INFORMATION & COMMUNICATIONS TECHNOLOGY
PAPER 7

OVERALL AIM

To equip the learner to apply knowledge and skills acquired in information communication technology to provide solutions in a business environment.

LEARNING OUTCOMES

On completion of this course, the learner should be able to:

	Learning outcome	K	C	A	An	E	S
1.	Describe information technology in a business context		✓				
2.	Discuss the systems development process and the associated challenges		✓				
3.	Identify specification and selection of computer hardware and software solutions for business	✓					
4.	Discuss the adequacy of general information technology and application controls		✓				
5.	Discuss the benefits and challenges associated with the use of ICT		✓				
6.	Discuss the advantages and disadvantages of using electronic media in business		✓				
7.	Explain security, regulatory, policy and ethical issues associated with the use of ICT	✓					
8.	Prepare numerical, text, graphical and database information using a computer			✓			

LEVEL OF ASSESSMENT

The examination will test the learner's knowledge, comprehension and application of skills in ICT to business.

EXAMINATION STRUCTURE

There will be a three-hour theory examination made up of sections A and B. Section A will comprise 20 compulsory multiple-choice questions of 20 marks. Section B will comprise five questions of 20 marks each, of which the candidate will be required to attempt any four. There will also be a one-hour thirty minutes hands-on examination of 50 marks.

DETAILED SYLLABUS (THEORY)

A INTRODUCTION

1. Importance of information technology in supporting business
2. Computer system:
   - (a) Computer and computer system
   - (b) Components of a computer system
   - (c) System environment boundary: Input, process, output
   - (d) Types of data/ information processing
   - (e) Care and security of computer systems:
     - (i) Computer systems security
     - (ii) Computer viruses (meaning and characteristics)
     - (iii) Software and data security
     - (iv) Dangers to computer software and information systems
     - (v) Precautions and safeguards against data/ file loss
     - (vi) Antivirus software: Meaning, characteristics, types

(f) Management of computer systems

(g) Data and information: Distinction, characteristics, data processing cycle, value of information

(h) Modes of data processing (real-time/ online, batch, distributed, centralised)

(i) Attributes of good information

(j) Ergonomics (physical health and mental health)

3. Information Technology:
   (a) Manual versus computerized systems
   (b) Limitations of using computers
   (c) Applications
   (d) Social impact of computers and information technology

B COMPUTER HARDWARE AND SOFTWARE

1. Computer hardware, including maintenance of hardware devices
2. Computer software, including the applicability of computer software to businesses

C DATA COMMUNICATION AND COMPUTER NETWORKS

1. Data transmission:
   (a) Data communication for business, including principles and devices
   (b) Transmission and control of business data, including transmission characteristics
   (c) Components of data communication
   (d) Data management and security
2. Wired and wireless communication channels
3. Computer networks, including types, characteristics, benefits and challenges
4. Network topologies, including types and characteristics
5. Network models, including characteristics and applications of client-server and peer-to-peer systems
6. Big Data

7. Cloud computing
8. Internet of things (IoT):
   (a) Technologies including real-time analytics, machine learning, commodity sensors, embedded systems and other emerging technologies
   (b) Applications
   (c) Enabling technologies: Addressability, application layer, standards and standards organisations
   (d) Challenges and adoption barriers
   (e) Government regulation

D COMPUTER-BASED INFORMATION SYSTEMS

1. Nature, types, components and characteristics of information systems
2. Office automation systems
3. Benefits and limitations of computer-based information systems
4. Transaction processing, decision support, management information and executive support systems
5. Application of information systems in functional areas such as sales, marketing, manufacturing and production, finance and accounting and human resource management
6. Information systems as a tool for business strategy
7. Challenges posed by strategic information systems and possible solutions

E INFORMATION SYSTEMS DEVELOPMENT

1. The traditional systems development life cycle, including the stages and activities involved and tools used
2. Stakeholders to system development, including their roles
3. Alternatives to the traditional systems development life cycle, including prototyping and rapid application development (RAD), joint application design (JAD), participatory design (PD) and agile methodologies

4. Systems development and management considerations
5. Organisational change considerations
6. Challenges of building and using information systems and possible solutions

