systems will be explored.

Course Objectives:

The aims of the course unit are to:

1. Equip students with basic knowledge about computer organization;
2. Equip students with skills of using common office applications;
3. Expose students to different operating systems;
4. Equip students with skills of how to use the Internet;
5. Equip students with knowledge about common text editors in different operating systems.

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Describe the different parts of a computer;
2. Describe the historical evolution of computers;
3. Competently use the common office applications in at least two operating systems and;
4. Competently know how to use the Internet.
5. Competently use common text editors in at least two operating systems.

Indicative Content:

1. General computer organization	12 Hours
2. Historical perspectives of computing	8 Hours
3. Common Microsoft office packages	12 Hours
4. Office packages in other operating systems	8 Hours
5. Text editors	4 Hours
6. Common Command Line commands (Linux, Dos)	8 Hours
7. Using the web	4 Hours
8. Understanding the Internet	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books and online resources

Mode of Delivery:

1. Lectures
2. Practical sessions in the computer laboratories.
3. Online learning management systems
4. Class discussions and presentations

5. Problem-based/case studies
6. Project-based assignments that can be done in groups

Mode of Assessment:

The assessment will be in form of:

- | | |
|--------------------------|-----|
| 1. Tests | 20% |
| 2. Individual assignment | 20% |
| 3. Final written exam | 60% |

Reading List:

1. Preston, J. Preston, S. & Ferrett, R. (2012). *Computer Literacy: Computing Fundamentals*. Prentice Hall Press.
2. Williams, B.K. & Sawyer, S.C. (2007), *Using Information Technology; A practical introduction to computers & Communications*. Richard D Irwin.
3. Sawyer, S.C. & Williams, B. (2000). *Using Information Technology, Intro*. McGraw-Hill Higher Education.
4. Senn, J.A. (2004). *Information technology: principles, practices, and opportunities*. Prentice-Hall, Inc.
5. Snyder, L. (2008). *Fluency with information technology: Skills, Concepts, and Capabilities*. John Wiley & Sons, Inc.
6. Turban, E. Rainer, R.K. & Potter, R.E. (2005). *Introduction to information technology*. Wiley and Sons Inc.

Proposed Course Facilitator(s)

1. Dr. Fiona Tulinayo
2. Ms. Flavia Namagembe
3. Mr. Henry Sserugunda

Semester 2

Applied Business Statistics

Course Name: Applied Business Statistics
Course Code: IST 1201
Course Level: Year 1 Sem 2
Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: None

Course Description:

This course unit enables the student to: understand basic concepts of statistics, and be able to apply them in describing and interpreting business problems (or incidences that occur or incidences that are likely to occur in the business environment).

Course Objectives

1. The course aims at equipping students with skills that will enable them to use the various data collection techniques, and understand how gathered data is coded, captured, cleaned, analyzed, interpreted, and presented.
2. The course aims at equipping students with skills to enable them use tools such as SPSS, EPIINFO, MS Excel to perform statistical analysis of data associated with business operations and obtain meaningful information that can guide decision making.

Course Learning Outcomes:

1. The student will be able to appropriately apply basic tools of data gathering and data analysis to provide insight into business problems or business environments.
2. Students will be able to integrate basic tools of data gathering and analysis into an overall approach to scientific inquiry.

Indicative Content:

1. Designing effective data gathering instruments for capturing data and/or information on business operations or incidences that occur in business environments.	9 Hours
2. Procedure and Methods used to gather data using the data gathering instruments, determining suitable sample size, choosing a sampling method, drawing items or objects that constitute a sample.	12 Hours
3. Data analysis including ways students can analyze qualitative data and quantitative data, data coding, theme formulation (especially for qualitative data), data entry, data cleaning, preparing a data	15 Hours

analysis plan.	
4. Generating and interpreting descriptive statistics, statistical inference, probability distributions, and hypothesis testing, linear regression and correlation, and time series using SPSS, EPIINFO, STATA, MSEXcel etc	15 Hours
5. Scenarios showing how business statistics concepts can be applied in real and operational business environments	9 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Problem-based/case studies
5. Project-based assignments that can be done in groups

Mode of Assessment:

- | | |
|------------------------|-----|
| 1. Tests | 20% |
| 2. Mini survey project | 20% |
| 3. Final written exam: | 60% |

Reading List:

1. Anderson, D.R., Sweeney, D.J. & Williams, T.A. (2014). Modern business statistics with Microsoft Excel. Nelson Education.
2. Anderson, D.R., Sweeney, D.J., Williams, T.A., Camm, J.D., & Cochran, J.J. (2016). Statistics for business & economics. Nelson Education.
3. Sobol, M.G. & Starr, M.K. (1983). Statistics for business and economics: an action learning approach. McGraw-Hill.

Proposed Course Facilitator(s)

1. Dr. Agnes Nakakawa

Introduction to Computer Networks

Course Name: Introduction to Computer Networks
 Course Code: IST 1202
 Course Level: Year 1 Sem 2
 Contact Hours: 60
 Credit Units: 4 CUs
 Pre-requisite Courses: None

Course Description:

This course will cover Introduction to Computer Networks: definition, advantages, types, configurations; The OSI/ISO and TCP/IP reference models; Transmission media: magnetic media, twisted pair, coaxial, fiber-optics; satellite; Network Access Protocols; static versus dynamic channel allocation; LAN standards: 802.3 (Ethernet), 802.4 (token bus), 802.5 (token ring); Computer Network security, Active and Passive Attacks; Network layers, standards and protocols. Furthermore, the course ensures that students practically appreciate the use of computer (wired and wireless) networks.

Course Objectives

The aims of the course are:

1. To provide a solid foundation on the theoretical and practical understand of computer networks.
2. To introduce students to standards and guidelines in computer networks.
3. To impart knowledge and skill relevant for the design, implementation and maintenance of modern computer networks.
4. To introduce students to emerging computer networks technologies.

Course Learning Outcomes:

1. On completion of this course unit, the students will be able to:
2. Identify the terminologies and concepts of the OSI and the TCP/IP reference model;
3. Appreciate the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks;
4. Demonstrate knowledge of wireless networking concepts and tools;
5. Practically setup a network and trouble shoot it;
6. Demonstrate knowledge of network tools.

Indicative Content:

1. Introduction to Networks: definition, advantages, types, configurations; network topologies, types of networks	6 Hours
2. The OSI/ISO reference model; Transmission media: magnetic media, twisted pair, coaxial, fiber-optics	12 Hours
3. Packet switching, delay and loss concepts, physical media, protocol layering	6 Hours
4. Application layer: Web, E-mail, DNS, FTP	6 Hours
5. Transport layer: how UDP and TCP	6 Hours
6. Network layer and routing protocol basics, RIP , Ipv4 and Ipv6, addressing and CIDR	12 Hours
7. Computer Network security basics (ACL, Ipvsec, etc.)	6 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Lab experimentation
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

Assessment will be in terms of

- | | |
|--------------------------------------|-----|
| 1. Coursework (tests and Assignment) | 20% |
| 2. Group practical project | 20% |
| 3. Final examination | 60% |

Reading List:

1. Kurose, J.F & Ross, K.W. (2013). Computer Networking – A Top down Approach Featuring the Internet, 6th edition, Addison-Wesley, , ISBN 0- 132-85620-4.
2. Forouzan, B. A. (2007). Data communications and networking, fourth edition, ISBN 0-07-296775-7, McGraw-Hill
3. Peterson, L. & Morgan, B. D. (2003). Computer Networks: A Systems Approach Kauffmann Publishers, 3rd Edition.
4. Peterson, L.L. & Davie, B.S. (2011). Computer Networks: A Systems Approach
5. White, C.M. (2012). Data Communications and Computer Networks: A Business User's Approach,

Proposed Course Facilitator(s)

1. Dr. Johnson Mwebaze
2. Dr. Emily Bagarukayo

Data and Information Management I

Course Name:	Data and Information Management I
Course Code:	IST 1203
Course Level:	Year 1 Sem 2
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	IST 1101 Foundations of Information Systems and Technology, MTH 1110 Basic Mathematics

Course Description:

This course provides the students with an introduction to the core concepts in data and information management. It is centered around the core skills of identifying

organizational information requirements, modeling them using conceptual data modeling techniques, converting the conceptual data models into relational data models and verifying its structural characteristics with normalization techniques, and implementing and utilizing a relational database using an industrial-strength database management system.

Course Objectives:

The aims of this course are to:

1. Provide the students with systematic approaches to the design and implementation of databases
2. Equip students with hands on experience and knowledge in developing databases and management of data.

Course Learning Outcomes:

At the end of this course, students should be able to:

1. Demonstrate an understanding of the role of databases and database management systems in managing organizational data and information in the context of enterprise systems; the historical development of database management systems and logical data models; the basics of how data is physically stored and accessed & the fundamentals of the basic file organization techniques.
2. Capture the information requirements for an enterprise domain using at least one conceptual data modeling technique (such as entity-relationship modeling).
3. Design high-quality relational databases
4. Demonstrate an understanding of the purpose and principles of normalizing a relational database structure.
5. Implement a relational database design using an industrial-strength database management system, including the principles of data type selection and indexing using the data definition, data manipulation, and data control language components of SQL Understand the basic mechanisms for accessing relational databases

Indicative Content:

This course will in the preliminary cover operations like requirements gathering and database planning. The course will also introduce students to developing application programs that talk to a database. These applications may be online or offline. The course will also include the following topics:

1. Database approach	4 Hours
2. Types of database management systems	4 Hours
3. Basic file processing concepts and physical data storage concepts including file organizations techniques	4 Hours
4. Database Development Life Cycle	8 Hours
5. Conceptual data model (<i>Entity-relationship model</i>)	12 Hours
6. Logical Database Design (<i>Relational data model, database design, Mapping conceptual schema to a relational schema;</i>	12 Hours

<i>Normalization)</i>	
7. Physical database Design (<i>Physical data model; Indexing; Data types</i>)	4 Hours
8. Database development (<i>Database Languages: SQL</i>)	12 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

This course will be delivered through lectures, tutorials and laboratory Practicals. Students will be offered a range of experiences that include:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Problem-based/case studies
5. Project-based assignments that can be done in groups

Mode of Assessment:

Course work

- | | |
|---|-----|
| 1. Tests | 10% |
| 2. Take home assignments, practical exercises | 30% |
| 3. Final written exam | 60% |

Reading List:

1. Silberschatz, A. Korth, H.F. & Sudarshan. (2010). *Database Systems Concepts* (6th ed.). Publisher: McGraw-Hill.
2. Gordon, K. (2007). *Principles of Data Management: Facilitating Information Sharing*.
3. Connolly, T. & Begg, C. (2005). *Database Systems: A Practical Approach to Design, Implementation, and Management* (4th ed). Pearson Addison Wesley.
4. Connolly, T. & Begg, C. (2003). *Database Solutions: A Step by Step Guide to Building Databases* (2nd ed). Pearson Addison Wesley.
5. Greg, R. (2001). *Principles of Database Systems with Internet and Java Application*. Addison Wesley.

Proposed Course Facilitator(s)

1. Dr. Mercy Amiyo
2. Ms. Flavia Namagembe
3. Ms. Hasifah Namatovu

Systems Analysis and Design

Course Name:	Systems Analysis and Design
Course Code:	IST 1204
Course Level:	Year 1 Sem 2
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	IST 1101 Foundations of Information Systems and Technology

Course Description:

This course presents the processes, methods, techniques and tools that organizations use to build new information systems for their businesses, with particular focus on how computer-based technologies can most effectively contribute to the way business is organized. The course presents a systematic methodology for analyzing a business problem or opportunity, determining what role, if any, computer based technologies can play in addressing the business need. It articulates business requirements for the technology solution, specifies alternative approaches to acquiring the technology capabilities needed to address business requirements, and specifying the requirements for the information systems solution in particular. In- house development, development from third-party providers, or purchased commercial-off-the-shelf (COTS) packages are presented.

Course Objectives:

1. Introduce students to the different contemporary approaches used for the analysis and design of information systems
2. Equip students with the skills for initiating, specifying, and prioritizing information systems and Information Technology projects and for determining various levels of feasibility for these projects
3. Equip students with the different techniques commonly used to collect, analyze and document business requirements, in order to cause productive change in a way a business operates
4. Equip students with the different methodologies for designing and communicating a business solution to a problem using formal techniques, and contemporary case tools in process and data modeling
5. Equip students with the skills needed to manage information systems projects using formal project management methods.
6. Introduce students to various systems acquisition alternatives, including packaged systems, and outsourced design and development resources

Course Learning Outcomes:

At the end of this course, students should be able to:

1. Explain the different approaches used for the analysis and design of information systems

2. Demonstrate understanding of the initiation, specification and prioritization of information systems and Information Technology projects and their different levels of feasibility
3. Use contemporary techniques to collect, analyze and document business requirements, in order to cause productive change in a way a business operates
4. Use contemporary techniques for designing and communicating a business solution to a problem using formal techniques, and contemporary case tools for data modeling
5. Demonstrate understanding of the managing information systems projects using formal project management methods.
6. Explain the various systems acquisition alternatives, including packaged systems, and outsourced design and development resources

Indicative Content:

1. Introduction to Systems Analysis and Design. a) The different Analysis & Design Philosophies and Approaches for Information Systems: structured SDLC, UML, agile methods, soft systems methodology b) Managing Systems Projects. c) Configuration and Change Management	12 hours
2. Planning IT based projects a) Analysis of project feasibility b) Identification of opportunities for IT-enabled organizational change	4 hours
3. Analysis and Specification of System Requirements a) Analyzing of business requirements. b) Requirements Gathering c) Requirements Modelling. d) Data and Process Modelling.	12 hours
4. High-level System Design of Information systems a) User Interface Design b) Data Design. c) System Architecture.	12 hours
5. System Deployment and Implementation	8 hours
6. System Verification and Validation	8 hours
7. Managing Systems Support and Security	4 hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Practicals using CASE Tools
3. Online learning management systems

4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

- | | |
|---|-----|
| 1. Tests | 20% |
| 2. Take home assignments, case studies, individual / group projects | 20% |
| 3. Final written exam: | 60% |

Reading List:

1. Shelly, G.B. & Rosenblatt, H.J. (2012). *Systems Analysis and Design* (9th Edition). Publisher: Course Technology, Cengage Learning, Boston.
2. Hawryskiewicz, I.T. (2001). *Introduction to Systems Analysis and Design* (5th Edition). Publisher: Prentice Hall.
3. Wang S. & Wang, H. (2012). *Information Systems Analysis and Design*. Publisher: Universal-Publishers
4. Kendall, K.E. & Kendall, J.E. (1999). *Systems Analysis and Design*

Proposed Course Facilitator(s)

1. Dr. Josephine Nabukenya
2. Dr. Peter Khisa Wakholi
3. Ms. Irene Arinaitwe
4. Ms. Lillian Komugisha

Object Oriented Programming

Course Name:	Object Oriented Programming
Course Code:	CSC 1214
Course Level:	Year 1 Sem 2
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIS 1206 Systems Analysis and Design

Course Description:

This course is to give an in-depth understanding of Object Oriented Programming. It is to cater for Object Oriented Programming practices like inheritance, interfaces, exception handling, action handling, security, software reuse and robustness.

Course Objectives:

The aim of the course is to:

1. Improve the skills of the students from a basic level of programming to an advanced level

2. Equip students with skills needed to handle non-functional program aspects like robustness and security
3. Train students to develop complete computer applications

Course Learning Outcomes:

Students who successfully complete this course of study will be able to:

1. Explain the principles of the object oriented programming paradigm specifically including abstraction, encapsulation, inheritance and polymorphism
2. Use an object oriented programming language, and associated class libraries, to develop object oriented programs
3. Design, develop, test, and debug programs using object oriented principles in conjunction with an integrated development environment.
4. Construct appropriate diagrams and textual descriptions to communicate the static structure and dynamic applied of an object oriented solution.

Indicative Content:

1. The Object-oriented paradigm	8 Hours
2. Classes and objects	8 Hours
3. Inheritance and visibility modifiers	8 Hours
4. Interfaces and abstract classes	4 Hours
5. Graphical user interface and action handlers	8 Hours
6. Exception handling	8 Hours
7. Working with files	4 Hours
8. Working with databases	8 Hours
9. Sessions and user management	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Practical sessions
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

- | | |
|------------------------------|-----|
| 1. Tests | 20% |
| 2. Practical assignment | 20% |
| 3. Final written examination | 60% |

Reading List:

1. Lewis, J. and Loftus, W. (2011). *Java Software Solutions* (7th Ed) Prentice Hall.
2. Mughal, K.A. and Rasmussen, R. (2003). *A Programr's Guide to Java Certification*, (2nd Ed). Addison-Wesley Professional.
3. Coad, P. and Nicola, J (1993). *Object-Oriented Programming*. (1st Ed) Prentice Hall.

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Mr. Emmanuel Mugejjera

Semester 3**Data and Information Management II**

Course Name:	Data and Information Management II
Course Code:	IST 2101
Course Level:	Year 2 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIS 1204 Data and Information Management I

Course Description:

This course provides the students with the basic database administration tasks. In addition it will provide key concepts of database confidentiality, data quality, database transaction management and database performance.

Course Objectives:

The aims of this are to provide the students with;

1. Knowledge and hands on experience in database administration tasks
2. Knowledge on data and user security mechanisms implemented by a database management system; data quality management; database transaction management; and database performance mechanisms.

Course Learning Outcomes:

By the end of this course, students should be able to;

1. Perform simple database administration tasks.
2. Demonstrate an understanding of the key principles of database security and identify data security risk and violations in data management system design.
3. Demonstrate an understanding of the core concepts of data quality and their application in an organizational context.
4. Demonstrate an understanding of database transaction management concept and apply it appropriately to an application context.

- Demonstrate an understanding of various mechanisms and techniques for improving on the performance of a database.

