



Grade 11 Information Technology Course Outline



September (2024) -April (2025)

IMPORTANT DATES

1. Christmas Midterm: **October 21 - 23**
2. 1st Sixth week test: **October 14 - 18**
3. 2nd Sixth week test: **December 9 – 13**
4. Prize Giving: **December 18**
5. Mock Exam February 17 - March 4

Department Name:	Computer Studies
Grade Level:	10
Title of Course:	Grade 11 Information Technology
Duration:	September 4 (2024) - April (2025)
Description of the Course:	<p>The Grade 11 Information Technology course is designed to prepare students for the Information Technology CSEC external examinations. Each topic is directly aligned with the CSEC Information Technology 2020 Syllabus. There is a focus on both practical and theory topics.</p> <p><u>Practical topics</u> to be covered at this level include:</p> <ul style="list-style-type: none"> • Problem Solving and Program Design • Program Implementation <p>Students will also complete the School Based Assessment (SBAs) for the practical area stated above as well.</p> <ul style="list-style-type: none"> • Term 1(Pseudocode) • Term 2(Pascal Program & Trace Table) • <u>Theory Topics</u> to be covered at this level include:

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	<ul style="list-style-type: none">• Social and economic impact of information and Communications technology (ICT) <p>There will be a total of three (3) teaching sessions for each week:</p> <ul style="list-style-type: none">• Double Sessions: Practical• Single Sessions: Theory
<p>Course Objective: <i>(General Objectives)</i></p>	<p><i>Upon Completion of this course, students should be able to:</i></p> <p>PROBLEM-SOLVING AND PROGRAM DESIGN</p> <ul style="list-style-type: none">• develop the cognitive skills to solve problems; and,• develop competence in applying a structured approach to solving problems on the computer. <p><i>Upon Completion of this course, students should develop an awareness of:</i></p> <p>PROGRAM IMPLEMENTATION</p> <ul style="list-style-type: none">• know how to translate an algorithm into a high-level program• understand how to employ techniques to successfully execute a program. <p><i>Upon Completion of this course, students should be able to:</i></p> <p>SOCIAL AND ECONOMIC IMPACT OF INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)</p> <ul style="list-style-type: none">• develop an understanding of the various elements of computer security, and data misuse and the impact on individuals and organizations• maintain safe and secure computing environments• assess the impact of technological advancements on different fields, disciplines and jobs
<p>Student Learning Outcomes: <i>(Specific Objectives)</i></p>	<p>Students will be able to:</p> <p>PROBLEM-SOLVING AND PROGRAM DESIGN</p> <ul style="list-style-type: none">• outline the steps in problem-solving• use the divide-and-conquer approach to decompose large everyday problems into smaller tasks• define a problem by decomposing it into its significant components• distinguish between variables and constants

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- explain the concept of algorithms
- represent algorithms in the form of flowchart and pseudocode
- test algorithms for correctness

PROGRAM IMPLEMENTATION

- distinguish between low-level and high-level programming languages
- describe the sequence of steps in implementing a program
- perform checks and tests on programs to verify correctness
- declare variables and constants using elementary data types
- translate algorithmic statements into high-level language syntax and effectively document programs

SOCIAL AND ECONOMIC IMPACT OF INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

- outline the concepts of computer security, cybersecurity and computer misuses
- assess the potential impact of computer systems misuse based on the main entities impacted
- describe suitable countermeasures to mitigate effects of identified threats
- assess the effect of automation on job security
- describe the roles of various personnel in computer-related professions
- assess the impact of information and communications technology on select fields

SPREADSHEETS

- explain the purpose of a spreadsheet
- use appropriate terminologies commonly associated with spreadsheets
- manipulate columns and rows
- manipulate data in a spreadsheet
- use basic pre-defined systems functions
- create advanced arithmetic formulae
- replicate (copy) formulae into other cells
- perform charting operations
- Manipulate *one or more* worksheets

Topical Outline of the Course Content:

PROBLEM-SOLVING AND PROGRAM DESIGN

- Steps in problem-solving:
- Basic treatment of the structured approach for solving complex problems

