

Plan of Work

Computer Science (9618)

Grade 13 Sub

For examination in 2025



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Introduction

Resources:

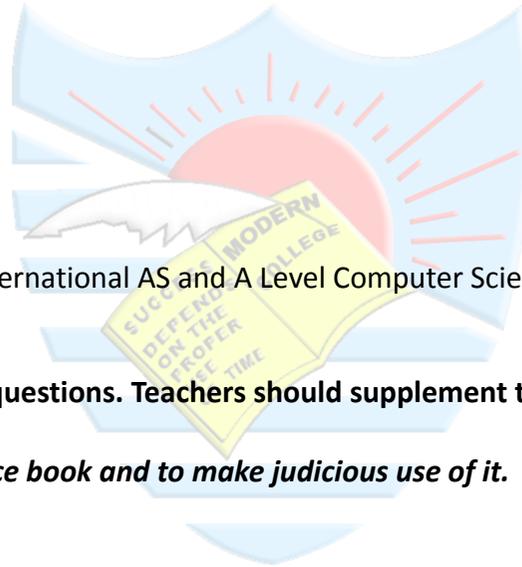
UCLES Past Papers

Reference book:

- Helen Williams and David Watson, Cambridge International AS and A Level Computer Science(Code: **[Book RB]**)

* Classworks and homeworks include a minimal list of questions. Teachers should supplement the work.

Students are STRONGLY advised to look for this reference book and to make judicious use of it.



Recommended prior knowledge

Learners beginning this course are expected to have knowledge of the following topics:

AS Level Content

1 Information representation

- 1.1 Data Representation
- 1.2 Multimedia – *Graphics, Sound*
- 1.3 Compression

2 Communication

- 2.1 Networks including the internet

3 Hardware

- 3.1 Computers and their components
- 3.2 Logic Gates and Logic Circuits

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4 Processor Fundamentals

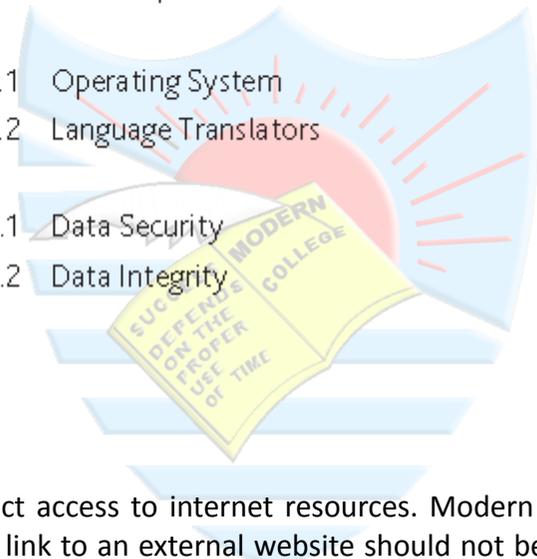
- 4.1 Central Processing Unit (CPU) Architecture
- 4.2 Assembly Language
- 4.3 Bit manipulation

5 System Software

- 5.1 Operating System
- 5.2 Language Translators

6 Security, privacy and data integrity

- 6.1 Data Security
- 6.2 Data Integrity



Websites and videos

This plan of work includes website links providing direct access to internet resources. Modern College is not responsible for the accuracy or content of information contained in these sites. The inclusion of a link to an external website should not be understood to be an endorsement of that website or the site's owners (or their products/services).

The website pages referenced in this plan of work were selected when the plan of work was produced. Other aspects of the sites were not checked and only the particular resources are recommended.

IMPORTANT NOTE: The objectives set in this plan of work are achievable if we have normal school days.

FIRST TERM [13/01/2025 – 11/04/2025]

Topic: 7.1 Ethics and Ownership

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Show understanding of the need for and purpose of ethics as a computing professional <ul style="list-style-type: none"> Understand the importance of joining a professional ethical body including BCS (British Computer Society), IEEE (Institute of Electrical and Electronic Engineers) 	[9608]: N18/12/5 N17/11/6b	[9608]: N17/11/6a J16/11/6 N17/12/5	[9608]: N18/13/3 J19/11/4a	<ul style="list-style-type: none"> Ethics https://www.youtube.com/watch?v=KA-yvOEvv94
Show understanding of the need to act ethically and the impact of acting ethically or unethically for a given situation	[9608]: N18/12/5	[9608]: N17/11/6a	[9608]: N18/13/3	<ul style="list-style-type: none"> Ethics https://www.youtube.com/watch?v=KA-yvOEvv94
Show understanding of the need for copyright Legislation	[9608]: J19/12/4d(ii),(iii)	[9608]: J19/12/4d(i)	[9608]: N18/11/3	<ul style="list-style-type: none"> Copyright and Patent Act https://www.youtube.com/watch?v=SC5MMkwv8WQ
Show understanding of the different types of software licencing and justify the use of a licence for a given situation <ul style="list-style-type: none"> Licences to include free Software Foundation, the Open Source Initiative, shareware and commercial software 	[9608]: J19/11/2a	[9608]: J16/11/5	[9608]: J16/13/3	<ul style="list-style-type: none"> Open source software https://www.youtube.com/watch?v=XyfknZ4MvWU