Indicative Content:

This course will cover basic database administration tasks and key concepts of data quality and data security. In addition to developing database applications, the course helps the students understand how large-scale packaged systems are highly dependent on the use of DBMSs. The course will also include coverage of topics such as;

1. Functions of a DBMS	4 Hours
2. Data and database administration	6 Hours
3. Database security management a) Basic data security principles b) Data security implementation (database authentication, database authorization, database encryption)	12 Hours
4. Data quality management a) Data quality principles b) Data quality audits c) Data quality improvement	12 Hours
5. Database transaction management concepts	14 Hours
6. Database performance mechanisms like (but not limited to): a) Indexing b) Partitioning c) Multiprocessing d) Disk management	12 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

This course will be delivered through lectures, tutorials and laboratory Practicals. Students will be offered a range of experiences that include:

- Lectures
- Online learning management systems
- Class discussions and presentations
- Group project-based assignments

Mode of Assessment:

- | | |
|--------------------------|-----|
| 1. Tests | 20% |
| 2. Practical assignments | 20% |
| 3. Final written exam | 60% |

Reading List:

1. Silberschatz A., Korth H.F. & Sudarshan. (2010). *Database Systems Concepts* (6th ed.). Publisher: McGraw-Hill.
2. Gordon K. (2007). *Principles of Data Management: Facilitating Information Sharing*.
3. Connolly T. & Begg C. (2005). *Database Systems: A Practical Approach to Design, Implementation, and Management* (4th ed.). Pearson Addison Wesley.
4. Connolly T. & Begg C. (2003). *Database Solutions: A Step by Step Guide to Building Databases* (2nd ed). Pearson Addison Wesley.
5. Greg R. (2001). *Principles of Database Systems with Internet and Java Application*. Addison Wesley.

Proposed Course Facilitator(s)

1. Dr. Mercy Amiyo
2. Mr. Richard Mayanja
3. Mr. Jacob Katende

Web Systems and Technologies I

Course Name:	Web Systems and Technologies I
Course Code:	IST 2102
Course Level:	Year 2 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIS 1204 Data and Information Management I, BIS 1206 Systems Analysis and Design

Course Description:

This course provides a good understanding of the TCP/IP technologies that support communication in the Internet. Such technologies include DNS, FTP, email services, LDAP and the HTTP protocol. It also introduces students to web application development fundamentals, Web application standards and standard bodies; web development approaches and architectures; HTML editors; website authoring tools such as FrontPage and/or Dream weaver. The course also emphasizes hands on experience using mark-up languages such as HTML and client side scripts languages such as CSS and JavaScript.

Course Objectives:

1. To introduce students to the basics of the Internet, how it originated and how it works.
2. To provide students with an overview of the web applications standards and standards bodies
3. To introduce students to Internet related technologies such as DNS, FTP, email services, LDAP and the HTTP protocol.

- To equip students with the basic web applications development and maintenance skills mainly focusing on the client side scripting technologies.

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

- Demonstrate understanding of what the Internet is, how it originated and how it works.
- Identify and explain a selection of web applications standards and standards bodies
- Identify, distinguish and explain the operation of the TCP/IP Internet technologies.
- Demonstrate understanding of a selection of web development approaches and architectures.
- Develop a basic, static website.

Indicative Content:

1. Introduction to the Internet, how it originated and how it works	3 Hours
2. Basic Internet technologies such as DNS, FTP, email services, LDAP and the HTTP protocol	18 Hours
3. Web application standards and standard bodies	3 Hours
4. HTML editors, website authoring tools such as FrontPage and/or Dream weaver	3 Hours
5. Web development approaches and architectures	6 Hours
6. Web mark-up languages such as HTML, XML, XHTML	18 Hours
7. Client side scripting languages such as CSS and JavaScript	9 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources

Mode of Delivery

- Lectures
- Practical lab sessions
- Online learning management systems
- Class discussions and presentations
- Group project-based assignments

Mode of Assessment:

The students shall be evaluated through the

- | | |
|--------------------------|-----|
| 1. Tests | 20% |
| 2. Practical Assignments | 20% |
| 3. Final examination | 60% |

Reading List

1. Shenoy, A. (2014). Thinking in CSS, Publisher: Packt Publishing (April 14, 2014)
2. Fischer, W. (2016). CSS: Quick Start Guide – Effective Web Design (CSS, HTML, JavaScript, Programming), Publication Date: March 24, 2016
3. Forouzan, B. A. (2010). *TCP/IP Protocol Suite*. (4th ed.): McGraw-Hill.
4. Tittel, E. & Noble, J. (2011). HTML, XHTML and CSS for Dummies, Publisher: For Dummies; 7 edition (January 11, 2011)
5. Castro, E. (2006). HTML, XHTML, and CSS, Sixth Edition, Publisher: Peach pit Press; 6 edition (August 26, 2006)
6. Duckett, J. (2009). Beginning HTML, XHTML, CSS, and JavaScript, Publisher: Wrox; 1 edition (December 30, 2009)
7. Felke-Morris, T. (2010). Web Development and Design Foundations with XHTML, 5th Edition; Publisher: Pearson; 5 edition (March 6, 2010)
8. Meyer, A. E. (2006). CSS: The Definitive Guide, Publisher: O'Reilly Media; 3 edition (November 17, 2006)

Proposed Course Facilitator(s)

1. Dr. Florence Nameere Kivunike
2. Ms. Irene Arinaitwe

Entrepreneurship Principles

Course Name:	Entrepreneurship Principles
Course Code:	BAM 2102
Course Level:	Year 2 Sem 1
Contact Hours:	45
Credit Units:	3 CUs
Pre-requisite Courses:	None

Course Description:

This course teaches how to recognize a business opportunity and develop the opportunity into a business. The controlling functions—accounting, finance, marketing, management—as well as legal and economic considerations are applied. In this course Student responsibility and initiative are encouraged as business strategies are created, planned, and presented as a final product—a business plan for an actual business venture. Through the process of developing the business plan, students acquire skills necessary to operate a successful business.

Course Objectives:

The aims of this course are to help students to:

1. Understand entrepreneurial behavior with reference to business
2. Acquire skills involved in creating, planning, developing and managing the entrepreneurial business.

3. Recognize the importance of entrepreneurship and identify the profile of entrepreneurs and their role in economic growth
4. Identify an attractive market that can be reached economically

Course Learning Outcomes:

After successfully completing this course, students should be able to:

1. Describe entrepreneurial behavior with reference to business
2. Demonstrate knowledge involved in creating, planning, developing and managing the entrepreneurial business
3. Articulate the importance of entrepreneurship and identify the profile of entrepreneurs and their role in economic growth
4. Exhibit the ability to find an attractive market that can be reached economically

Indicative Content:

1. Introduction to Business	6 Hours
2. Introduction to Entrepreneurship	6 Hours
3. Business and the entrepreneurial environment	3 Hours
4. Creating the entrepreneurial business	6 Hours
5. Business planning	6 Hours
6. Successful business strategies	6 Hours
7. Forming and protecting a business Managing the Entrepreneurial business	3 Hours
8. Management of Resources in the entrepreneurial business	3 Hours
9. Marketing in an entrepreneurial business	3 Hours
10. Managing Money in an entrepreneurial business	3 Hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Take-home assignments
3. Online learning management systems
4. Class discussions and presentations
5. Problem-based/case studies

Mode of Assessment:

- | | |
|-----------------------|-----|
| 1. Tests | 20% |
| 2. Assignments | 20% |
| 3. Final written exam | 60% |

Reading List:

1. Stokes, D.R. & Wilson, N. (2010). *Small Business Management and Entrepreneurship*, 6th Edition. Publisher: Carnegie Learning EMEA.
2. Storey, D.J. & Greene, F.J. (2010). *Small Business and Entrepreneurship*. Illustrated Edition. Publisher: Financial Times Prentice Hall.
3. Kumar, A.S. (2008). *Small Business and Entrepreneurship*. Publisher: I.K. International Publishing House Pvt. Ltd.
4. Beaver, G. (2002). *Small Business, Entrepreneurship & Enterprise Development*. Publisher: Financial Times Prent. Int.

Proposed Course Facilitator(s)

1. Dr. Paul Mukasa Ssemaluulu
2. Ms. Hasifah Namatovu

Information Systems Security and Risk Management

Course Name:	Information Systems Security and Risk Management
Course Code:	IST 2103
Course Level:	Year 2 Sem 1
Contact Hours:	45
Credit Units:	3 CUs
Pre-requisite Courses:	None

Course Description:

This course provides an introduction to the fundamental principles and topics of Information Systems Security and Risk Management at the organizational level. Students will learn critical security principles that enable them to plan, develop, and perform security tasks. The course will address hardware, software, processes, communications, applications, and policies and procedures with respect to organizational information systems security and risk management.

Course Objectives

1. Enable students understand the fundamental principles of information systems security
2. Enable students understand the concepts of threat, evaluation of assets, information assets, physical, operational, and information security and how they are related
3. Enable students understand the need for the careful design of a secure organizational information infrastructure
4. Equip students with skills for performing risk analysis and management
5. Enable students understand both technical and administrative mitigation approaches

Course Learning Outcomes:

After successfully completing this course, students should be able to:

1. Describe the fundamental principles of information systems security
2. Describe the concepts of threat, evaluation of assets, information assets, physical, operational, and information security, and how they are related
3. Explain the need for the careful design of a secure organizational information infrastructure
4. Perform risk analysis and management
5. Describe both technical and administrative mitigation approaches

Indicative Content:

1. Introduction to information security	6 Hours
2. Inspection	3 Hours
3. Protection	3 Hours
4. Detection	3 Hours
5. Reaction	3 Hours
6. Reflection	3 Hours
7. Risk assessment framework	6 Hours
8. Security engineering	6 Hours
9. Physical aspects	3 Hours
10. Security in connected systems and networks	6 Hours
11. Policy and management issues	3 Hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

- | | |
|-----------------------------------|-----|
| 1. Course work (Tests, Exercises) | 20% |
| 2. Take home assignment | 20% |
| 3. Final written exam: | 60% |

Reading List:

1. Wheeler, E. (2012). *Security Risk Management: Building an Information Security Risk Management Program from the Ground Up*.
2. Kim, D. & Solomon, M.G. (2010). *Fundamentals of Information Systems Security*. Publisher Johns & Bartlett Learning.
3. Kim, D. (2010). *Fundamentals of Information Systems Security* (Information Systems Security & Assurance Series).

4. Slay, J & Koronios, A. (2006). *Information technology security & risk management*.
5. Gibson, D. (2010). *Managing Risk in Information Systems* (Information Systems Security & Assurance Series).

Proposed Course Facilitator(s)

1. Dr. Raymond Mugwanya
2. Mr. Jacob Katende
3. Dr. Fiona Tulinayo

Electronic Media Systems and Multimedia

Course Name:	Electronic Media Systems and Multimedia
Course Code:	IST 2104
Course Level:	Year 2 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	None

Course Description:

This course unit is designed to provide students with technical skills and a strong foundation in graphics design, animation, video production and management, studio management, sound effect management among others. It gives students opportunity to interact with many different areas of multimedia. It gives a detailed review of multimedia concepts and how they are integrated into final multimedia production.

Course Objectives:

The course aims to:

1. Introduce students to industry standard software authoring and hardware tools used in creating multimedia projects
2. Investigate the video preparation, production, editing process.
3. Introduce students to multimedia theories and practices employed in the multimedia industry.
4. Discuss concepts of digital photography and digital camera management
5. Facilitate students building multimedia projects that include sound, animation, text, video, interactivity, 2D and 3D Art.

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Employ industry standard software authoring and hardware tools used in creating multimedia projects

2. Present an understanding of video preparation, production, editing process (Digitize and prepare raw footage for editing).
3. Demonstrate understanding of multimedia theories and practices employed in the multimedia industry.
4. Demonstrate understanding of digital photography and digital camera management.
5. Develop a variety of multimedia projects that include sound, animation, text, video, interactivity, 2D and 3D Art.

Indicative Content:

1. Introduction to multimedia theories	3 Hours
2. Multimedia authoring and Programming (open source and closed source): Multimedia Development Tools, classification of presentation tools available for multimedia development, Features of Authoring Software, weakness and strength of authoring versus Programming.	9 Hours
3. Comprehensive discussion of Multimedia story telling	6 Hours
4. Detailed discussion of digital photography: Definition and History, Types of Photography	6 Hours
5. Sound Management in Multimedia	6 Hours
6. Digital Audio in Multimedia MIDI	6 Hours
7. Detailed discussion of the animation process:	6 Hours
8. Comprehensive discussion of video and text: Explain standards for Broadcasting	6 Hours
9. Detailed discussion of music and speech:	6 Hours
10. Comprehensive review of digital studio planning, layout and setup and Management: Photo studios, Television studios, hardware and software requirements and human ware required.	6 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Practicals
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

Assessment will be in terms of

- | | |
|--|-----|
| 1. Coursework (tests, practical exercises, individual project) | 40% |
|--|-----|

2. Final examination

60%

Reading List

1. Ditsa, G. (2003). *Information management: support systems & multimedia technology*. IGI Global.
2. Li, Z. N., Drew, M. S., & Liu, J. (2004). *Fundamentals of multimedia* (pp. 253-287). Upper Saddle River (NJ): Pearson Prentice Hall.
3. Salomon, D. (2007). *A concise introduction to data compression*. Springer Science & Business Media.
4. Salomon, D. & Motta, G. (2010). *Handbook of data compression*. Springer Science & Business Media.
5. Steinmetz, R. & Nahrstedt, K. (2004). Multimedia applications. In *Multimedia applications* (pp. 197-214). Springer Berlin Heidelberg.

Proposed Course Facilitator(s)

1. Dr. Florence Nameere Kivunike
2. Mr. Halim Chongomweru

Semester 4

System Administration

Course Name: System Administration
Course Code: IST 2201
Course Level: Year 2 Sem 2
Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: BSE 2106 Computer Networks, CSC 1107 Structured Programming

Course Description:

This course addresses the requirements of setting up computer systems, maintaining them and ensuring that the users of these systems have access to them, in spite of the activities of users who tend to cause the systems to fail.

Course Objectives

The course aims to provide students with knowledge and skills in:

1. Installing, configuring, securing and troubleshooting operating systems and hardware.
2. Networking, including installing, configuring, securing and troubleshooting the devices, protocols and services within a network infrastructure.
3. Helping other technology users, develop training and maintenance plans and to translate their technical knowledge so that others can use it.

- Document their work, write clearly and appropriately in an Information Technology context, respect user's data, including backup and security, and to think through the ethical consequences of Information Technology decisions.

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

- Demonstrate essential IT support skills including installing, configuring, securing and troubleshooting operating systems and hardware.
- Demonstrate essential networking skills including installing, configuring, securing and troubleshooting the devices, protocols and services within a network infrastructure.
- Demonstrate the ability to help other technology users, develop training and maintenance plans and to translate their technical knowledge so that others can use it.
- Demonstrate the ability to document their work, write clearly and appropriately in an Information Technology context, respect user's data, including backup and security, and to think through the ethical consequences of Information Technology decisions.

Indicative Content:

1. Security Management and Policies	4 Hours
2. Automating System Administration	2 Hours
3. System Configuration Management	2 Hours
4. Email	2 Hours
5. Open Technology	2 Hours
6. System Backup: Methodologies, Algorithms and Efficiency Models	4 Hours
7. Management of ad-hoc Networks	2 Hours
8. Introduction to system administration: Discuss an overview of the system administration world; understand key concepts of system administration.	6 Hours
9. Operating system concepts: Understand basic concepts that are the foundation of Operating System design, understand the Exodus of Operating Systems	6 Hours
10. System Booting and Halting	6 Hours
11. System navigation and understanding (windows and Unix): Paths, architecture, directory structure	6 Hours
12. Operating System Installations and Configurations (server and client) as well as Maintenance	8 Hours
13. System Software installation and Management	6 Hours
14. Systems Security: Concepts of Security administration key to a systems administrator	8 Hours
15. Networking terminologies: VLAN, VSAT, hacking tools, protocol analyzers, network monitoring.	2 Hours

TOTAL HOURS	60 HOURS
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Study Materials

Text books and online resources.

Mode of Delivery:

1. Lectures
2. Practical sessions
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

Assessment will be in terms of

- | | |
|--------------------------|------|
| 1. Tests | 20% |
| 2. Practical Assignments | 20 % |
| 3. Final examination | 60% |

Reading List

1. Burgess, M. (2004). Principles of Network and System Administration. . Published by Wiley and Sons 2ND Edition. ISBN 0-470-86807-4
2. Frisch, E. (2002). *Essential System Administration: Tools and Techniques for Linux*
3. Burgess, M. (2007). Principles of Network and *System Administration*.
4. Ainsworth, J.K. & Kriegel, K.A. (2004). *System administration: preparing for Network+ certification*.

Proposed Course Facilitator(s)

1. Dr. Johnson Mwebaze
2. Mr. Jacob Katende
3. Dr. Paul Mukasa Ssemaluulu

E-Services

Course Name:	E-Services
Course Code:	IST 2202
Course Level:	Year 2 Sem 2
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIS 2106 Data and Information Management II, BIS 1206 Systems Analysis and Design, 1102 Emerging Trends in IST

Course Description:

This course addresses the application, utilization and the use of Information and communication technologies (ICTs) in different application domains such as health,

education, government, business. This course introduces students to the concepts and practices of e-services that is, deeds, efforts or performances whose delivery is mediated by information technology

Course Objectives:

The course aims:

1. To introduce students to the basic concepts, terminology and technologies used for e-services
2. To provide students with knowledge and skills in applying e-services to different application domains such as e-health, e-government, e-commerce, e-learning, and e-taxation.
3. To provide students with skills to be able evaluate e-services against current best practice principles and standards.
4. To provide students with the knowledge and skills required to apply basic business case and IT management concepts in preparing e-government/health proposals, plans or strategies.

Course Learning Outcomes:

At the end of the course, students should be able to:

1. Explain the basic concepts, terminology and technologies used for e-services
2. Apply the knowledge and skills acquired in e-services to provide solutions in the different application domains of e-health, e-government, e-commerce, e-learning, and e-taxation.
3. Use the skills acquired to evaluate e-services against current best practice principles and standards.
4. Apply the knowledge and skills acquired to a basic business case in preparing e-government and e-health proposals, plans or strategies.

Indicative Content

1. Introduction to e-services	4 Hours
2. Challenges and opportunities for ICTs in developing countries	8 Hours
3. Information Technology for e-Government Applications a) Techniques and Tools for Transactions and Data Exchange b) GIS Applications	8 Hours
4. E-Governance systems a) Growth and ICTs b) Education and ICTs c) Health and ICTs	8 Hours
5. E-Health Systems a) Mobile Applications for Health Professionals b) Mobile data collection systems	8 Hours
6. Privacy and Security Issues a) Information security management	8 Hours
7. IT Management for Governments and Non-profits a) Organizational structures in e-government	8 Hours

b) Trends in outsourcing c) Use of open source applications in government	
8. Case Study on a model ICT for development projects	8 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment

- | | |
|-------------------------|-----|
| 1. Tests | 20% |
| 2. Take home assignment | 20% |
| 3. Final written exam | 60% |

Reading List

1. David, G.G. (2006). *Public Information Technology and E-Governance: Managing the Virtual State*. Boston: Jones & Bartlett.
2. Tan, J. (2005). *E-Health Care Information Systems: An Introduction for Students and Professionals*.
3. Whitten, P., & Cook, D. (Eds.) (2004). *Understanding Health Communication Technologies* (Jossey-Bass Public Health).
4. Garson, G.D. (2006). *Public Information Technology and E-Governance: Managing the Virtual State*.