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- The components are: input; process; and output. A defining diagram (IPO Chart) may be used to delineate the components
- Variables as an area of storage whose value can change during processing; the value of a constant never changes
- Data types: integers, floating point (real), characters, Boolean, string
- Definition of algorithms
- Characteristics: finite number of steps, precise, unambiguous, flow of control from one process to another, terminate
- Use of flowchart symbols: input/output, process, decision, directional arrows, start/stop
- Pseudocode – Use of read, input, store, write, print, output, display, conditional branching (if-then, if-then-else, nested conditions); loops (for, while, repeat).
- Use of relational operators: <, >, =, <=, >=, < >. Logical operators: AND, OR, NOT; use of truth tables
- Arithmetic operators: +, -, *, /, MOD, DIV.
- Desk checks/dry run: construction and use of trace tables to verify results. Trace tables consist of variable names (identifiers) as column headings and values in the cells, one row for each pass

PROGRAM IMPLEMENTATION

- Low-level language (Machine or Assembly).
- High-level language (*For example*, Visual
- Steps in implementing a program
- Errors: syntax, logic, runtime.
- Testing (test data).
- Debugging techniques
- Data types: integer, real/double/float, character, string and Boolean/logical
- Assignment statements: input/output operations using standard input/output (reading data entered via keyboard, displaying data on monitor).
- Syntax for arithmetic, logic and relational operators.
- Syntax for conditional branching (for example, if-then, if-then-else, nested if-then else or case)
- Syntax for Iteration (Loops): for, while & repeat
- Importance of documentation
- Features of internal documentation (use of mnemonic, variable names, use of comments, indentation, effective use of white space)
- Features of external documentation (user manual).

Basic, Pascal, C).

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SOCIAL AND ECONOMIC IMPACT OF INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

- Computer security and cybersecurity as related to the assessment and minimization of risk. (Elements: vulnerability, threat, attack, countermeasure.
- Computer misuse by individuals and groups/organizations.
- Physical security measure, software security measures, personal security measures
- Job loss vs productivity gains in skilled and unskilled job categories.
- Careers in IT (Network Engineer, Computer, Programmer, Computer Support, Specialist, Computer Systems Analyst, Administrators (Network, Systems and, Database), Software Developer, Web, Developer, Social Media Specialist)
- Economic implications of ICT on Education, Medicine, Business, Law Enforcement and Recreation.

Guidelines/Suggestions for Teaching Methods and Student Learning

Activities:

Lectures: Provide contextual background and detailed analysis of each topic.

Group Discussions: Facilitate discussions on the computer system.

Research Projects: Assign research on a topic related to the components of a computer system.

Differentiated Instruction: Tailoring instruction to meet the needs, strengths, and interests of each student.

Lecture-Demonstration: Combining lectures with demonstrations to enhance understanding through verbal and visual learning

Peer Teaching: Students teach their peers, which can reinforce their own learning and enhance their understanding.

Guidelines/Suggestions for Methods of Student Evaluation:

Quizzes and Tests: Regular assessments to check understanding of key concepts.

Classwork: Assignments completed during class that help monitor ongoing student progress and understanding.

Homework Assignments: Tasks assigned for completion outside of class, reinforcing concepts taught and promoting independent study.

Class Participation: Assessment based on engagement in discussions and activities.

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Presentations: Students present their research findings to the class.

Mock Exam: A comprehensive exam covering all course material.

Group Projects: Team assignments that assess collaborative and interpersonal skills along with individual contributions.

Peer Reviews: A process where students evaluate each other's work, providing feedback and gaining insights from peers.

Reflections: Written insights by students on their learning experiences, often discussing what they learned and areas for improvement.

Self-Grading: Allowing students to evaluate their own work, fostering self-reflection and critical thinking about their performance.

Online Quizzes and Exams: Digital tests that make use of technology to assess students' understanding in a more flexible or remote setting

Suggested Readings, Texts, Objects of Study:

- CSEC Information Technology Syllabus with Specimen Papers
- Oxford Information Technology for CSEC
- Information Technology for CSEC 2nd Edition (CXC Study Guide)

Bibliography of Supportive Texts and Other Materials

Bibliography

Glenda Gay, R. B. (2019). *Oxford Information Technology for CSEC (Third Edition)*. Oxford: Oxford University Press.

Howard Lincoln, A. P. (2019). *Information Technology for CSEC 2nd Edition (CXC Study Guide) Second Edition*. Oxford: Oxford University Press.