F E-GOVERNANCE

1. E-government and e-governance
2. Types of interactions in e-governance:
   (a) Government-to-business (G2B)
   (b) Government-to-citizen (G2C)
   (c) Government-to-employees (G2E)
   (d) Government-to-government (G2G)
3. E-governance models
4. Information communication technology (ICT) governance framework, including the tools used and compliance with the framework
5. Role of ICT in governance
6. Phases of e-governance
7. E-governance in Uganda, including the role of National Information Technology Authority Uganda and Uganda Communications Commission; e-services and benefits of e-governance
8. Challenges of e-governance

G ELECTRONIC COMMERCE (E-COMMERCE)

1. Concepts and features
2. Modes of e-commerce:
   (a) Business-to-business (B2B)
   (b) Business-to-consumer (B2C)
   (c) Mobile commerce (m-commerce)
   (d) Facebook commerce (f-commerce)
   (e) Consumer-to-consumer (C2C)

(f) Consumer-to-business (C2B)

(g) Business-to-administration (B2A)

3. Marketing on the internet, including methods, e-marketplaces (including components and types as well as considerations for setting up an e-marketplace)
4. Security in e-commerce, including dimensions as well as types and causes of threats and measures to mitigate the threats
5. Ethical and legal issues
6. E-transactions

H ARTIFICIAL INTELLIGENCE

1. Importance, application and challenges of artificial intelligence

I INFORMATION SYSTEMS RISK AND SECURITY MANAGEMENT

1. Introduction:
   (a) Risk and risk management
   (b) Types of risks
   (c) Business value of security and controls
   (d) Need for special protection from destruction, error and abuse of information systems
   (e) Organisational and managerial frameworks for security and control
   (f) Risk assessment and evaluation as well as risk management strategies
2. Importance of risk management; integration of risk management into the systems development life cycle
3. Risk assessment steps, including system characterisation, threat identification, vulnerability identification, control analysis, livelihood determination, impact analysis, risk determination, control recommendations, results documentation

4. Risk mitigation and risk mitigation options, including risk assumption, risk avoidance, risk limitation, risk planning, research and acknowledgement and risk transfer
5. Security controls:
   (a) Technological security controls, management security controls, operational security controls
   (b) Approaches to control implementation
   (c) Quality control and quality assurance
   (d) Tools and technologies for safeguarding information resources
   (e) Challenges posed by information systems security and control and solutions to the challenges
6. Computer virus risks and mitigation measures
7. Residual risk
8. Cyber security, including data breaches, cyber risk management framework and controls to detect, prevent or mitigate cyber-based risks
9. Cloud based services and controls

DETAILED SYLLABUS (HANDS-ON)

A SPREADSHEETS

1. Introduction to spreadsheets, including commonly used spreadsheet programs
2. Standard features of spreadsheets
3. Microsoft Office Excel (Excel)
   (a) Using Excel:
      (i) Starting Excel
      (ii) Excel working environment
      (iii) Using the ribbon as the Excel user interface
      (iv) Navigating within the worksheet/ workbook
      (v) Selecting a cell or range of cells
      (vi) Entering data

(vii) Cutting, copying and pasting cell values
(viii) Copy and paste special
(ix) Saving and opening a workbook

(b) Managing rows and columns:
(i) Inserting, moving and deleting cells
(ii) Managing columns and rows
(iii) Hiding and unhiding rows/ columns
(iv) Formatting column widths and row heights

(c) Managing worksheets:
(i) Formatting worksheet tabs
(ii) Inserting and deleting worksheets
(iii) Moving and copying worksheets
(iv) Hiding and unhiding worksheets

(d) Formatting:
(i) Formatting cells
(ii) Formatting text and data
(iii) Number and date formatting
(iv) Merging cells, columns and rows
(v) Text wrapping
(vi) Formatting column width and row height
(vii) Finding and replacing text
(viii) Formatting using cell styles

(e) Formulas and functions:
(i) Entering formulas
(ii) Arithmetic operators and order of operations
(iii) Auto-fill options
(iv) Commonly used functions: VLOOKUP, HLOOKUP, SUM, IF, MAX and MIN, SUMIF, COUNTIF, AND, OR, Left, Right and Concatenate, Round, Proper, Now, Rank, Financial functions

(f) Worksheet and table data:
  (i) Creating and modifying tables
  (ii) Sorting and filtering data in tables
  (iii) Summarising table information
  (iv) Search and replace
  (v) Preparing output
(g) Charts:
  (i) Column charts
  (ii) Bar charts
  (iii) Line charts
  (iv) Scatter charts
  (v) Pie (doughnut) charts
(h) Workbooks:
  (i) Linking worksheets
  (ii) Print areas; printing worksheets
  (iii) Page setup options
  (iv) Setting page breaks