Proposed Course Facilitator(s)

1. Dr. Emily Bagarukayo
2. Dr. Florence Nameere Kivunike

Research Methodology

Course Name: Research Methodology
Course Code: IST 2203
Course Level: Year 2 Sem 2
Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: BIS 1206 Systems Analysis and Design, COE 2102 Business Statistics

Course Description:

Research is essential in nearly all aspects of life. This course unit enables students to learn and apply principles of conducting scientific research. It caters for the rationale of doing research, the research process, findings presentation as well as validation of findings. The course also prepares the students on the process of conducting the final year project.

Course Objectives:

To objectives of the course are to equip students with skills to

1. Formulate a research problem
2. Document and justify the research aims
3. Select appropriate methods of solving a research problem
4. Correctly correct and analyze data
5. Document and present findings

Course Learning Outcomes:

A Student who has undertaken this course unit will be able to learn skills that will enable him/her to successfully undertake a research project. He/she will be able to:

1. Identify a relevant or significant research problem.
2. Identify the aims of a research project that can solve a given problem.
3. Select appropriate research methods to be used in solving a given project.
4. Select appropriate data collection techniques that can be used to gather data required to solve a given project.
5. Select appropriate data analysis techniques and use them to process collected data, interpret data analysis results.

Indicative Content

1. Introductory concepts of research: what is research, understanding the research process and fundamental concepts of research, how to formulate a research problem, research objectives, research questions, how to define scope, how to conduct literature review in a given study etc.	12 Hours
2. Research methods: Student learns the various quantitative and qualitative research methods. Student also learns the data gathering techniques.	12 Hours
3. Research evaluation: The evaluation phase of a research project, testing and validation of developed tool or research results. E.g. How to evaluate, testing, and validate research results; what are the evaluation criteria? What are the validation methods? What is one testing in the testing phase?	12 Hours
4. Research application: covers the practical application of concepts learned from parts I to III. The lecturer suggests one or	12 Hours

several class projects that require practical application of concepts learned from parts I to III.	
5. Report writing: how to prepare a research report, how to report research results/findings, how to present feedback or findings from evaluating the developed tool or research results etc.	12 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment

The course will be assessed by

- | | |
|---|-----|
| 1. Course work (individual assignments and tests) | 40% |
| 2. Final examination | 60% |

Reading List

1. Zikmund, W.G. (2010). Business Research Methods (8th Ed.) Thomson South Western
2. Leedy, P.D., & Ormrod, J.E. (2004). Practical Research: Planning and Design Paperback, Prentice Hall
3. Sounders, M., Lewis, P. & Thornhill, A. (2003). Research Methods for Students. 3rd edition, UK, Financial times, Prentice hall
4. Graziano, A.M, Michael, L. (2006). Research Methods: A process of Inquiry Raulin, Hardcover, Prentice Hall

Proposed Course Facilitator(s)

1. Dr. Amina Zawedde
2. Dr. Fiona Tulinayo
3. Dr. Agnes Nakakawa

IST Project Management

Course Name:	IST Project Management
Course Code:	IST 2204
Course Credit:	4 CUs
Contact Hours:	60
Year of study:	2

Semester: 2
Pre-requisite Courses: BIS 1206 Systems Analysis and Design, CSK 1101
Communication Skills

Course Description:

This course presents to students the fundamentals and best practices of project management methods as applied to Information Technology projects and Initiatives. Learners are introduced to practices and master the skills one requires to deliver Information Technology projects on time, within budget, and to specification. The course examines all aspects of Information Technology projects, including hardware, software, vendor relationships, communicating with different audiences, and working with local and remote teams. Learners develop skills to determine project scope, set and manage stakeholder expectations, identify and manage IT risks, and meet quality standards.

Course Objectives:

The course aims to:

1. Introduce students to the basic concepts of a project, program, and portfolio management.
2. Provide learners with Knowledge about the various approaches for selecting projects.
3. Introduce to learners the different tools and techniques as applied to IST project management
4. Introduce to students the uses of Practical contemporary project management tools like Microsoft Project 2007 or 2010 and other software to help plan and manage a project
5. Provide learners with an appreciation of the importance of good project management by sharing examples of good and bad project management and using knowledge and skills developed in this class in other settings.

Course Learning Outcomes:

Upon completion of this course, students should be able to:

1. Show Understanding of the genesis of project, program, and portfolio management and their importance to enterprise success and be able to describe the various approaches for selecting projects.
2. Explain the main tasks involved in inputs and outputs of initiating, planning, executing, monitoring and controlling and closing projects
3. Demonstrates knowledge of project management knowledge areas, tools and techniques used
4. Applies project management concepts by working on a team project as project manager or active team member.
5. Appreciates the importance of good project management by sharing examples of good and bad project management and using knowledge and skills developed in this class in other settings.

Indicative Content:

The course will cover the following areas;

1. Introduction to Project Management and Overview of Process Groups 6 Hours
2. Overview of Project Management Knowledge Areas 6 Hours
3. Initiating Process Group, Planning Process Group and Executing Process Group 6 Hours
4. Monitoring & Control Process Group and Closing Process Group 3 Hours
5. Project Integration Management & Project Scope Management 3 Hours
6. Project Time Management and Project Cost Management 6 Hours
7. Practical sessions 6 Hours
8. Project Quality Management & Project Human Resource Management 6 Hours
9. Project Communications Management and Project Risk Management 6 Hours
10. Project Procurement Management 3 Hours
11. Tools and techniques of project management and Projects within the organization 3 Hours
12. Practical sessions 6 Hours

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

Assessment will be in terms of

1. Coursework (group work, tests and practical exercises) 40%
2. Final examination 60%

Reading List

1. Schwalbe, K. (2010). *Information Technology Project Management 6th (sixth) edition Sixth Edition*
2. Dobi, C. (2007). *A handbook of Project Management: A Complete Guide for beginners to professionals*, New SouthWales: Allen and Unwin.
3. PMI. (2009). *A Guide to the Project Management Body of Knowledge (PMBOK) 4th Edition*, Project Management Institute, Upper Darby, PA.
4. Cuthworth, J.W. & Franks, T. (1993). *Managing Projects in Developing Countries*, Prentice hall, London.

Proposed Course Facilitator(s)

1. Associate Professor Gilbert Maiga
2. Ms. Margaret Nagwovuma

Web Systems and Technologies II

Course Name:	Web Systems and Technologies II
Course Code:	IST 2205
Course Level:	Year 2 Sem 2
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIT 2111 Web Systems and Technologies I

Course Description:

This course equips students with skills for developing dynamic, database driven web applications using various development frameworks such as WAMP and WISA. The course ensures that students acquire in-depth understanding of the processes involved in the development of a web application. The course also emphasizes hands on practical experience on developing data models and developing code using server side technologies such as PHP and ASP to interact with these models.

Course Objectives:

The aims of the course are;

1. To introduce students to server side scripting technologies and development frameworks
2. To equip students with the skills to analyze requirements for their web based applications
3. To equip students with the skills to design and develop data models that would be used in their web applications using SQL server databases
4. To equip students with the skills to write server side code that would be used to interact with the SQL Server databases and provide output to the client side
5. To provide students with the skill to develop secure and scalable web applications

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Demonstrate understanding of server side technologies and development frameworks
2. Analyze requirements for their web based applications
3. Design and develop data models that would be used in their web applications using SQL server databases

4. Demonstrate understanding of how server side technologies interact with SQL server databases
5. Develop a prototype of a secure and scalable web application

Indicative Content:

1. Recap of Client-side programming such as XHTML forms and JavaScript input validation	8 Hours
2. The development process of a web application	8 Hours
3. Data driven web application frameworks	8 Hours
4. Developing data models for the web applications using SQL	8 Hours
5. Server-side technologies such as PHP, ASP	8 Hours
6. Interaction of server side technologies with SQL Database	8 Hours
7. Creating secure web applications	8 Hours
8. Web services and servers	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Practical lab sessions.
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

The students shall be evaluated through the

- | | |
|-------------------------|-----|
| 1. Test | 20% |
| 2. Practical Assignment | 20% |
| 3. Final examination | 60% |

Reading List

1. Fischer, W. (2016). CSS: Quick Start Guide – Effective Web Design (CSS, HTML, JavaScript, Programming), Publication Date: March 24, 2016
2. Welling, L. & Thomson, L. (2016). PHP and MySQL Web Development, Publisher: Addison-Wesley Professional; 5 edition (September 30, 2016)
3. DuBois, P. (2014). MySQL Cookbook: Solutions for Database Developers and Administrators, Publisher: O’Reilly Media; 3 edition (August 18, 2014)
4. Duckett, J. (2014). JavaScript and JQuery: Interactive Front-End Web Development; Publisher: Wiley; 1 edition (June 30, 2014)
5. Felke-Morris, T. (2010). Web Development and Design Foundations with XHTML, 5th Edition; Publisher: Pearson; 5 edition (March 6, 2010)

6. Holdener III, T. A. (2008). Ajax: The Definitive Guide, Publisher: O'Reilly Media; 1 edition (February 4, 2008)
7. Castro, E. (2006). HTML, XHTML, and CSS, Sixth Edition, Publisher: Peach pit Press; 6 edition (August 26, 2006)

Proposed Course Facilitator(s)

1. Dr. Florence Nameere Kivunike
2. Mr. Emmanuel Mugejjera
3. Ms. Hawa Nyende

Semester 5 – Information Technology Security Option

Project I

Course Name:	Project I
Course Code:	IST 3101
Course Level:	Year 3 Sem 1
Contact Hours:	75
Credit Units:	5 CUs
Pre-requisite Courses:	CSK 1101 Communication Skills, BIT 2207 Research Methodology

Course Description:

Project I is part of the BIST students' final year projects. It provides students with the skills to identify a system administration and/or security problem, define objectives and write a research proposal that would be turned into a working system during their second semester. It enables students to apply skills they have learned from other courses during their time of study especially research methodology and system development related courses.

Course Objectives

1. To give the students experience in writing information technology research proposals that would provide IT solutions to real world problems affecting the industry at large.
2. Enable students to Review relevant literature that would inform the process of solving a given problem
3. Expose students to appropriate research methods to be used in solving a given problem
4. Introduce appropriate data collection techniques that can be used to gather data required to solve a given problem.
5. Train students in budgeting in order to realize the project
6. Educate students how to write an IT project research proposal that would be turned into a working system in the second semester of their study.

Course Learning Outcomes:

By the end of the course, the student should be able to:

1. Demonstrate expertise in writing information technology research proposals that would provide IT solutions to real world problems affecting the industry at large
2. Review relevant literature that would inform the process of solving a given problem
3. Identify an appropriate research method to be used in solving a given problem.
4. Use appropriate data collection techniques to gather data required to solve a given problem.
5. Develop a budget that would be used to realize the project
6. Write an IT project research proposal that would be turned into a working system in the second semester of their study.

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Field work
3. Online learning management systems
4. Class discussions and presentations
5. Industry based case studies

Mode of Assessment

- | | |
|---|-----|
| 1. Bi-weekly progress assessment by supervisor | 40% |
| 2. Final research proposal presentation to supervisor | 60% |

Reading List

1. Zikmund, W.G. (2010). Business Research Methods (8th Ed.) Thomson South Western
2. Leedy, P.D., & Ormrod, J.E. (2004). Practical Research: Planning and Design Paperback, Prentice Hall
3. Sounders, M., Lewis, P. & Thornhill, A. (2003). Research Methods for Students. 3rd edition, UK, Financial times, Prentice hall
4. Graziano, A.M, Michael, L. (2006). Research Methods: A process of Inquiry Raulin, Hardcover, Prentice Hall

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Ms. Flavia Namagembe
3. Dr. Daudi Jjingo

Network Security

Course Name:	Network Security
Course Code:	IST 3102
Course Level:	Year 3 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIT 2208 System Administration, BSE 2106 Computer Networks

Course Description

This course provides an overview of the key security issues and procedures in computer and mobile communication networks. Among the issues presented are: the security of LANs, WANs, databases, and network operating systems; threats to computer networks through exploitation of network infrastructure design weaknesses; security flaws in the network infrastructure protocols; security of content in computer network services; risk assessment and security policies; and security in mobile communication networks. Procedures include: networks intrusion detection and forensics technologies, cryptographic and authentication systems, capability and access control mechanisms, and new developments in Internet routing and transport protocols, secure mail, directory, and multimedia multicast services. Current trends and research in security policies and technologies is also discussed.

Course Objectives

This course aims:

1. To introduce to students current and effective procedures to deal with network security threats, including use of best practices software tools.
2. To make students aware of the security perils and vulnerabilities in computing in general and in both fixed computer and mobile networks in particular
3. To create understanding of the issues pertaining to protecting computer systems against unauthorized penetration and access and denial of service to computing systems
4. To provide students with both the theoretical and practical understanding of network security principles, tools and configurations available with an emphasis on practical application these to search for network security solutions.
5. To affect students' behavior by challenging them to examine the role ethical and moral deliberations at play in the security of their highly networked environments.

Course Learning Outcomes

At the end of the course, the students should be able:

1. To explain the current procedures used to deal with network security threats and the use of best practices software tools.

2. To explain the security perils and vulnerabilities in computing in general and in both fixed computer and mobile networks in particular
3. To demonstrate knowledge and understanding of the issues pertaining to protection of computer systems against unauthorized penetration and access, and denial of service to computer systems
4. To demonstrate theoretical knowledge of network security principles, tools and configurations available and practical skills on the search for network security solutions.
5. To show understanding of the role ethical and moral deliberations at play in the security of highly networked environments.

Indicative Content

Part I: Security Awareness	
1. Computer Network Security (Security Threats and attacks)	4 Hours
2. Vulnerability of Computer Networks	4 Hours
3. Cyber Crimes and Hackers & Hostile Scripts	4 Hours
4. Security Assessment, Analysis and Assurance	4 Hours
5. Securing Local area network and Network Devices	4 Hours
6. Implementing Virtual Private Networks	4 Hours
7. Managing a secure network	4 Hours
Part II: Network Security Challenges	
8. Access Control, Authorization and Authentication	4 Hours
9. Cryptography (Private and public-key encryption, hash Functions, encryption algorithms, confidentiality, key distribution, message authentication, digital signatures)	4 Hours
10. Implementing Firewall Technologies, Firewalls & Network Security Practice	4 Hours
11. Intrusion Detection and Prevention	4 Hours
12. Network Security Practice(IP Sec, S/Mime, PGP)	4 Hours
13. Security Evaluations of Computer Products	4 Hours
Part III: Security in Modern Mobile Communications	
14. Mobile network infrastructure and protocols (Security protocols and operations)	4 Hours
15. Site security summary	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures

2. Laboratory practicals
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment

The assessment will be in form of

- | | |
|--------------------------|-----|
| 1. Tests | 20% |
| 2. Practical Assignments | 20% |
| 3. Final written exam | 60% |

Reading List

1. Stallings, W. (2016). *Cryptographic and Network Security: Principles and Practice*. (7th ed). Pearson, England.
2. Whitman, M. E. & Mattord, H. J. (2012). *Principles of Information Security*, 4th Edition, Course Technology, Cengage Learning, Canada, ISBN-13: 978-1-111-13821-9
3. Maiwald, E. (2001). *Network Security: A Beginner's Guide*. McGraw-Hill, Chicago.
4. Krutz, R. L. & Vines, R. D. (2001). *The CISSP Prep Guide—Mastering the Ten Domains of Computer Security*. John Wiley & Sons, Inc.
5. Kurose, J.F. & Ross, K.W. (2000). *Computer Networking: A Top-Down Approach Featuring the Internet*, Addison Wesley. ISBN 0-471-11709-9.

Proposed Course Facilitator(s)

1. Dr. Johnson Mwebaze
2. Dr. Drake Mirembe
3. Dr. Richard Ssekibuule

Enterprise Network Management

Course Name:	Enterprise Network Management
Course Code:	IST 3103
Course Level:	Year 3 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BSE 2106 Computer Networks, BIT 2208 System Administration

Course Description:

Most companies now have their own computer network systems that are vital to their operation. These companies require staff that can install and manage these networks. This course provides students with the specialist knowledge and skills needed to confidently undertake these roles. The course covers the basics of network

management, alternative architectures, SNMP and CMIP management protocols and the FCAPS network management functions: fault management, performance management, configuration management, security management, and accounting management.

Course Objectives:

1. To equip students with general concepts and architecture behind standards based network management
2. To equip students with the necessary skills of installing and managing large-scale enterprise network management systems
3. To introduce students to some TCP/IP network management protocols e.g. Simple Network Management (SNMP) and CMIP

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Demonstrate an understanding of the general concepts and architecture behind standards based network management
2. Demonstrate the application of a few open source network management tools to manage enterprise network systems
3. Demonstrate an understanding of some TCP/IP network management protocols e.g. Simple Network Management (SNMP) and CMIP

Indicative Content:

1. Network Management Overview - understand what network management is and why it is relevant, Network management Architecture	6 Hours
2. Functionality of the SNMP and CNMP protocols and their use it	12 Hours
3. The FCAPS management functional areas including a) Fault Management - Maintain error logs, handle fault notifications, trace faults, diagnostic tests, correct faults, b) Configuration Management - Record configuration, record changes, identify components, init/stop system, change parameters c) Accounting Management - Establish charges, identify utilization costs, billing d) Performance Management - Optimize QoS (Quality of Service), detect changes in performances, collect statistics e) Security Management - key management (authorization, encryption & authentication), firewalls, security logs	30 Hours
4. Network management tools – e.g. open source tools on network monitoring, documentation, log managers, end-user support tools	6 Hours
5. Service level management: service level agreements, service level monitoring and performance measurement, service level assurance	6 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Practical sessions
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

The students shall be evaluated through the

1. Coursework 40%
2. Final examination 60%

Reading List

1. Peterson, L. & Davie, B. (2012). *Computer Networks: A Systems Approach*, 5th Edition, Morgan Kaufmann Publishers Inc., San Francisco, CA
2. Clemm, A. (2007). *Network Management Fundamentals*, Cisco Press 2007, ISBN 1-58720-137-2
3. Stallings, W. (1996). *SNMP, SNMPv2, SNMPv3, and RMON 1 and RMON2*. Addison-Wesley (3rd edition), ISBN 0-201-48534-6

Proposed Course Facilitator(s)

1. Dr. Drake Mirembe
2. Dr. Richard Ssekibuule

Intrusion Detection and Incident Management

Course Name: Intrusion Detection and Incident Management
Course Code: IST 3104
Course Level: Year 3 Sem 1
Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: BIT 2208 System Administration, BSE 2106 Computer Networks

Course Description

The course presents the process of monitoring the events occurring in a computer system or network and analyzing them for signs of possible incidents, which are violations or imminent threats of violation of computer security policies, acceptable use policies, or standard security practices. Intrusion prevention is the process of performing

intrusion detection and attempting to stop detected possible incidents. Intrusion detection and prevention systems (IDPS)¹ are primarily focused on identifying possible incidents, logging information about them, attempting to stop them, and reporting them to security administrators.

Course Objectives

1. General and Network-Based Intrusion detection and Prevention systems, which monitors network traffic for particular network segments or devices and analyzes the network and application protocol activity to identify suspicious activity
2. Wireless, which monitors wireless network traffic and analyzes it to identify suspicious activity involving the wireless networking protocols themselves
3. Network Behavior Analysis (NBA), which examines network traffic to identify threats that generate unusual traffic flows, such as distributed denial of service (DDoS) attacks, certain forms of malware, and policy violations (e.g., a client system providing network services to other systems)
4. Host-Based, which monitors the characteristics of a single host and the events occurring within that host for suspicious activity

Course Learning Outcomes

Upon completion of this material, you should be able to:

1. Identify and describe the categories and operating models of intrusion detection systems
2. Identify and describe honey pots, honey nets, and padded cell systems
3. List and define the major categories of scanning and analysis tools, and describe the specific tools used within each of these categories
4. Discuss various approaches to access control, including use of biometric access mechanisms

Indicative Content

1. Overview of Intrusion Detection Systems	4 Hours
2. Intrusion Detection and Prevention Principles	4 Hours
3. IDPS Technologies	4 Hours
4. Network-Based IDPS	8 Hours
5. Wireless IDPS	6 Hours
6. Network Behavior Analysis (NBA) System	8 Hours
7. Host-Based IDPS	8 Hours
8. Using and Integrating Multiple IDPS Technologies	6 Hours
9. IDPS Product Selection	6 Hours
10. Incidence response planning	6 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Lab practicals
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

The assessment will be in form of

- | | |
|-----------------------------------|-----|
| 1. Coursework (group work, tests) | 40% |
| 2. Final written exam | 60% |

Reading List

1. Fadia, A. (2007). *Intrusion Alert: An Ethical Hacking Guide to Intrusion Detection*. ISBN-10: 1598634143
2. Beale, C.J., & Baker, A. (2007). *Snort Intrusion Detection and Prevention Toolkit*. ISBN-10: 1597490997
3. Rash, M. & Orebaugh, A.D. et al, (2005). *Intrusion Prevention and Active Response: Deploying Network and Host IPS*. ISBN-10: 193226647X
4. Northcutt, S. & Novak, J. (2002) *Network Intrusion Detection (3rd Edition)* ISBN-10: 0735712654
5. Carter, E. & Hogue, J. (2006) *Intrusion Prevention Fundamentals*. ISBN-10: 1587052393

Proposed Course Facilitator(s)

1. Dr. Drake Mirembe
2. Dr. Richard Ssekibuule

Digital Forensics Investigation

Course Name:	Digital Forensics Investigation
Course Code:	IST 3105
Course Level:	Year 3 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIT 2208 System Administration and BSE 2106 Computer Networks

Course Description:

This course provides an overview of digital forensics and incident response by placing students in a series of hands-on assessments based on industrial case studies related

to digital forensics and incident response. Students will work in groups to respond to and investigate corporate and government intrusions. Students will learn event correlation and reconstruction techniques as well as cutting-edge data collection and analysis approaches. Students will be required to apply and synthesize these competencies and utilize their own problem solving skills to bring these cases to court. Students must follow sound digital forensic methodology to protect and prepare digital evidence and expert testimony to support any legal trials.

Additionally, students will learn and implement executive best practices for managing crisis situations effectively including vulnerability assessment, threat vectors, incident response strategies, components of a secure system, security testing, basic forensic skills, forensic acquisition, analysis and reporting of digital evidence using commercial and open source tools, terminology, and methods and systems auditing.

Course Objectives:

The course aims to enable students to develop their knowledge and understanding of:

1. Identifying and employing tools for tracking intruders, gathering, preserving and analyzing evidence of their activities.
2. Emphasizing both the fundamental digital forensics techniques and the hands-on experience of utilizing the tools needed to uncover illegal activities of digital users.
3. The basic procedure of incident response.
4. Learning the procedures used to gather and preserve this evidence to ensure admissibility in court.

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Utilize available forensic tools for tracking intruders, gathering, preserving and analyzing evidence of their activities.
2. Demonstrate their ability to identify and utilize appropriate IDS tools to detect network and system intruders.
3. Describe the basic procedure of incident response.
4. Obtain the basic skills to uncover hidden evidence such as deleted and hidden files, cryptographic, steganography, and illegal software and crack encrypted files.

Indicative Content:

1. Digital forensic methodology, implementing executive best practices for managing crisis situations effectively including vulnerability assessment, threat vectors, and incident response strategies.	9 Hours
2. Components of a secure system	3 Hours
3. Security testing, 4. Forensic skills and acquisition, analysis and reporting of digital evidence using commercial and open source tools,	9 Hours

5. Terminologies, and methods for systems auditing.	
6. Legal Considerations	6 Hours
7. Evidence Collection and Preservation	6 Hours
8. Preparing Incident Response Tools	3 Hours
9. Hackers' Methods of Maintaining Presence/Persistence Methods	6 Hours
10. System Compromise Indicators/Detecting and Confirming Intrusions	6 Hours
11. Malware Analysis	4 Hours
12. Building an Incident Response Tool Suite	4 Hours
13. System Registry Analysis	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Laboratory practicals
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

The assessment will be in form of

- | | |
|-----------------------------------|-----|
| 1. Coursework (group work, tests) | 40% |
| 2. Final written exam | 60% |

Reading List

1. Taylor, R. W., Fritsch, E. J., & Liederbach, J. (2014). *Digital crime and digital terrorism*. Prentice Hall Press.
2. Casey, E. (2011). *Digital evidence and computer crime: Forensic science, computers, and the internet*. Academic press.
3. Jones, K. J., Bejtlich, R., & Rose, C. W. (2005). *Real digital forensics: computer security and incident response*. Addison-Wesley Professional.
4. Kruse II, W. G., & Heiser, J. G. (2001). *Computer forensics: incident response essentials*. Pearson Education.
5. Lillard, T. V. (2010). *Digital forensics for network, Internet, and cloud computing: a forensic evidence guide for moving targets and data*. Syngress Publishing.
6. Mandia, K. (2001). *Incident response: investigating computer crime*. McGraw-Hill Professional.
7. Prorise, C., Mandia, K., & Pepe, M. (2003). *Incident response & computer forensics* (p. 11). New York: McGraw-Hill/Osborne.

Proposed Course Facilitator(s)

1. Dr. Drake Mirembe
2. Dr. Richard Ssekibuule

Semester 6 – Information Technology Security Option**Project II**

Course Name:	Project II
Course Code:	IST 3201
Course Level:	Year 3 Sem 2
Contact Hours:	75
Credit Units:	5 CUs
Pre-requisite Courses:	IST 3101 Project I

Course Description:

This course builds on project I. Students use the knowledge and concepts acquired from research methodology and other relevant course units to implement their proposed solution to the problem and objectives defined in project I. Each student will pursue a lengthy project in any area of systems administration and/or security. The project will be specified, designed and implemented, with one of the Professors / lecturers as advisor / supervisor.

Course Objectives:

1. To enable students produce a working application (artifact) with guidance from their supervisors.
2. To train students in the art of report writing.

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Apply the skills and knowledge acquired during the course of study, to produce a working application/prototype (artifact).
2. Generate a report as an output of the project.

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Supervisor-student discussions
2. Group discussions
3. Fieldwork and demonstrations
4. Presentations

Mode of Assessment

- | | |
|---|-----|
| 1. Weekly progress assessment by supervisor | 40% |
| 2. Final project presentation to an examination panel | 60% |

Reading List:

1. Zikmund, W.G. (2010). Business Research Methods (8th Ed.) Thomson South Western
2. Leedy, P.D., & Ormrod, J.E. (2004). Practical Research: Planning and Design Paperback, Prentice Hall
3. Sounders, M., Lewis, P. & Thornhill, A. (2003). Research Methods for Students. 3rd edition, UK, Financial times, Prentice hall
4. Graziano, A.M, & Michael, L. (2006). Research Methods: A process of Inquiry Raulin, Hardcover, Prentice Hall

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Ms. Flavia Namagembe
3. Dr. Daudi Jjingo

Ethical Hacking

Course Name:	Ethical Hacking
Course Code:	IST 3202
Course Level:	Year 3 Sem 2
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	IST 3102 Network Security, BIT 2210 Intrusion Detection and Incident Management

Course Description:

Teaching offensive security ethical hacking has become a necessary component of information security. This course is designed to equip students with skills to be professionals in information systems security. The course provides the hacking tools and techniques used by hackers and information security professionals alike to break into an organization. To learn the hacking technologies, you will need to become one, but an ethical one!

This course will immerse you into the Hacker Mindset in order to be able to defend against future attacks. The security mindset in any organization must not be limited to the silos of a certain vendor, technologies or pieces of equipment. And therefore this course will not restrict students' mindset; they will scan, test, hack and secure their own systems.

Course Objectives:

1. Introduce students to the technologies of ethical hacking, how they are applied.
2. Make students understand how various types of hacker used tools and techniques.
3. Make students understand the phases of ethical hacking.
4. Make students understand and describe the new trends ethical hacking.
5. Make students understand the defensive and offensive types of hacking.
6. Give students an understanding of social engineering and malicious activities on data.

Course Learning Outcomes:

At the end of this course, students should be able to:

1. Understand the technologies of ethical hacking, how they are applied
2. Describe how various types of hacker used tools and techniques.
3. Explain in details the phases of ethical hacking
4. Describe new trends in ethical hacking
5. Describe defensive and offensive types of hacking.
6. Have an understanding of social engineering and malicious activities on data.

Indicative Content:

1. Phases of system penetration testing	3 Hours
2. Five phases of ethical hacking a) Reconnaissance, b) Gaining Access, c) Enumeration, d) Maintaining Access, and e) Covering your tracks	6 Hours
3. Offensive security, defensive security	6 Hours
4. Foot printing	3 Hours
5. System Hacking and defense tools and strategies	3 Hours
6. Preview of Viruses, worms and Trojans	3 Hours
7. Social Engineering and log data malicious activities	3 Hours
8. Hacking for Denial of service	3 Hours
9. Session hijacking	3 Hours
10. Hacking web servers	3 Hours
11. Web applications	3 Hours
12. SQL injection	3 Hours
13. Hacking Wireless networks	3 Hours
14. Mobile hacking	3 Hours
15. Ids, firewalls & honey pots	3 Hours
16. Buffer overflow	6 Hours
17. Cryptography	3 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

- | | |
|---|------|
| 1. Course work (Tests-20%, lab exercises-20%) | 40 % |
| 2. Final written exam | 60% |

Reading List:

1. Wright, J., & Cache, J. (2015). Hacking Exposed Wireless: Wireless Security Secrets & Solutions (3rd ed), McGraw-Hill Education, **ISBN-13:** 978-0071827638
2. McClure, S., Scambray, J., & Kurtz, G. (2012). Hacking Exposed 7: Network Security Secrets and Solutions (7th ed), McGraw-Hill Education, **ISBN-13:** 978-0071780285
3. Joel Scambray, Stuart McClure, George Kurtz, (2000) Hacking Exposed: Network Security Secrets & Solutions, (2nd ed), **ISBN-13:** 978-0072127485

Proposed Course Facilitator(s)

1. Dr. Drake Mirembe
2. Dr. Richard Ssekibuule

IT Law and Ethics

Course Name:	IT Law and Ethics
Course Code:	IST 3203
Course Level:	Year 3 Sem 2
Contact Hours:	45
Credit Units:	3 CUs
Pre-requisite Courses:	None

Course Description:

This course focuses on introducing students to salient legal aspects in the field of Information Technology. It aims at creating an understanding of the relevance of law to achievement of a successful career in the Information Technology, understanding the law and its impact on Information Technology as well as providing skills needed to respond to daily work challenges without negatively affecting the IT career demands.

The course primarily focuses on creating an understanding of professionalism and its demands in the field of IT, appreciating professional behavior of the IT specialist in the interaction with IT clients as well as appreciating the ethical conduct of professionals in

the IT field of practice. The students will be led to appreciate the practical differences between morality, ethics and legality, with the ultimate aim of equipping students with skills and attitudes that will enable them provide professional service to their clients and the public.

Course Objectives

The course aims at providing students with:

1. The ability to identify and discuss the major ethical principles that guide information management decision making as IT professionals
2. The basic background to develop their professional role in the workplace, beyond simply performing technical tasks assigned to them.
3. The general framework of the practical ethical and legal arena in which they will be practicing their IT skills in a Ugandan context.
4. Apply and promote ethical standards of practice.
5. Interpret professional values and obligations inherent in the IT Code of Ethics.

Course Learning Outcomes

Upon successful completion of this course, the student should be able to:

1. Develop research skills that incorporate critical thinking and problem solving, in order to recognize existing, potential, and unforeseen ethical and legal issues facing Informatics professionals and the stakeholders in the systems for which they are responsible
2. Identify, analyze, and explain issues of privacy, security and ethics as they affect and are affected by the use of Information Technology in the workplace and in daily life
3. Design, organize, and implement strategies for best ethical practices within an organization as they relate to the use of Information Technology in the Ugandan context
4. Communicate ethical standards clearly, concisely, and effectively using oral, written and visual forms
5. Interact cooperatively as a team member/leader to establish effective working relationships and contribute to the achievement of goals regarding the professional values and obligations inherent in the IT code of Ethics

Indicative Content:

The course will cover the following areas;

1. Understanding morality, nature of ethics and law	2 Hours
2. Professionalism and ethical conduct	2 Hours
3. Introduction to law and its relevance to the IT theory and practice.	2 Hours
4. Breach of Contract	2 Hours
5. IT Contracts	2 Hours
6. Letters of Intent	2 Hours
7. Interpretation of Contracts	6 Hours
8. Computer use and crime.	8 Hours
9. Intellectual property and the national and international legal	2 Hours

instruments on invention, innovation and computer development	
10.The Internet and Contract	3 Hours
11. Ownership and Domain Names	3 Hours
12.Web 2.0 and Defamation	3 Hours
13.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	8 Hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

Assessment will be in terms of

- | | |
|------------------------------|-----|
| 1. Coursework | 40% |
| 2. Final written examination | 60% |

Reading List:

1. Quinn, M.J. (2015). Ethics for the Information Age 6th Edition Addison-Wesley ISBN-10: 0133741621 | ISBN-13: 978 0133741629
2. Ben-Jacob, M. (2010). Computer Ethics: Integrating Across the Curriculum ISBN-13: 9780763778095, ISBN-10: 0763778095
3. Adams, A.A. & McCrindle, R. (2007) Pandora's Box: Social and Professional Issues of the Information Age
4. Bainbridge, D. (2004). Introduction to Computer Law. Pearson Longman, London
5. Kizza, J. M. (2003). Ethical and Social Issues in the Informational Age. 2nd edition. Springer-Verlag, New York, Inc. 2003
6. Quirk, P., Forder, J. (2003). Electronic Commerce and the Law. 2nd edition. John Wiley & Sons Australia ISBN 2003 0-470-80238-3

Proposed Course Facilitator(s)

1. Dr. Evelyn Kigozi Kahiigi

Information Systems Audit

Course Name: Information Systems Audit
Course Code: IST 3204

Course Level: Year 3 Sem 2
 Contact Hours: 45
 Credit Units: 3 CUs
 Pre-requisite Courses: BIT 2208 Systems Administration, BIS 2106 Data and Information Management II, BIS 2105 Information Systems Security and Risk Management

Course Description:

This course seeks to explore how enterprise-wide IT resources can be secured, managed, and leveraged through appropriate IT governance and internal controls. The most effective way to mitigate IT-associated risks is to design and implement IT audit and control mechanism with a risk management approach. IT must be systematically organized and monitored as a resource with carefully designed and executed IT policies to maximize its impacts. After all, firms in the digital economy leverage IT to gain a competitive advantage.

Course Objectives:

The objectives of this course are:

1. To enable students to comprehend general audit, information systems audit and control, IT governance and their applications to the business environment.
2. To enhance students' competency towards risk management, information systems audit, assurance, business continuity planning, disaster recovery planning, and internal control.
3. To develop students' critical understanding of Computer Assisted Audit Tools and Techniques (CAATTs) and its business applications for data extraction and analysis.
4. To gain insight into computer-assisted fraud and fraud detection techniques for business asset protection

Course Learning Outcomes:

By the end of this course, students should be able to:

1. Articulate the concepts of auditing and information systems audit and control.
2. Apply the IS audit methodology and formulate information security policy.
3. Evaluate the organization's IT governance, risk management, IS control and security architecture, business continuity plan, disaster recovery plan, and propose solutions in addressing related issues.
4. Develop knowledge and skills in the application of various types of computer-assisted audit tools and techniques.

Indicative Content:

1. Fundamentals of IS Audit and Control	6 hours
2. IS Audit Process	6 hours

3. IS Audit Management	6 hours
4. IS Governance	6 hours
5. Protection of Information Assets	6 hours
6. Business Continuity and Disaster Recovery	6 hours
7. Computer Assisted Audit Tools and Technologies (CAATT)	9 hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

- | | |
|---|-----|
| 1. Course work (Tests, practical exercises) | 20% |
| 2. Take home assignment | 20% |
| 3. Final written exam: | 60% |

Reading List:

1. Cascarino, R. E. (2012). *Auditor's Guide to IT Auditing + Software Demo* (Vol. 583). John Wiley & Sons.
2. Hall, J. A. (2010). *Information Technology Auditing*. Cengage Learning.
3. Johnstone, K., Gramling, A., & Rittenberg, L. E. (2013). *Auditing: A Risk-Based Approach to Conducting a Quality Audit*. Cengage Learning.
4. Moeller, R. R. (2010). *IT audit, control, and security* (Vol. 13). John Wiley & Sons.
5. Senft, S., & Gallegos, F. (2008). *Information technology control and audit*. CRC Press

Proposed Course Facilitator(s)

1. Dr. Aminah Zawedde
2. Ms. Fiona Ssozi-Mugarura

Software Systems Testing

Course Name: Software Systems Testing
 Course Code: IST 3205
 Course Level: Year 3 Sem 2

Contact Hours: 60
 Credit Units: 4 CUs
 Pre-requisite Courses: CSC 1214 Object Oriented Programming, BIS 2207 Applications Development,

Course Description

This course is a step by step description of software quality and software reliability engineering process. It includes introduction to software quality, prediction and measurement of software size and cost, software reliability engineering process, defining necessary reliability, developing operational profiles, decision making based on the test results, techniques to improve and predict software reliability, application of quality concept to agile and incremental software development processes. The focus is on the reliability of object-oriented software systems. A workshop (project) is designed to reinforce the presented material. In the workshop, the students will actually go through the estimation and evaluation of quality of a realistic software project.