B WORD PROCESSING

1. Introduction to word processing, including commonly used word processing programs
2. Contents and uses of features of word processing programs
3. Using the Word Application:
   (a) Saving document to a location on a drive, under another name and in another file type such as Text file, Rich text format, Hypertext Markup Language (HTML), Template, Software specific file extension and Version number
   (b) Switching between open documents
   (c) Using available help functions
   (d) Closing a document
   (e) Adjusting settings
   (f) Changing between page view modes

(g) Using magnification/ zoom tools

(h) Displaying/ hiding built-in toolbars

(i) Displaying/ hiding non-printing characters

(j) Modifying basic options/ preferences in the Application, including user name, default directory/ folder to open, save documents

4. Main operations:

(a) Inserting and deleting text

(b) Paragraphing

(c) Using the keyboard to navigate around a document

(d) Inserting special characters and symbols

(e) Selecting data, character, word, line, sentence, paragraph and entire body text

(f) Using the 'undo' and 'redo' commands

(g) Duplicating, moving, deleting a file

(h) Duplicating text within a document and between open documents

(i) Editing content, including inserting new characters, words within existing text, overwriting text

(j) Searching and replacing

(k) Using a simple 'replace' command for a specific word or phrase

5. Document formatting:

(a) Inserting and removing paragraph marks

(b) Inserting and removing soft carriage return/ line break marks

(c) Aligning text to the left, centre, right and justified

(d) Setting paragraph alignment

(e) Setting alignment in styles

(f) Indenting paragraphs to the left, right, first line or hanging

(g) Line spacing: Single, double and line spacing within paragraphs

(h) Applying spacing above and/ or below paragraphs

(i) Setting, removing and using tabs: Left, centre, right and decimal

(j) Applying bullets:

(i) Numbers to a single level list

(ii) Removing bullets/ numbers from a single level list

(iii) Bulleting an existing list/ quick method

(iv) Bulleting an existing list using 'Format'

(v) Creating a new bullet list

(vi) Turning off bullets

(vii) Creating a numbered list

(k) Borders and shading

6. Tables:

(a) Creating a table

(b) Inserting and editing data in a table

(c) Selecting cells, rows, columns and entire table

(d) Inserting/ deleting rows and columns

(e) Modifying column width and row height

(f) Modifying cell border width, style and colour

(g) Setting borders of individual cells/ blocks of cells

(h) Adding shading to cells

(i) Adding a shadow on the table

(j) Other important table functions

7. Pictures, images and charts:

(a) Inserting picture or image or chart into a document

(b) Selecting picture, image or chart in a document

(c) Duplicating picture, image or chart within a document

(d) Resizing a picture, image or chart within a document

(e) Deleting a picture, image, chart within a document

8. Mail merging:

(a) Starting 'mail merge'

(b) Identifying the main document
(c) Creating a recipient list
(d) Customising columns in a recipient list
(e) Rearranging columns in a recipient list
(f) Saving a recipient list
(g) Entering records into a recipient list
(h) Sorting records to be merged
(i) Highlighting merge fields
(j) Inserting merge fields into a document
(k) Previewing merged data
(l) 'If-Then-Else'rule
(m) Merging to a new document
(n) Merging to a printer

9. Output:
   (a) Document proofing: Checking layout, presentation and spelling
   (b) Spell-check
   (c) Using Thesaurus

C PRESENTATION SOFTWARE

1. Key features of and commonly used presentation software
2. Contents and uses of features of presentation software
3. Preparing a presentation
4. Exploring the 'PowerPoint' Application
5. Developing and working with presentations
6. Slides
7. Designing templates
8. Editing and proofing text
9. Formatting presentation text
10. Formatting bullets and numbers
11. Working with tables
12. Using graphic images

13. Using SmartArt
14. Master slide
15. Working with drawn objects and pictures
16. Text and images
17. Charts and graphs
18. Adding special effects
19. Duplicating, moving and deleting slides
20. Using page setup: Change slide setup, slide orientation to portrait and/or landscape
21. Using slide show view
22. Preparing output
23. Notes, outlines, page name
24. Handouts
25. Delivering a presentation.

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