Course Objectives

1. To introduce to the students the aspects of reliability and robustness of software
2. To introduce students to the role of software testers in the software development process
3. To expose students to the techniques of assessing software reliability
4. To enable the students understand the approaches and process of software testing

Course Learning Outcomes

Upon successful completion of this course the student will have ability to:

1. Explain the software reliability process and reliability growth models;
2. Demonstrate understanding of techniques to improve and predict software reliability; and
3. Understand and explain concepts of operational profiles and techniques to improve and predict software reliability
4. Prepare and execute software testing including approaches like black box testing, white box testing, unit testing, system testing and integration testing.

Indicative Content:

1. Introduction to software reliability process	6 Hours
2. Reliability growth models	8 Hours
3. Software reliability prediction and improvement	12 Hours
4. Preparation and execution of software testing	16 Hours
5. Testing Approaches (black box testing, white box testing, unit testing, system testing, and integration testing)	18 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

1. Course work (Tests, practical exercises, Take home assignment) 40%
2. Final written exam: 60%

Reading List

1. Musa, J.D. (2004). Software Reliability Engineering: More Reliable Software Faster and Cheaper, (632 p.), Authorhouse, 2nd edition-ISBN 1418493872.
2. Perry, W.E. (2000). Effective Methods for Software Testing, 2nd edition, John Wiley and Sons-ISBN: 0-471-35418-X.
3. Lyu, M.R. (1996). Handbook of Software Reliability Engineering, McGraw Hill-ISBN: 0-07-039400-8.
4. Musa,J.D., Lannini, A., & Okumoto, K. (1987). Software Reliability: Measurement, Prediction and Application, (621 p.), McGraw-Hill (1987).ISBN 0-07-044093-X.

Proposed Course Facilitator(s)

1. Dr. Richard Ssekibuule

Semester 5 – Systems Development Option

Project I

Course Name:	Project I
Course Code:	IST 3101
Course Level:	Year 3 Sem 1
Contact Hours:	75
Credit Units:	5 CUs
Pre-requisite Courses:	CSK 1101 Communication Skills, BIT 2207 Research Methodology

Course Description:

Project I is part of the BIST students' final year projects. It provides students with the skills to identify a business problem that needs an Information systems and/or technology solution, define objectives and write a research proposal that would be turned into a working system during their second semester. It enables students to apply

skills they have learned from other courses during their time of study especially research methodology and system development related courses.

Course Objectives

The aims of the course include:

1. To give the students experience in writing information technology research proposals that would provide IT solutions to real world problems affecting the industry at large.
2. Enable students to Review relevant literature that would inform the process of solving a given problem
3. Expose students to appropriate research methods to be used in solving a given problem
4. Introduce appropriate data collection techniques that can be used to gather data required to solve a given problem.
5. Train students in budgeting in order to realize the project
6. Educate students how to write an IT project research proposal that would be turned into a working system in the second semester of their study.

Course Learning Outcomes:

By the end of the course, the student should be able to:

1. Demonstrate expertise in writing information technology research proposals that would provide IT solutions to real world problems affecting the industry at large
2. Review relevant literature that would inform the process of solving a given problem
3. Identify an appropriate research method to be used in solving a given problem.
4. Use appropriate data collection techniques to gather data required to solve a given problem.
5. Develop a budget that would be used to realize the project
6. Write an IT project research proposal that would be turned into a working system in the second semester of their study.

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Field work
3. Online learning management systems
4. Class discussions and presentations
5. Industry based case studies

Mode of Assessment

- | | |
|---|-----|
| 1. Bi-weekly progress assessment by supervisor | 40% |
| 2. Final research proposal presentation to supervisor | 60% |

Reading List

1. Zikmund, W.G. (2010). Business Research Methods (8th Ed.) Thomson South Western
2. Leedy, P.D., & Ormrod, J.E. (2004). Practical Research: Planning and Design Paperback, Prentice Hall
3. Sounders, M., Lewis, P. & Thornhill, A. (2003). Research Methods for Students. 3rd edition, UK, Financial times, Prentice hall
4. Graziano, A.M, & Michael, L. (2006). Research Methods: A process of Inquiry Raulin, Hardcover, Prentice Hall

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Ms. Flavia Namagembe
3. Dr. Daudi Jjingo

Integrative Programming and Technologies

Course Name:	Integrative Programming and Technologies
Course Code:	IST 3106
Course Level:	Year 3 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIS 1206 Systems Analysis and Design, CSC 1214 Object Oriented Programming

Course Description:

An organization will typically use many different technologies that need to communicate and work with each other. This course covers the integration of different computer technologies to empower business processes. The course looks at systems integration with focus on communication mechanisms and data standardization. It also examines the various types of programming languages and their appropriate use. It also addresses the use of scripting languages, architectures, application programming interfaces and programming practices to facilitate the management, integration and security of the systems that support an organization.

Course Objectives:

1. To expose students to the underlying systems integration architectures.
2. To introduce students to the different technologies that organizations typically use to communicate and work with each other.
3. To equip students describe and contrast the various types of programming languages and their appropriate use.
4. To provide students with skills to analyze the use of scripting languages, architectures, application programming interfaces and programming practices

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Demonstrate the understanding of different types of systems integration architectures.
2. Evaluate disparate technologies that organizations typically use to communicate and work with each other.
3. Describe and contrast the various types of programming languages and their appropriate use.
4. Analyze the use of scripting languages, architectures, application programming interfaces and programming practices to facilitate the management, integration and security of the systems that support an organization.

Indicative Content:

1. Intersystem Communications and integration - Architectures for integrating systems DCOM, CORBA, RMI, Web services and middleware Network programming, Message and queuing services Low level data communications	8 Hours
2. Data Mapping and Exchange – Metadata, Data representation and encoding XML, DTD, XML schemas Parsing XML documents XSL, XSLT and XPath	8 Hours
3. Integrative Coding - Design patterns, Interfaces, Inheritance	12 Hours
4. Scripting Techniques - Scripting and the role of scripting languages, Creating and executing scripts, Influence of scripting on programming,	12 Hours
5. Software Security Practices - Evidence-based security vs. code access security, Best security coding practices Authentication to system resources and services, Encryption of data between systems and services	8 Hours
6. History of programming languages, Programming paradigms, Effects of scale, Virtual machines, Compiled vs., interpretative languages, Application vs., scripting languages, Adopt & adapt vs., make, Versioning and version control.	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

The students shall be evaluated through the

1. Coursework 40%
2. Final examination 60%

Reading List:

1. Konga, S.K. (2012). Basic Integrative Programming Technologies: Data Integration Technology/Architectures, ISBN-10: 3659104248. LAP LAMBERT Academic Publishing.
2. Britton C, & Bye P. (2004). Architectures and Middleware: Strategies for Building Large, Integrated Systems, Second Edition, ISBN-10: 0321246942. Addison-Wesley.
3. Liu, M. L. (2004). Distributed Computing: Principles and Applications, Pearson.
4. Anders, Mand Michael, Schwartzbach (2006), An Introduction to XML and Web Technologies, Pearson.
5. Kevin, H.G. (2008). XML: Visual Quick Start Guide, 2/e, Pearson Education.
6. Alan, S. & James, R.T. (2001). Design Patterns Explained: A New Perspective on Object-Oriented Design, 2/e, Addison-Wesley Professional.

Proposed Course Facilitator(s)

1. Dr. Florence Nameere Kivunike
2. Dr. Peter Khisa Wakholi
3. Mr. Emmanuel Mugejjera

Intelligent Systems

Course Name:	Intelligent Systems
Course Code:	IST 3107
Course Level:	Year 3 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	MTH 1110 Basic Mathematics

Course Description:

This course introduces the fundamental concepts and applications of intelligent systems. It introduces various concepts of popular intelligent systems techniques and how they can be applied to provide solutions to specific problems with a focus on information systems. The course also introduces the criteria for measuring the successful application of intelligent systems techniques

Course Objectives:

1. Introduce students to fundamental intelligent systems concepts that establish the foundation of applying intelligent systems to Information Systems related problems
2. Expose students to popular intelligent systems techniques that are suitable for solving various types of Information systems related problems
3. Train students on how to apply intelligent systems to information systems related problems

4. Explore limitations and / or challenges associated with intelligent systems and how to overcome them in the context of information systems applications.

Course Learning Outcomes:

By the end of this course, a student should be able to:

1. Explain key concepts associated with intelligent systems and how they can be applied to information systems related problems
2. Demonstrate knowledge in several intelligent systems approaches (e.g. expert systems, neural networks, and genetic algorithms, etc) and their application to information systems related problems
3. Apply intelligent systems to information systems related problems
4. Evaluate the application of intelligent systems in solving information systems related problems, and how to overcome them in the context of information systems applications.

Indicative Content:

1. Introduction to Intelligent Systems	16 Hours
2. Artificial intelligence agents	8 Hours
3. Problem solving strategies: a) Uninformed search b) Informed search c) Graph search	8 Hours
4. Intelligent systems development Methodologies and Case studies	
a) Knowledge Engineering /Intelligent Systems development phases i. Problem formulation ii. Knowledge acquisition iii. Knowledge representation and reasoning iv. Intelligent systems validation / evaluation	3 Hours
b) Expert systems i. Rule-based expert systems ii. Fuzzy expert systems iii. Frame-based expert systems	3 Hours
c) Artificial neural networks Different types of Artificial Neural Networks	3 Hours
d) Evolutionary computation i. Genetic algorithms ii. Genetic programming iii. Evolutionary strategies	3 Hours
e) Case-based reasoning	3 Hours
f) Intelligent software agents	3 Hours
g) Data mining	3 Hours
h) Natural language processing	3 Hours
i) Hybrid intelligent systems	3 Hours

TOTAL HOURS	60 HOURS
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Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

1. Course work
 - a) Tests 20%
 - b) Take home assignments, practical exercises 20%
2. Final written exam: 60%

Reading List:

1. Negnevitsky, M. (2011). *Artificial Intelligence: A guide to Intelligent Systems*, 3rd Edition. Publisher: Addison Wesley. ISBN: 140822574
2. Russell, S. & Norvig, P. (2009). *Artificial Intelligence: A Modern Approach*, 3rd Edition. Publisher: Prentice Hall. ISBN-10: 0-13-60425907, ISBN-13: 978-0-13-604259-4
3. Neapolitan, R.E. & Xia Jiang, (2012). *Contemporary Artificial Intelligence*. Chapman and Hall CRC.

Proposed Course Facilitator(s)

1. Dr. Peter Nabende
2. Dr. Ernest Mwebaze

Applications Development

Course Name: Applications Development
 Course Code: IST 3108
 Course Level: Year 3 Sem 1
 Contact Hours: 60
 Credit Units: 4 CUs
 Pre-requisite Courses: CSC 1214 Object Oriented Programming, BIS 1206 Systems Analysis and Design

Course Description:

In this course, Students will learn the basic concepts of program design, data structures, programming, problem solving, programming logic, and fundamental design techniques for event-driven programs. A fourth generation programming language like Vb.net will

be used. The course will incorporate the applications development life cycle: gathering requirements, designing a solution, implementing a solution in a programming language, and testing the completed application.

Course Objectives

The objectives of the course are to equip students with skills to;

1. Basic programming concepts, primitive data types and data structures offered by the development environment
2. Identifying appropriate data structure for modeling simple business problems
3. Be able to design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard Conditional and iterative structures and the definition of functions.
4. Be able to apply core program control structures

Course Learning Outcomes

After successful completion of this course, students should be able to:

1. Understand basic programming concepts and use primitive data types and data structures offered by the development environment
2. Choose an appropriate data structure for modeling simple business problems
3. Design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard Conditional and iterative structures and the definition of functions.
4. Apply core program control structures

Indicative Content:

1. Overview and history of programming languages	8 Hours
2. Program design	4 Hours
3. Software Development lifecycle	4 Hours
4. Prototyping / Agile development	4 Hours
5. Modular design	4 Hours
6. Object Oriented a Design	4 Hours
7. Event driven design	4 Hours
8. Techniques for modeling program structures	4 Hours
9. Coding in a fourth generation language e.g. VB.net	4 Hours
10. Input /Output (I/O) design	4 Hours
11. Data structures	4 Hours
12. Database access	4 Hours
13. Application integration	4 Hours
14. Unit testing, Usability Testing	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Lab practicals
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

1. Progressive assessment (tests and a developed application) 40%
2. Final written exam 60%

Reading List:

1. Hoffer, J.A., George, J. & Valacich, J. (2010). *Modern Systems Analysis and Design* (6th ed), Publisher: Addison Wesley.
2. O'Reilly (2003). *Programming Visual Basic .NET*, (2nd ed)
3. Sams (2003). *Sams Teach Yourself Visual Studio .NET in 21 Days*

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Mr. Henry Sserugunda

User Interface Design

Course Name:	User Interface Design
Course Code:	CSC 3110
Course Level:	Year 3 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIS 1206 Systems Analysis and Design, CSC 1214 Object Oriented Programming

Course Description:

The course introduces the principles of user interface development, focusing on design, implementation and evaluation.

Course Objectives:

The course aims at:

1. Training students in order for them to create efficient, flexible, usable and interactive User Interfaces (UI)
2. Providing students with the skills so that they are able identify system users, the tasks they want to carry out and the environment in which they will be working.
3. Exposing students to standard conceptual designing.
4. Enable students create useful User interfaces, in particular graphical user interfaces.

- Instructing students in the art of evaluating UIs;

Course Learning Outcomes:

By the end of this course, students will be able to:

- Develop efficient, flexible, usable and interactive User Interfaces(UI)
- Identify system users, the tasks they want to carry out and the environment in which they will be working;
- Create standard conceptual designs.
- Create useful User interfaces, in particular graphical user interfaces.
- Evaluate UIs

Indicative Content:

1. Usability, Design Principles and User-Centered Design	6 Hours
2. UI Software Architecture, Human Capabilities	6 Hours
3. Output Models, Input Models, Conceptual Models and Metaphors	6 Hours
4. Designing for collaboration and communication	6 Hours
5. Emotional interaction	6 Hours
6. The process of interaction design	6 Hours
7. Design, prototyping and construction	6 Hours
8. Graphic Design	6 Hours
9. UI Evaluation	6 Hours
10. User Testing, Experiment Design and Analysis	6 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

- Lectures
- Lab sessions
- Online learning management systems
- Class discussions and presentations
- Group project-based assignments

Mode of Assessment:

Assessment will be in form of

- | | |
|---------------------------------------|-----|
| 1. Coursework (Assignments and tests) | 40% |
| 2. Final written exam | 60% |

Reading List:

- Rogers, Y., Sharp, H., & Preece, J. (2011). Interaction design: beyond human-computer interaction.
- Norman, D. A. (2013). The design of everyday things: Revised and expanded edition. Basic books.

3. Nielsen, J. (1994). Usability engineering. Elsevier.
4. Mullet, K., & Sano, D. (1994). Designing visual interfaces: Communication oriented techniques.

Proposed Course Facilitator(s)

1. Dr. Raymond Mugwaya
2. Dr. Rehema Baguma
3. Mr. Jacob Katende

Semester 6 – Systems Development Option

Project II

Course Name:	Project II
Course Code:	IST 3201
Course Level:	Year 3 Sem 2
Contact Hours:	75
Credit Units:	5 CUs
Pre-requisite Courses:	IST 3101 Project I

Course Description:

This course builds on project I. Students use the knowledge and concepts acquired from research methodology and other relevant course units to implement their proposed solution to the problem and objectives defined in project I. Each student will pursue a lengthy project in any area of information systems development. The project will be specified, designed and implemented, with one of the Professors / lecturers as advisor / supervisor.

Course Objectives:

1. To enable students produce a working application (artifact) with guidance from their supervisors.
2. To train students in the art of report writing.

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Apply the skills and knowledge acquired during the course of study, to produce a working application/prototype (artifact).
2. Generate a report as an output of the project.

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Supervisor-student discussions
2. Group discussions
3. Fieldwork and demonstrations
4. Presentations

Mode of Assessment

- | | |
|---|-----|
| 1. Weekly progress assessment by supervisor | 40% |
| 2. Final project presentation to an examination panel | 60% |

Reading List:

1. Zikmund, W.G. (2010). Business Research Methods (8th Ed.) Thomson South Western
2. Leedy, P.D., & Ormrod, J.E. (2004). Practical Research: Planning and Design Paperback, Prentice Hall
3. Saunders, M., Lewis, P. & Thornhill, A. (2003). Research Methods for Students. 3rd edition, UK, Financial times, Prentice hall
4. Graziano, A.M, & Michael, L. (2006). Research Methods: A process of Inquiry Raulin, Hardcover, Prentice Hall

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Ms. Flavia Namagembe
3. Dr. Daudi Jjingo

IT Law and Ethics

Course Name:	IT Law and Ethics
Course Code:	IST 3203
Course Level:	Year 3 Sem 2
Contact Hours:	45
Credit Units:	3 CUs
Pre-requisite Courses:	None

Course Description:

This course focuses on introducing students to salient legal aspects in the field of Information Technology. It aims at creating an understanding of the relevance of law to achievement of a successful career in the Information Technology, understanding the law and its impact on Information Technology as well as providing skills needed to respond to daily work challenges without negatively affecting the IT career demands.

The course primarily focuses on creating an understanding of professionalism and its demands in the field of IT, appreciating professional behavior of the IT specialist in the interaction with IT clients as well as appreciating the ethical conduct of professionals in the IT field of practice. The students will be led to appreciate the practical differences between morality, ethics and legality, with the ultimate aim of equipping students with

skills and attitudes that will enable them provide professional service to their clients and the public.

Course Objectives

The course aims at providing students with:

6. The ability to identify and discuss the major ethical principles that guide information management decision making as IT professionals
7. The basic background to develop their professional role in the workplace, beyond simply performing technical tasks assigned to them.
8. The general framework of the practical ethical and legal arena in which they will be practicing their IT skills in a Ugandan context.
9. Apply and promote ethical standards of practice.
10. Interpret professional values and obligations inherent in the IT Code of Ethics.

Course Learning Outcomes

Upon successful completion of this course, the student should be able to:

6. Develop research skills that incorporate critical thinking and problem solving, in order to recognize existing, potential, and unforeseen ethical and legal issues facing Informatics professionals and the stakeholders in the systems for which they are responsible
7. Identify, analyze, and explain issues of privacy, security and ethics as they affect and are affected by the use of Information Technology in the workplace and in daily life
8. Design, organize, and implement strategies for best ethical practices within an organization as they relate to the use of Information Technology in the Ugandan context
9. Communicate ethical standards clearly, concisely, and effectively using oral, written and visual forms
10. Interact cooperatively as a team member/leader to establish effective working relationships and contribute to the achievement of goals regarding the professional values and obligations inherent in the IT code of Ethics

Indicative Content:

The course will cover the following areas;

14. Understanding morality, nature of ethics and law	2 Hours
15. Professionalism and ethical conduct	2 Hours
16. Introduction to law and its relevance to the IT theory and practice.	2 Hours
17. Breach of Contract	2 Hours
18. IT Contracts	2 Hours
19. Letters of Intent	2 Hours
20. Interpretation of Contracts	6 Hours
21. Computer use and crime.	8 Hours
22. Intellectual property and the national and international legal instruments on invention, innovation and computer development	2 Hours
23. The Internet and Contract	3 Hours

24. Ownership and Domain Names	3 Hours
25. Web 2.0 and Defamation	3 Hours
26. 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	8 Hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

5. Lectures
6. Online learning management systems
7. Class discussions and presentations
8. Group project-based assignments

Mode of Assessment:

Assessment will be in terms of

- | | |
|------------------------------|-----|
| 3. Coursework | 40% |
| 4. Final written examination | 60% |

Reading List:

7. Quinn, M.J. (2015). Ethics for the Information Age 6th Edition Addison-Wesley ISBN-10: 0133741621 | ISBN-13: 978 0133741629
8. Ben-Jacob, M. (2010). Computer Ethics: Integrating Across the Curriculum ISBN-13: 9780763778095, ISBN-10: 0763778095
9. Adams, A.A. & McCrindle, R. (2007) Pandora's Box: Social and Professional Issues of the Information Age
10. Bainbridge, D. (2004). Introduction to Computer Law. Pearson Longman, London
11. Kizza, J. M. (2003). Ethical and Social Issues in the Informational Age. 2nd edition. Springer-Verlag, New York, Inc. 2003
12. Quirk, P., Forder, J. (2003). Electronic Commerce and the Law. 2nd edition. John Wiley & Sons Australia ISBN 2003 0-470-80238-3

Proposed Course Facilitator(s)

2. Dr. Evelyn Kigozi Kahiigi

System Integration and Deployment

Course Name: System Integration and Deployment
Course Code: IST 3206
Course Level: Year 3 Sem 2

Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: BIT 3108 IST Project Management, BIT 2207 Research Methodology

Course Description:

This course is designed to provide students with an understanding of Systems Integration (SI) processes, approaches, drivers, tools and techniques required for successful SI, critical success factors, and best practices. The course focuses on how a proposed system will be integrated with other existing or planned systems. It addresses the System Integration problem using architectures as the basis and then addresses the evaluation of the architectures in terms of the capabilities they provide. Case studies and examples from the Information Technology (IT), energy, and financial services industry will be used to illustrate the concepts discussed. The students will learn the theory and practice of business process integration, legacy integration, new systems integration, business-to-business integration, integration of commercial-off-the-shelf (COTS) products, interface control and management, testing, integrated program management, integrated Business Continuity Planning (BCP). Specific focus will be given to issues of interface integration and interoperability of systems.

Course Objectives:

The aims of the course include:

1. To present students with the concepts applicable to SI, considerations for enterprise integration platform selection and middleware platforms applicable to SI and deployment.
2. To provide students with an understanding of the technical and business process issues involved in systems integration.
3. To enable students understand SI frameworks, integration issues and best practices to ensure successful System Integration.
4. To introduce students to mapping software architecture created in a design to a physical system architecture that executes it.
5. To provide practical skills required for modeling, planning, installing and testing an enterprise integration middleware platform.

Course Learning Outcomes:

On completion of this course, the students will be able to:

1. Have an understanding of concepts applicable to SI, considerations for enterprise integration platform selection and middleware platforms applicable to SI and deployment.
2. Appreciate the technical and business process issues involved in systems integration.
3. Explain SI frameworks, integration issues and best practices to ensure successful System Integration.
4. Map software architecture created in a design to a physical system architecture that executes it.

5. Model, plan, install and test an enterprise integration middleware platform.

Indicative Content:

1. Challenges of Systems Integration – Human, Organizational, Societal Cultural, Economic, and Technological aspects	8 Hours
2. Processes, approaches, drivers, tools and techniques required for successful SI, critical success factors, and best practices in Systems Integration;	8 Hours
3. The Role of Architectures in Systems Integration;	4 Hours
4. Systems Interoperability;	4 Hours
5. Measures of Performance and Effectiveness;	4 Hours
6. The theory and practice of business process integration, legacy integration, new systems integration, business-to-business integration, integration of commercial-off-the-shelf (COTS) products, integrated program management, integrated Business Continuity Planning (BCP).	8 Hours
7. Infrastructure, middleware and platforms for Enterprise systems integration and deployment	4 Hours
8. Techniques – data warehouses, extending frameworks, wrappers, glue, facades	4 Hours
9. Testing/evaluation/benchmarking	4 Hours
10. System release: pilot and acceptance testing and defect repair	4 Hours
11. System support strategies and user support plans	4 Hours
12. Enterprise deployment models and architectures	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

Assessment will be in form of

- | | |
|---|-----|
| 1. Coursework (tests and practical assignments) | 40% |
| 2. Final written examination | 60% |

Reading List

1. Bainey, K.R. (2004). Integrated IT project management: a model-centric approach. Artech House.

2. Booher, H.R. (2003). Handbook of human systems integration (Vol. 23). John Wiley & Sons.
3. Sage, A.P., & Rouse, W.B. (2009). Handbook of systems engineering and management. John Wiley & Sons.

Proposed Course Facilitator(s)

1. Ms. Margaret Nagwovuma

Information Systems Audit

Course Name:	Information Systems Audit
Course Code:	IST 3204
Course Level:	Year 3 Sem 2
Contact Hours:	45
Credit Units:	3 CUs
Pre-requisite Courses:	BIT 2208 Systems Administration, BIS 2106 Data and Information Management II, BIS 2105 Information Systems Security and Risk Management

Course Description:

This course seeks to explore how enterprise-wide IT resources can be secured, managed, and leveraged through appropriate IT governance and internal controls. The most effective way to mitigate IT-associated risks is to design and implement IT audit and control mechanism with a risk management approach. IT must be systematically organized and monitored as a resource with carefully designed and executed IT policies to maximize its impacts. After all, firms in the digital economy leverage IT to gain a competitive advantage.

Course Objectives:

The objectives of this course are:

1. To enable students to comprehend general audit, information systems audit and control, IT governance and their applications to the business environment.
2. To enhance students' competency towards risk management, information systems audit, assurance, business continuity planning, disaster recovery planning, and internal control.
3. To develop students' critical understanding of Computer Assisted Audit Tools and Techniques (CAATTs) and its business applications for data extraction and analysis.
4. To gain insight into computer-assisted fraud and fraud detection techniques for business asset protection

Course Learning Outcomes:

By the end of this course, students should be able to:

1. Articulate the concepts of auditing and information systems audit and control.
2. Apply the IS audit methodology and formulate information security policy.

3. Evaluate the organization's IT governance, risk management, IS control and security architecture, business continuity plan, disaster recovery plan, and propose solutions in addressing related issues.
4. Develop knowledge and skills in the application of various types of computer-assisted audit tools and techniques.

Indicative Content:

1. Fundamentals of IS Audit and Control	6 hours
2. IS Audit Process	6 hours
3. IS Audit Management	6 hours
4. IS Governance	6 hours
5. Protection of Information Assets	6 hours
6. Business Continuity and Disaster Recovery	6 hours
7. Computer Assisted Audit Tools and Technologies (CAATT)	9 hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

- | | |
|---|-----|
| 1. Course work (Tests, practical exercises) | 20% |
| 2. Take home assignment | 20% |
| 3. Final written exam: | 60% |

Reading List:

1. Cascarino, R.E. (2012). *Auditor's Guide to IT Auditing + Software Demo* (Vol. 583). John Wiley & Sons.
2. Senft, S., & Gallegos, F. (2008). *Information technology control and audit*. CRC Press
3. Hall, J. A. (2010). *Information Technology Auditing*. Cengage Learning.
4. Johnstone, K., Gramling, A., & Rittenberg, L. E. (2013). *Auditing: A Risk-Based Approach to Conducting a Quality Audit*. Cengage Learning.
5. Moeller, R. R. (2010). *IT audit, control, and security* (Vol. 13). John Wiley & Sons.

Proposed Course Facilitator(s)

3. Dr. Aminah Zawedde
4. Ms. Fiona Ssozi-Mugarura

Software Systems Testing

Course Name: Software Systems Testing
Course Code: IST 3205
Course Level: Year 3 Sem 2
Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: CSC 1214 Object Oriented Programming, BIS 2207 Applications Development,

Course Description

This course is a step by step description of software quality and software reliability engineering process. It includes introduction to software quality, prediction and measurement of software size and cost, software reliability engineering process, defining necessary reliability, developing operational profiles, decision making based on the test results, techniques to improve and predict software reliability, application of quality concept to agile and incremental software development processes. The focus is on the reliability of object-oriented software systems. A workshop (project) is designed to reinforce the presented material. In the workshop, the students will actually go through the estimation and evaluation of quality of a realistic software project.

Course Objectives

5. To introduce to the students the aspects of reliability and robustness of software
6. To introduce students to the role of software testers in the software development process
7. To expose students to the techniques of assessing software reliability
8. To enable the students understand the approaches and process of software testing

Course Learning Outcomes

Upon successful completion of this course the student will have ability to:

5. Explain the software reliability process and reliability growth models;
6. Demonstrate understanding of techniques to improve and predict software reliability; and
7. Understand and explain concepts of operational profiles and techniques to improve and predict software reliability
8. Prepare and execute software testing including approaches like black box testing, white box testing, unit testing, system testing and integration testing.

Indicative Content:

6. Introduction to software reliability process	6 Hours
7. Reliability growth models	8 Hours
8. Software reliability prediction and improvement	12 Hours
9. Preparation and execution of software testing	16 Hours
10. Testing Approaches (black box testing, white box testing, unit	18 Hours

testing, system testing, and integration testing)	
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

5. Lectures
6. Online learning management systems
7. Class discussions and presentations
8. Group project-based assignments

Mode of Assessment:

3. Course work (Tests, practical exercises, Take home assignment) 40%
4. Final written exam: 60%

Reading List

5. Musa, J.D. (2004). Software Reliability Engineering: More Reliable Software Faster and Cheaper, (632 p.), Authorhouse, 2nd edition-ISBN 1418493872.
6. Perry, W.E. (2000). Effective Methods for Software Testing, 2nd edition, John Wiley and Sons-ISBN: 0-471-35418-X.
7. Lyu, M.R. (1996). Handbook of Software Reliability Engineering, McGraw Hill-ISBN: 0-07-039400-8.
8. Musa, J.D., Lannini, A., & Okumoto, K. (1987). Software Reliability: Measurement, Prediction and Application, (621 p.), McGraw-Hill (1987).ISBN 0-07-044093-X.

Proposed Course Facilitator(s)

2. Dr. Richard Ssekibuule

Semester 5 – Information Systems Management Option

Project I

Course Name:	Project I
Course Code:	IST 3101
Course Level:	Year 3 Sem 1
Contact Hours:	75
Credit Units:	5 CUs
Pre-requisite Courses:	CSK 1101 Communication Skills, BIT 2207 Research Methodology

Course Description:

Project I is part of the BIST students' final year projects. It provides students with the skills to identify an information and/or process management problem, define objectives and write a research proposal that would be turned into a working system during their second semester. It enables students to apply skills they have learned from other courses during their time of study especially research methodology and system development related courses.

Course Objectives

1. To give the students experience in writing information technology research proposals that would provide IT solutions to real world problems affecting the industry at large.
2. Enable students to Review relevant literature that would inform the process of solving a given problem
3. Expose students to appropriate research methods to be used in solving a given problem
4. Introduce appropriate data collection techniques that can be used to gather data required to solve a given problem.
5. Train students in budgeting in order to realize the project
6. Educate students how to write an IT project research proposal that would be turned into a working system in the second semester of their study.

Course Learning Outcomes:

By the end of the course, the student should be able to:

1. Demonstrate expertise in writing information technology research proposals that would provide IT solutions to real world problems affecting the industry at large
2. Review relevant literature that would inform the process of solving a given problem
3. Identify an appropriate research method to be used in solving a given problem.
4. Use appropriate data collection techniques to gather data required to solve a given problem.
5. Develop a budget that would be used to realize the project
6. Write an IT project research proposal that would be turned into a working system in the second semester of their study.

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Field work
3. Online learning management systems
4. Class discussions and presentations
5. Industry based case studies

Mode of Assessment

1. Bi-weekly progress assessment by supervisor 40%
2. Final research proposal presentation to supervisor 60%

Reading List

1. Zikmund, W.G. (2010). Business Research Methods (8th Ed.) Thomson South Western
2. Leedy, P.D., & Ormrod, J.E. (2004). Practical Research: Planning and Design Paperback, Prentice Hall
3. Sounders, M., Lewis, P. & Thornhill, A. (2003). Research Methods for Students. 3rd edition, UK, Financial times, Prentice hall
4. Graziano, A.M, & Michael, L. (2006). Research Methods: A process of Inquiry Raulin, Hardcover, Prentice Hall

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Ms. Flavia Namagembe
3. Dr. Daudi Jjingo

Applications Development

Course Name: Applications Development
Course Code: IST 3108
Course Level: Year 3 Sem 1
Contact Hours: 60
Credit Units: 4 CUs
Pre-requisite Courses: CSC 1214 Object Oriented Programming, BIS 1206 Systems Analysis and Design

Course Description:

In this course, Students will learn the basic concepts of program design, data structures, programming, problem solving, programming logic, and fundamental design techniques for event-driven programs. A fourth generation programming language like Vb.net will be used. The course will incorporate the applications development life cycle: gathering

requirements, designing a solution, implementing a solution in a programming language, and testing the completed application.

Course Objectives

The objectives of the course are to equip students with skills to;

1. Basic programming concepts, primitive data types and data structures offered by the development environment
2. Identifying appropriate data structure for modeling simple business problems
3. Be able to design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard Conditional and iterative structures and the definition of functions.
4. Be able to apply core program control structures

Course Learning Outcomes

After successful completion of this course, students should be able to:

1. Understand basic programming concepts and use primitive data types and data structures offered by the development environment
2. Choose an appropriate data structure for modeling simple business problems
3. Design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard Conditional and iterative structures and the definition of functions.
4. Apply core program control structures

Indicative Content:

1. Overview and history of programming languages	8 Hours
2. Program design	4 Hours
3. Software Development lifecycle	4 Hours
4. Prototyping / Agile development	4 Hours
5. Modular design	4 Hours
6. Object Oriented a Design	4 Hours
7. Event driven design	4 Hours
8. Techniques for modeling program structures	4 Hours
9. Coding in a fourth generation language e.g. VB.net	4 Hours
10. Input /Output (I/O) design	4 Hours
11. Data structures	4 Hours
12. Database access	4 Hours
13. Application integration	4 Hours
14. Unit testing, Usability Testing	4 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Lab practicals
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

- | | |
|---|-----|
| 1. Tests | 10% |
| 2. Practical Assignment (Developed application) | 30% |
| 3. Final written exam | 60% |

Reading List:

1. Hoffer, J.A., George, J. & Valacich, J. (2010). *Modern Systems Analysis and Design* (6th Edition), Publisher: Addison Wesley.
2. O'Reilly (2003). *Programming Visual Basic .NET*, Second Edition
3. Sams (2003). *Sams Teach Yourself Visual Studio .NET in 21 Days*

Proposed Course Facilitator(s)

1. Dr. Peter Khisa Wakholi
2. Mr. Henry Sserugunda

Data Warehousing and Business Intelligence

Course Name: Data Warehousing and Business Intelligence
 Course Code: IST 3109
 Course Level: Year 3 Sem 1
 Contact Hours: 60
 Credit Units: 4 CUs
 Pre-requisite Courses: BIS 2106 Data and Information Management II

Course Description:

This course provides candidates with practical and theoretical skills in data and information management technologies so as to provide decision support capabilities. The course provides skills on building of data warehouses, managing and querying data warehouses and utilization of business intelligence for decision-making. Modeling techniques for futuristic prediction is also covered.

Course Objectives:

The aims of this course are to:

1. Make students understand the role and operation of data warehouses
2. Equip students with skills of developing data warehouses
3. Equip students with skills of maintaining existing data warehouses

- Equip students with skills of manipulating data warehouses to generate information for business decision making

Course Learning Outcomes:

After successfully completing this course, students should be able to:

- Explain how data warehousing combined with good business intelligence can increase a company’s bottom line and the different forms of business intelligence. Distinguish between on-line transaction processing (OLTP) and online analytical processing (OLAP); describe how structured, semi-structured, and unstructured data are all essential elements of enterprise information and knowledge management.
- Create a simple data warehouse (“data mart”) and develop dimensional models from which key data for critical decision-making can be extracted.
- Load extracted and transformed data into the data warehouse.
- Understand the different kinds of data mining algorithms and sketch out the process for extracting data from disparate databases and data sources.

Indicative Content:

Building on the transactional database understanding gained in during the pre-requisite courses, this course will cover topics such as;

1. Data warehouse concepts: partitioning, granularity, record of source, and metadata	8 Hours
2. Building viable decision support environments.	8 Hours
3. Architect development	8 Hours
4. Use of operational data stores, and transactional systems	8 Hours
5. Data migration and integration	8 Hours
6. On-line analytic processing	8 Hours
7. ROLAP vs MOLAP	4 Hours
8. Data mining.	8 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

- Lectures
- Lab practicals
- Online learning management systems
- Class discussions and presentations
- Group project-based assignments

Mode of Assessment:

- | | |
|--------------------------|-----|
| 1. Tests | 20% |
| 2. Practical Assignments | 20% |

3. Final written exam: 60%

Reading List:

1. Ponniah, P. (2011). *Data warehousing fundamentals for IT Professionals*, 2nd Edition. Publisher: John Wiley & Sons.
2. Haertzen, D. (2012). *The Analytical Puzzle: Profitable Data Warehousing, Business Intelligence and Analytics*. Publisher: Technics Publications Llc.
3. Khan, A. (2011). *Business Intelligence and Data Warehousing Simplified: 500 Questions, Answers, & Tips*. Publisher: International Pub Marketing.
4. Taniar, D. (2009). *Progressive Methods in Data Warehousing and Business Intelligence: Concepts and Competitive Analytics*. Illustrated Edition. Publisher: IGI Global Snippet.
5. Roland Bouman, R. (2009) Pentaho Solutions: *Business Intelligence and Data Warehousing with Pentaho and MySQL*.

Proposed Course Facilitator(s)

1. Mr. Richard Mayanja
2. Ms. Hawa Nyende
3. Ms. Alice Mugisha

Business Process Management

Course Name:	Business Process Management
Course Code:	IST 3110
Course Level:	Year 3 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	None

Course Description:

This course introduces the fundamentals of business process management (BPM) that will be used to systematically analyze, improve and automate business processes. Students will learn the techniques and tools that will be used for process identification, process discovery, process analysis, process redesign and improvement, process automation and monitoring. Students will learn how to apply these techniques and tools to a wide range of examples and case studies that will show the power of BPM in practice.

Course Objectives:

1. Equip students with skills needed to identify business processes within an organization.
2. Equip students with skills necessary to document business processes using different business process modeling techniques.
3. Make students understand qualitative and quantitative techniques useful for the analysis of the performance of business processes.

4. Equip students with skills necessary to identify and analyze business improvement opportunities based on business process models.
5. Make students understand how IT can effectively be used to build process automation solutions that realise the benefits of process improvement.

Course Learning Outcomes:

After successfully completing this course, students should be able to:

1. Identify business processes within an organization, study their boundaries and interrelations, and prioritize their management using different criteria.
2. Document business processes at different levels of detail using contemporary business process modeling techniques.
3. Apply qualitative and quantitative techniques to analyze the performance of business processes and to assess the impact of business process changes
4. Identify and analyze business improvement opportunities based on business process models.
5. Use IT effectively to build process automation solutions that realise the benefits of process improvement.

Indicative Content:

1. Introduction to Business Process Management	4 Hours
2. Essential Business Process Modelling	14 Hours
3. Process Discovery	8 Hours
4. Qualitative Process Analysis	8 Hours
5. Quantitative Process Analysis	12 Hours
6. Process Redesign	4 Hours
7. Process Automation	8 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

- | | |
|--------------------------|-----|
| 1. Tests | 20% |
| 2. Practical Assignments | 20% |
| 3. Final written exam: | 60% |

Reading List:

1. Dumas, M., La Rosa, M., Mendling, J., & Reijers, H.A. (2013). Fundamentals of business process management. Berlin: Springer
2. Weske, M. (2007) Business Process Management: Concepts, Languages, Architecture (2nd Ed). Springer
3. Jeston, J. & Nelis, J. (2008) Business Process Management: Practical Guidelines to Successful Implementations. Elsevier

Proposed Course Facilitator(s)

1. Dr. Joyce Nakatumba-Nabende
2. Dr. Peter Khisa Wakholi
3. Dr. Mercy Amiyo

Information Systems Architecture

Course Name:	Information Systems Architecture
Course Code:	IST 3111
Course Level:	Year 3 Sem 1
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	IST 1101 Foundations of Information Systems and Technology

Course Description:

This course unit helps a student to understand principles and procedures that need to be considered before and during the development of information systems that effectively support business operations that enhance service delivery in various types of communities and societies. These principles and procedures are orchestrated in what is termed as Information Systems Architectures (ISAs).

Course Objectives:

This course aims to:

1. Provide an understanding of the role of ICTs in (dynamic) organization environments; Knowledge on the principles and procedures to viewing IT and business processes as entities that are coherent and integral for organizations to be agile and transparent in their operations.
2. Provide an understanding the relevance of architectures in general (and information systems architecture in particular) in planning organization transformations or strategy implementations
3. Provide an understanding of the principles and procedures of business architectures, data architectures, application architectures, technology architectures and the relationship between these.
4. Equip students with principles and procedures to design or create a Business Architecture, Information systems architecture, and Technology Architecture for any organization.

- Equip students with knowledge on validating models of business architectures and information systems architectures

Course Learning Outcomes:

At the end of this course, a student should be able to:

- Demonstrate an understanding of the coherent and integral role of IT and business processes in organizations.
- Demonstrate an understanding of the relevance of architectures in general and information systems architectures in planning organization transformations or strategy implementations
- Demonstrate an understanding of the principles and procedures of business architectures, data architectures, application architectures, and technology architectures and the relationship between them.
- Design or create a Business Architecture, an Information systems architecture (i.e. data architecture and applications architecture), and technology architecture for any organization.
- Validate models of business architectures, information systems architectures, and technology architectures.

Indicative Content:

1. General architectures and information systems architecture in planning organization transformations or strategy implementations	12 Hours
2. Enterprise architectures (<i>Relationship between Business architectures, data architectures, and application architectures</i>).	15 Hours
3. Principles and procedures of developing business architectures and information systems architectures (<i>data architectures and application architectures</i>)	15 Hours
4. Design and validation of business architectures, information systems architectures, technology architectures	18 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

- Lectures
- Online learning management systems
- Class discussions and presentations
- Group project-based assignments

Mode of Assessment:

- | | |
|-------------------------------------|-----|
| 1. Course work (tests, assignments) | 20% |
| 2. Projects | 20% |
| 3. Final written exam | 60% |

Reading List:

1. Scott, A. B. (2005). *An Introduction to Enterprise Architecture – Linking Business and Technology* (2nd edition). Publisher: Author House, Indiana.
2. Spewak, S.H. (1992). *Enterprise Architecture Planning: Developing a Blue Print for Data, Applications, and Technology*. Publisher: John Wiley and Sons Inc, New York.
3. Jeanne, W.R., Weill, P. & Robertson, D. (2006). *Enterprise Architecture as Strategy – Creating a Foundation for Business Execution*. Publisher: Harvard Business School Press, Boston.
4. Dietz, J. (2008). *Architecture: Building Strategy into Design*. Netherlands Architecture Forum, Academic Service – SDU, The Hague (2008). ISBN 9789012580861.

Proposed Course Facilitator(s)

1. Dr. Agnes Nakakawa
2. Dr. Josephine Nabukenya
3. Ms. Flavia Namagembe

Semester 6 – Information Systems Management Option

Project II

Course Name: Project II
Course Code: IST 3201
Course Level: Year 3 Sem 2
Contact Hours: 75
Credit Units: 5 CUs
Pre-requisite Courses: IST 3101 Project I

Course Description:

This course builds on project I. Students use the knowledge and concepts acquired from research methodology and other relevant course units to implement their proposed solution to the problem and objectives defined in project I. Each student will pursue a lengthy project in any area of Information and/or process management. The project will be specified, designed and implemented, with one of the Professors / lecturers as advisor / supervisor.

Course Objectives:

1. To enable students produce a working application (artifact) with guidance from their supervisors.
2. To train students in the art of report writing.

Course Learning Outcomes:

On completion of this course unit, the students will be able to:

1. Apply the skills and knowledge acquired during the course of study, to produce a working application/prototype (artifact).
2. Generate a report as an output of the project.

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Supervisor-student discussions
2. Group discussions
3. Fieldwork and demonstrations
4. Presentations

Mode of Assessment

1. Weekly progress assessment by supervisor 40%
2. Final project presentation to an examination panel 60%

Reading List:

1. Zikmund, W.G. (2010). Business Research Methods (8th Ed.) Thomson South Western
2. Leedy, P.D., & Ormrod, J.E. (2004). Practical Research: Planning and Design Paperback, Prentice Hall
3. Sounders, M., Lewis, P. & Thornhill, A. (2003). Research Methods for Students. 3rd edition, UK, Financial times, Prentice hall
4. Graziano, A.M, Michael, L. (2006). Research Methods: A process of Inquiry Raulin, Hardcover, Prentice Hall

Proposed Course Facilitator(s)

4. Dr. Peter Khisa Wakholi
5. Ms. Flavia Namagembe
6. Dr. Daudi Jjingo

IT Law and Ethics

Course Name:	IT Law and Ethics
Course Code:	IST 3203
Course Level:	Year 3 Sem 2
Contact Hours:	45
Credit Units:	3 CUs
Pre-requisite Courses:	None

Course Description:

This course focuses on introducing students to salient legal aspects in the field of Information Technology. It aims at creating an understanding of the relevance of law to achievement of a successful career in the Information Technology, understanding the law and its impact on Information Technology as well as providing skills needed to respond to daily work challenges without negatively affecting the IT career demands.

The course primarily focuses on creating an understanding of professionalism and its demands in the field of IT, appreciating professional behavior of the IT specialist in the interaction with IT clients as well as appreciating the ethical conduct of professionals in the IT field of practice. The students will be led to appreciate the practical differences between morality, ethics and legality, with the ultimate aim of equipping students with skills and attitudes that will enable them provide professional service to their clients and the public.

Course Objectives

The course aims at providing students with:

11. The ability to identify and discuss the major ethical principles that guide information management decision making as IT professionals
12. The basic background to develop their professional role in the workplace, beyond simply performing technical tasks assigned to them.

13. The general framework of the practical ethical and legal arena in which they will be practicing their IT skills in a Ugandan context.
14. Apply and promote ethical standards of practice.
15. Interpret professional values and obligations inherent in the IT Code of Ethics.

Course Learning Outcomes

Upon successful completion of this course, the student should be able to:

11. Develop research skills that incorporate critical thinking and problem solving, in order to recognize existing, potential, and unforeseen ethical and legal issues facing Informatics professionals and the stakeholders in the systems for which they are responsible
12. Identify, analyze, and explain issues of privacy, security and ethics as they affect and are affected by the use of Information Technology in the workplace and in daily life
13. Design, organize, and implement strategies for best ethical practices within an organization as they relate to the use of Information Technology in the Ugandan context
14. Communicate ethical standards clearly, concisely, and effectively using oral, written and visual forms
15. Interact cooperatively as a team member/leader to establish effective working relationships and contribute to the achievement of goals regarding the professional values and obligations inherent in the IT code of Ethics

Indicative Content:

The course will cover the following areas;

27. Understanding morality, nature of ethics and law	2 Hours
28. Professionalism and ethical conduct	2 Hours
29. Introduction to law and its relevance to the IT theory and practice.	2 Hours
30. Breach of Contract	2 Hours
31. IT Contracts	2 Hours
32. Letters of Intent	2 Hours
33. Interpretation of Contracts	6 Hours
34. Computer use and crime.	8 Hours
35. Intellectual property and the national and international legal instruments on invention, innovation and computer development	2 Hours
36. The Internet and Contract	3 Hours
37. Ownership and Domain Names	3 Hours
38. Web 2.0 and Defamation	3 Hours
39. 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	8 Hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

9. Lectures
10. Online learning management systems
11. Class discussions and presentations
12. Group project-based assignments

Mode of Assessment:

Assessment will be in terms of

- | | |
|------------------------------|-----|
| 5. Coursework | 40% |
| 6. Final written examination | 60% |

Reading List:

13. Quinn, M.J. (2015). Ethics for the Information Age 6th Edition Addison-Wesley ISBN-10: 0133741621 | ISBN-13: 978 0133741629
14. Ben-Jacob, M. (2010). Computer Ethics: Integrating Across the Curriculum ISBN-13: 9780763778095, ISBN-10: 0763778095
15. Adams, A.A. & McCrindle, R. (2007) Pandora's Box: Social and Professional Issues of the Information Age
16. Bainbridge, D. (2004). Introduction to Computer Law. Pearson Longman, London
17. Kizza, J. M. (2003). Ethical and Social Issues in the Informational Age. 2nd edition. Springer-Verlag, New York, Inc. 2003
18. Quirk, P., Forder, J. (2003). Electronic Commerce and the Law. 2nd edition. John Wiley & Sons Australia ISBN 2003 0-470-80238-3

Proposed Course Facilitator(s)

3. Dr. Evelyn Kigozi Kahiigi

Information Systems Strategy, Management and Acquisition

Course Name:	Information Systems Strategy, Management and Acquisition
Course Code:	IST 3207
Course Level:	Year 3 Sem 2
Contact Hours:	60
Credit Units:	4 CUs
Pre-requisite Courses:	BIS 1206 Systems Analysis and Design

Course Description:

This course explores the issues and approaches in managing the information systems function in organizations and how the IS function integrates / supports / enables various types of organizational capabilities. It takes a senior management perspective in exploring the acquisition, development and implementation of plans and policies to

achieve efficient and effective information systems. The course addresses issues relating to defining the high-level IS infrastructure and the systems that support the operational, administrative and strategic needs of the organization. The remainder of the course is focused on developing an intellectual framework that will allow leaders of organizations to critically assess existing IS infrastructures and emerging technologies as well as how these enabling technologies might affect organizational strategy. The ideas developed and cultivated in this course are intended to provide an enduring perspective that can help leaders make sense of an increasingly globalized and technology intensive business environment.

Course Objectives:

1. Explain to students the various functions and activities within the information systems area, including the role of IT management and the CIO, structuring of IS management within an organization, and managing IS professionals within the firm
2. To explain to students the role of information systems in enabling core and supportive business processes as well as those that interface with suppliers and customers
3. Provide students with an understanding of how IS represents a key source of competitive advantage for firms, understand the concepts of information economics at the enterprise level, maximize business value of IS and evaluate the issues/challenges associated with incorporating IS into a firm
4. Expose students to the existing and emerging information technologies, the functions of IS, role of IT control and service management frameworks and its impact on the organizational operations
5. To equip students with knowledge and skills to make strategic decisions concerning acquiring IS resources and capabilities including the ability to evaluate the different sourcing options
6. Equip students with skills for applying information to the needs of different industries and areas

Course Learning Outcomes:

After successful completion of this course, students should be able to:

1. Describe the various functions and activities within the information systems area, including the role of IT management and the CIO, structuring of IS management within an organization, and managing IS professionals within the firm
2. Demonstrate understanding of how information systems enable core and supportive business processes as well as those that interface with suppliers and customers
3. Demonstrate how IS represents a key source of competitive advantage for firms, understand the concepts of information economics at the enterprise level, maximize the business value of IS and evaluate the issues/challenges associated with incorporating IS into a firm

4. Describe existing and emerging information technologies, the functions of IS, role of IT control and service management frameworks and its impact on the organizational operations
5. Make strategic decisions are made concerning acquiring IS resources and capabilities including the ability to evaluate the different sourcing options
6. Apply information to the needs of different industries and areas

Indicative Content:

1. The Information Systems function	3 Hours
2. Information Systems strategic alignment	6 Hours
3. Strategic use of information	3 Hours
4. Impact of Information Systems on organizational structure and processes	6 Hours
5. Information Systems economics	3 Hours
6. Information Systems planning	3 Hours
7. Role of Information Systems in defining and shaping competition	6 Hours
8. Managing the information systems function	6 Hours
9. Financing and evaluating the performance of information technology investments and operations	6 Hours
10. Acquiring information technology resources and capabilities	6 Hours
11. Using Information Systems and Technology governance frameworks	6 Hours
12. Information Systems risk management	6 Hours
TOTAL HOURS	60 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery

1. Lectures
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

- | | |
|--------------------------|-----|
| 1. Tests | 20% |
| 2. Take home assignments | 20% |
| 3. Final written exam | 60% |

Reading List:

1. Sousa, K.J., & Oz, E. (2015). Management Information Systems (7th ed). ISBN_13: 978 182 518 6139
2. Clark, S. (2007). *Information Systems Strategic Management: An integrated approach*, 2nd Edition. Publisher: Routledge.

3. Robson, W. (1996). *Strategic Management and Information Systems: An Integrated Approach*, (2nd ed). FT Prentice Hall.
4. Oz, E. (2008). *Management Information Systems*, (6th ed). Course Technology.

Proposed Course Facilitator(s)

1. Associate Professor Gilbert Maiga

Information Systems Audit

Course Name:	Information Systems Audit
Course Code:	IST 3204
Course Level:	Year 3 Sem 2
Contact Hours:	45
Credit Units:	3 CUs
Pre-requisite Courses:	BIT 2208 Systems Administration, BIS 2106 Data and Information Management II, BIS 2105 Information Systems Security and Risk Management

Course Description:

This course seeks to explore how enterprise-wide IT resources can be secured, managed, and leveraged through appropriate IT governance and internal controls. The most effective way to mitigate IT-associated risks is to design and implement IT audit and control mechanism with a risk management approach. IT must be systematically organized and monitored as a resource with carefully designed and executed IT policies to maximize its impacts. After all, firms in the digital economy leverage IT to gain a competitive advantage.

Course Objectives:

The objectives of this course are:

1. To enable students to comprehend general audit, information systems audit and control, IT governance and their applications to the business environment.
2. To enhance students' competency towards risk management, information systems audit, assurance, business continuity planning, disaster recovery planning, and internal control.
3. To develop students' critical understanding of Computer Assisted Audit Tools and Techniques (CAATTs) and its business applications for data extraction and analysis.
4. To gain insight into computer-assisted fraud and fraud detection techniques for business asset protection

Course Learning Outcomes:

By the end of this course, students should be able to:

1. Articulate the concepts of auditing and information systems audit and control.
2. Apply the IS audit methodology and formulate information security policy.

3. Evaluate the organization's IT governance, risk management, IS control and security architecture, business continuity plan, disaster recovery plan, and propose solutions in addressing related issues.
4. Develop knowledge and skills in the application of various types of computer-assisted audit tools and techniques.

Indicative Content:

1. Fundamentals of IS Audit and Control	6 hours
2. IS Audit Process	6 hours
3. IS Audit Management	6 hours
4. IS Governance	6 hours
5. Protection of Information Assets	6 hours
6. Business Continuity and Disaster Recovery	6 hours
7. Computer Assisted Audit Tools and Technologies (CAATT)	9 hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of delivery

1. Lecture
2. Online learning management systems
3. Class discussions and presentations
4. Group project-based assignments

Mode of Assessment:

- | | |
|---|-----|
| 1. Course work (Tests, practical exercises) | 20% |
| 2. Take home assignment | 20% |
| 3. Final written exam: | 60% |

Reading List:

1. Cascarino, R. E. (2012). *Auditor's Guide to IT Auditing + Software Demo* (Vol. 583). John Wiley & Sons.
2. Hall, J. A. (2010). *Information Technology Auditing*. Cengage Learning.
3. Johnstone, K., Gramling, A., & Rittenberg, L. E. (2013). *Auditing: A Risk-Based Approach to Conducting a Quality Audit*. Cengage Learning.
4. Moeller, R. R. (2010). *IT audit, control, and security* (Vol. 13). John Wiley & Sons.
5. Senft, S., & Gallegos, F. (2008). *Information technology control and audit*. CRC Press

Proposed Course Facilitator(s)

1. Dr. Aminah Zawedde

2. Ms. Fiona Ssozi-Mugarura

Modelling and Simulation

Course Name: Modelling and Simulation
Course Code: IST 3208
Course Level: Year 3 Sem 2
Contact Hours: 45
Credit Units: 3 CUs
Pre-requisite Courses: None

Course Description:

This course provides an introduction to system modeling using both computer simulation and mathematical techniques. A range of case studies are examined in the lectures and project exercises. Students will get hands-on training. The application areas considered are wide-ranging, although the emphasis is on the analysis of a variety of modeling paradigms such as queuing and dynamic systems. A simulation language will be utilized and an applied project carried out.

Course Objectives:

The aims of this course are to help students to:

1. Acquire basic knowledge about simulation and modeling
2. Develop critical thinking and analytical skills
3. Attain skills of building simulation models and learn how to model and simulate a variety of management-related problems.
4. To be able to solve real world problems which cannot be solved strictly by mathematical approaches using Modeling and Simulation.

Course Learning Outcomes:

By the end of the course students should be able to:

1. Demonstrate basic knowledge about simulation and modeling
2. Exhibit critical thinking and analytical skills
3. Display skills of building simulation models and how to model and simulate a variety of management-related problems.
4. Manifest competence in solving real world problems which cannot be solved strictly by mathematical approaches using Modeling and Simulation.

Indicative Content:

1. Introduction to simulation concepts : simulation, models, benefits of using simulation, application areas, model classifications, types of simulations, benefits and drawbacks of simulation, Pitfalls to successful completion of simulations.	3 Hours
2. Introduction to systems- static and dynamic; discrete and continuous, Introduction to Monte Carlo simulation, generation of	6 Hours

random numbers using Excel RAND () as well as various distributions such as, Bernoulli, Exponential.	
3. Discrete Event Simulation (DES): components of DES, overview of Queuing Theory, queuing systems, queuing models, queuing discipline (LIFO, FIFO, SIRO, priority queue), analysis and performance measures of queuing systems, overview of probability distributions (such as Markovian, deterministic) used in queuing models.	6 Hours
4. Hand simulation exercises employing single/multi-channel, single/multi-phase server systems	6 Hours
5. Simulation Development Life Cycle: problem formulation, system investigation, model formulation, model representation, programming, design of experiments, experimentation, presentation of simulation results, verification and validation.	6 Hours
6. Graphical Integration: basic principles and application of graphical integration, constant rates, inflows and outflows, step functions.	6 Hours
7. Introduction to dynamic simulation models: Stock and Flow diagrams, STELLA modeling environment. Exercises involving modeling with STELLA, interpretation of graphs, creating user interfaces and them to the models.	6 Hours
8. Undertake DES and dynamic simulation field projects.	6 Hours
TOTAL HOURS	45 HOURS

Study Materials

Text books, conference and journal publications, and online resources.

Mode of Delivery:

1. Lectures
2. Lab practicals
3. Online learning management systems
4. Class discussions and presentations
5. Group project-based assignments

Mode of Assessment:

- | | |
|-------------------------------------|-----|
| 1. Course work (tests, assignments) | 20% |
| 2. Projects | 20% |
| 3. Final written exam: | 60% |

Reading List:

1. Sokolowski, J.A. & Banks, C.M. (2011). *Principles of Modeling and Simulation: A Multidisciplinary Approach*. John Wiley & Sons. ISBN: 978-0-470-28943-3.
2. Sokolowski, J.A. & Banks, C.M. (2010). *Modeling and Simulation Fundamentals: Theoretical Underpinnings and Practical Domains*. John Wiley & Sons. ISBN: 978-0-470-48674-0.

3. Zeigler, B.P., Praehofer, H., & Kim, T.G. (2000). *Theory of Modeling and Simulation*, (2nd ed).
4. Law, A.M & Kelton, W.D. (2000). *Simulation Modeling and Analysis*, (3rd ed).
5. Kelton, W.D., Sadowski, R.P., & Sturrock, D.T. (2006). *Simulation With Arena*, (4th ed), Mc-Graw Hill

Proposed Course Facilitator(s)

1. Dr. Fiona Tulinayo
2. Dr. Agnes Rwashana Semwanga
3. Dr. Aminah Zawedde
4. Dr. Paul Mukasa Ssemaluulu

11. Quality Assurance

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

- a) Measure the extent to which the required skills have been achieved
- b) Ascertain the implementation of the proposed methodological changes
- c) Create feedback 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.

11.1. Feedback from Students

In the current setup, each class has at least one student representative. These representatives are in constant contact with the Heads of Departments as a feedback mechanism. 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.

The School of Computing and Informatics Technology has a computerized system that captures and analyzes data collected from the students through which:

- a) All students are required to evaluate their lectures using online tools.
- b) The evaluation data can be analyzed quickly in order to obtain timely feedback.
- c) Data is easily archived and therefore trends in staff performance are easy to determine.

11.2. Class Meetings

The School management organizes at least two meetings with every Program during each academic year. During these meetings, general quality issues are addressed. Students are also given a chance to raise any concerns that need to be addressed by the School management.

11.3. Use of ICT in Availing Lecture Materials

Currently, Makerere University uses Makerere University E-Learning Environment (MUELE) as the platform through which courses are delivered. MUELE is can be accessed at <http://muele.mak.ac.ug>.

Students at the School of Computing and IT have adequate access to computers and Internet connectivity, which creates conducive environments for blended learning. Staff will, as much as possible; make use of e-learning facilities to administer their courses.

11.4. Peer Review

Course leaders and other members of staff in the department will have access to all courses taught at the School. Course Leaders (who will normally be senior staff) will take the lead in developing content and presentation materials for the courses taught.

11.5. External Review

The BIST Program will be externally reviewed every academic year by senior academics across the region. This will include a review of course curricula; student examinations and performance (across all courses in the BIST Program) in order to monitor for quality. The senior academics would be required to present reports whose recommendations are discussed in order to establish necessary improvements in the BIST Program.

Appendix 1: Staff List

No.	Name	Qualifications and Awarding Institution	Area of Specialization	Teaching Load (hours)	Status
1.	Assoc. Prof. Patrick Job Ogao	PhD. GEO Visualisation (UU ¹), MSc. GEO Visualisation (Twente), Bsc. Surveying (UON)	<ul style="list-style-type: none"> • GIS and remote sensing • Visualization 	10	Full time
2.	Assoc. Prof. Gilbert Maiga	PhD. IS (Mak), MSc. CS (Mak), and BVM (Mak).	<ul style="list-style-type: none"> • Information Systems Evaluation and Eservices 	6	Full time
3.	Dr. Josephine Nabukenya	PhD. IS (RUN ²), MIS (Mak), and BLIS (Mak).	<ul style="list-style-type: none"> • Business Process Modelling 	10	Full time
4.	Dr. Peter Nabende	PhD. Mathematics and Natural Sciences (RUG ³), MSc. CS (Mak), BSc. Mech Eng (Mak).	<ul style="list-style-type: none"> • Intelligent Systems • Data Mining • Computational Linguistics 	11	Full time
5.	Dr. Mercy Amiyo	PhD. IS (RUG ³), MSc. Internet & Database Systems (LSBU ⁴), BSc. CS (Mak).	<ul style="list-style-type: none"> • Business Process Management • Health/Medical Informatics 	12	Full time
6.	Dr. Rehema Baguma	PhD. IS (RUNError! Bookmark not defined.), MSc Computer Application Technology (Huazhong University), PGD Cs (Mak) and BSc Lib & IS (Mak)	<ul style="list-style-type: none"> • Human Computer Interaction , E-services, Usability Evaluation • ICT for Development 	10	Full time
7.	Dr. Emily Bagarukayo	PhD. IS (RUNError! Bookmark not defined.) P.G.D Educational Technologies (UCT ⁵), MSc.CS (Mak), and BCS (MUST).	<ul style="list-style-type: none"> • Learning and Educational Technologies • eService delivery 	11	Full time
8.	Dr. Agnes Nakakawa	PhD. IS (RUNError! Bookmark not defined.), MSc.CS (Mak), and B. Stat. (Mak).	<ul style="list-style-type: none"> • Enterprise Architecture Development. • Collaborative Decision Making 	10	Full time

¹ University of Utrecht

² Radboud University Nijmegen

³ University of Groningen

⁴ London South Bank University

⁵ University of Cape Town

9.	Dr. Aminah Zawedde	PhD. SE (TUE ⁶), MSc. CS (Mak), P.G.D Educ. Techn, (UCT Error! Bookmark not defined.), BSc. Stat(Mak), G.D Ed.	<ul style="list-style-type: none"> • System Dynamics and Modelling, • Requirements Engineering 	6	Full time
10.	Dr. Agnes Rwashana Ssemwanga	PhD. CS (Mak), MSc.CS (Mak), and BSc/Educ. (Mak).	<ul style="list-style-type: none"> • System Dynamics and Modelling. 	3	Full time
11.	Dr. Evelyn Kigozi Kahiigi	PhD. Computer and System Sciences (Stockholm University), MSc CS(Mak), and BSC Elec Eng (Newport, UK)	<ul style="list-style-type: none"> • E-learning, ICT4D • Health Informatics 	11	Full time
12.	Dr. Fiona Tulinayo	PhD. IS (RUN Error! Bookmark not defined.), MSc. CS (Mak), and BFA (Mak).	<ul style="list-style-type: none"> • System Dynamics 	11	Full time
13.	Dr. Florence Nameere Kivunike	PhD. Computer and System Sciences (Stockholm University), MSc CS(Mak), and BSc Elec Eng (Mak)	<ul style="list-style-type: none"> • Eservice delivery • Web systems development 	10	Full time
14.	Dr. Raymond Mugwanya	PGD Education (UCT Error! Bookmark not defined.) PhD. Computer Science (UCT Error! Bookmark not defined.), MSc Computing (Liverpool), and BSc Statistics (Mak).	<ul style="list-style-type: none"> • Learning Analytics • ICT4D, Usability of Software Systems, Mobile HCI 	11	Full time
15.	Dr. Paul Ssemaluulu Mukasa	PhD. IS (RUG ³), MSc. CS (Mak), and BBA (Mak).	<ul style="list-style-type: none"> • Information Systems Evaluation • Modelling and Simulation 	10	Contract
16.	Dr. Daudi Jjingo	PhD. Bioinformatics (Georgia USA), MSc Bioinformatics (Leeds UK), and BSc Biochemistry (Mak UG).	<ul style="list-style-type: none"> • Bioinformatics of Infectious and Chronic Diseases • Health Informatics 	10	Full time
17.	Dr. Peter Khisa Wakholi	PhD (Bergen), MSc. Internet and Database Systems (LSBU Error! Bookmark not defined.), and BSc. CS (Mak).	<ul style="list-style-type: none"> • System dynamics & modeling • Software development 	10	Full time

⁶ Eindhoven University of Technology

18.	Dr. Johnson Mwebaze	PhD. CS (RUG ³), MSc CS (Mak), PGD CS (Mak) and BSc Mathematics (Mak)	<ul style="list-style-type: none"> • Big Data Analysis • Data Communication Networks 	10	Full time
19.	Dr. Ernest Mwebaze	PhD. CS (Groningen), MSc. CS (Mak), and BSc Electrical Engineering (Mak)	<ul style="list-style-type: none"> • Artificial Intelligence • Data Science 	10	Full time
20.	Hasifah Namatovu Kasujja	MSc IS (Mak), and Business Computing (Mak)	<ul style="list-style-type: none"> • Information Systems 	6	Full time
21.	Fiona Ssozi Catherine	MSc ISM (LSBU Error! Bookmark not defined.), and BIT (Mak)	<ul style="list-style-type: none"> • Information Systems 	PhD study Leave	Full time
22.	Richard Mayanja	MSc Cs (Mak), and BLIS (Mak)	<ul style="list-style-type: none"> • Information Systems 	10	Full time
23.	Grace Kobusinge	MSc IT (Mak), and BSc CS (MUST)	<ul style="list-style-type: none"> • Information Systems 	PhD study Leave	Full time
24.	Mark Magumba	MSc IS (SHU ⁷), and BIT (Mak)	<ul style="list-style-type: none"> • Information Systems 	6	Full time
25.	Jacob Katende	MSc MIS (Mak), and BIT (Mak)	<ul style="list-style-type: none"> • Big Data Computational Linguistics. 	12	Full time
26.	Asio Evelyn Kalenzi	MSc IT(KSIST ⁸), and BIT (Mak)	<ul style="list-style-type: none"> • Information Systems 	MSc study Leave	Full time
27.	Irene Arinaitwe	MSc IT (Mak), and BIT (Mak)	<ul style="list-style-type: none"> • Information Systems 	6	Full time
28.	Esther Namirembe	MSc Cs (Mak), and BSc Cs (Mak)	<ul style="list-style-type: none"> • Information Technology 	PhD study Leave	Full time
29.	Halim Chongomweru	MSc NW (Malaysia), and BSc Cs (IUIU)	<ul style="list-style-type: none"> • Information Technology 	12	Full time
30.	Alice Mugisha	MSc Cs (Mak), and BSeduc (Mak)	<ul style="list-style-type: none"> • Information Technology 	PhD study Leave	Full time
31.	Margaret Nagwovuma	MSc IT (Mak), and BIT (IUIU)	<ul style="list-style-type: none"> • Information Technology 	6	Full time
32.	Flavia Namagembe	MSc IS (Mak), and BIT (Mak)	<ul style="list-style-type: none"> • Information Technology 	12	Full time
33.	Henry Serugunda	MSc MIS (Mak), and BIT (Mak)	<ul style="list-style-type: none"> • Information Technology 	10	Full time
34.	Innocent Ndibatya	MSc CS (Mak), and BIT (Mak)	<ul style="list-style-type: none"> • Information Technology 	PhD study Leave	Full time
35.	Hawa Nyende	MIT (Mak), and Bsc (Mak)	<ul style="list-style-type: none"> • Information Technology 	PhD study Leave	Full time
36.	Emmanuel Mugejjera	MIT (Mak), and BIT (Mak)	<ul style="list-style-type: none"> • Information Technology 	6	Full time

⁷ Sheffield Hallam University

⁸ Kurdish Society for Information Science & Technology

37.	Davis Rwabu	MA Mak	<ul style="list-style-type: none"> • Computer Science 	-	Part time
38.	Dr. Joyce Nakatumba-Nabende	PhD. IS (RUNError! Bookmark not defined.), MSc.CS (Mak), and B. Stat. (Mak).	<ul style="list-style-type: none"> • Computer Science 	12	Fulltime
39.	Lillian Komugisha	MSc Mak, BSc Mak	<ul style="list-style-type: none"> • Information Technology 	6	Fulltime
40.	Jonathan Kizito	MSc Mak, BSc Mak	<ul style="list-style-type: none"> • Computer Science 	12	Fulltime
41.	Dr. Drake Mirembe	PhD. IS (Groningen), MSc Cs (Radboud University), and BSc Cs (Mak)	<ul style="list-style-type: none"> • ICT4D, IS Security & digital Forensics • Wireless & Mobile Technologies, 	12	Full time
42.	Dr. Richard Ssekibuule	PhD. IS (RUNError! Bookmark not defined.), MSc.CS (Mak), and B. Stat. (Mak).	<ul style="list-style-type: none"> • Computer Science 	6	Fulltime

Appendix 2: Budget for BIST Program

Item	Activity/Item	Resource/Items	Rate	Units	Amount (UGX)
2	Teaching costs	(Extra load only) 50 CU x 28 weeks in a year (Evening Program)	100,000	1400	140,000,000
		Teaching software licenses	500(USD)	20 SW Licences	36,000,000
		Supervising and examining Projects (1 group has 4 students)	700000	50	35,000,000
		Student support (s (36 Practical course units x 2 practical hours x 28 weeks))	50,000	2016	100,800,000
		Lab attendants (3 Labs need 2 attendants @ at a rate 500000/month	200,000 UGX	6 x 12	14,400,000
	Teaching equipment	Lab equipment maintenance (5% of the equipment cost) (1 computer / student => 200 computers for 200 students where @ year is 200 students)	50 (USD) (x 3600 UGX)	200 computers	36,000,000
		Replacement of Projectors	1500 (USD) (x 3600 UGX)	1	5,400,000
		Replacement of Computers for staff and students– 50 computers replaced every year	1000 (USD) (x 3600 UGX)	50 computers	180,000,000
		Whiteboards (Each class needs 2 white boards => 2 classes = 2whiteboards)	40 (USD) (x 3600 UGX)	2	288,000
3	Stationery & communication	Printing paper (5 rims per staff for 40 staff per year)	18,000 UGX	200rims (5x40 rims)	3,600,000
		Printing toner (12 cartridges per year)	300,000 UGX	12 cartridges	3,600,000
		Marking pens (8 per staff per year) @ pen at 500 UGX	500 UGX	8x40 pens	160,000
		Other pens (8 per staff per year) @ pen at 500 UGX	500 UGX	8x40 pens	160,000
		Counter books (2 per staff per year)	10,000 UGX	2 x 40 books	800,000
		Box files (4 per staff per year)	5,000 UGX	4x40	800,000

		Paper files (40 per staff per year)	500 UGX	40x40	800,000
		Whiteboard markers (12 markers per staff per year)	3,000 UGX	12x40	1,440,000
		Whiteboard dusters (2 dusters per staff per year)	20,000 UGX	2 x 40	1,600,000
		Airtime (2 Chairs)	100,000 UGX per month	2x12	2,400,000
		Coordination Costs	200,000	96	19,200,000
		e-books and ICTs	1,000,000	12	12,000,000
		LMS maintenance and support	300,000 UGX	12	3,600,000
4	Office	Replacement of chairs (10 chairs per year)	500,000	10	5,000,000
		Replacement of printers (1 printer per 2 years)	10,000,000	2	20,000,000
		Cleaning materials	10,000,000	1	10,000,000
GRAND TOTAL					633,048,000
Cost Per Year Per based on 200 Expected Students					3,165,240
Cost Per Sem Per Student					1,582,620