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<p>Show understanding of Artificial Intelligence (AI)</p> <ul style="list-style-type: none">• Understand the impact of AI including social, economic and environmental issues• Understand the applications of AI	<p>[7010]: J11/12/12 [9691]: N10/11/4</p>	<p>[9618]: Sp1/4e [9691]: N11/12/4</p>	<p>[9618]: Sp3/6a [9691]: N11/13/4</p>	<ul style="list-style-type: none">• What is AI? https://en.wikibooks.org/wiki/Artificial_Intelligence/Definition
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Topic: 8.1 Database Concepts

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
<p>Show understanding of the limitations of using a file-based approach for the storage and retrieval of data</p> <p>Describe the features of a relational database that address the limitations of a file-based approach</p>	<p>[9608]: J19/12/5a</p>	<p>[9608]: J16/11/8a(iv)</p>	<p>[9608]: J19/11/2b(i)</p>	<ul style="list-style-type: none"> ● Relational database https://www.youtube.com/watch?v=PZVIV8wC4gM
<p>Show understanding of and use the terminology associated with a relational database model</p> <p>Including entity, table, record, field, tuple, attribute, primary key, candidate key, secondary key, foreign key, relationship (one-to-many, one-to-one, many-to-many), referential integrity, indexing</p>	<p>[9608]: J17/11/1a,b,c(i),(ii)</p>	<p>[9608]: J16/11/8a J18/12/7b N16/11/1a</p>	<p>[9608]: J17/12/1b(ii),(iii)</p>	<ul style="list-style-type: none"> ● Database concepts https://www.youtube.com/watch?v=NvrpuBAMddw

Topic: 8.1 Database Concepts continued

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Use an entity-relationship (E-R) diagram to document a database design	[9608]: J16/13/5c(i)	[9608]: J15/11/5c(i) J16/13/5c(ii),(iii)	[9608]: J16/11/8b(i),(ii)	<ul style="list-style-type: none"> • ERD https://www.youtube.com/watch?v=dzedgQMUPUo
Show understanding of the normalisation process <ul style="list-style-type: none"> • First Normal Form(1NF), Second Normal Form (2NF) and Third Normal Form (3NF) 	[9691]: N13/31/2d(i)-(iii)	[9608]: J15/11/5a	[9608]: J18/12/7c	<ul style="list-style-type: none"> • Normalisation https://www.youtube.com/watch?v=UY3zc9G_YZo
Explain why a given set of database tables are, or are not, in 3NF Produce a normalised database design for a description of a database, a given set of data, or a given set of tables	[9691]: N13/31/2e	[9608]: J15/11/5c(ii),(iii)	[9608]: J18/12/7c	<ul style="list-style-type: none"> • Normalisation https://www.youtube.com/watch?v=UY3zc9G_YZo

Topic: 8.2 Database Management System (DBMS)

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
<p>Show understanding of the features provided by a Database Management System (DBMS) that address the issues of a file based approach Including:</p> <ul style="list-style-type: none"> • data management, including maintaining a data dictionary • data modelling • logical schema • data integrity • data security, including backup procedures and the use of access rights to individuals / groups of users 	<p>[9608]: J19/12/5b(ii)</p>	<p>[9608]: J16/13/5a,b</p>	<p>[9608]: J19/11/2b(ii)</p>	<ul style="list-style-type: none"> • Logical schema https://www.youtube.com/watch?v=rq6e9AeWRtE • Data modelling https://www.youtube.com/watch?v=y2DD8tAjMOE
<p>Show understanding of how software tools found within a DBMS are used in practice Including the use and purpose of:</p> <ul style="list-style-type: none"> • developer interface • query processor 	<p>[9608]: J19/12/5b(iii)</p>	<p>[9608]: J16/11/8a(ii),(iii)</p>	<p>[9608]: N17/12/7d</p>	<ul style="list-style-type: none"> • Query processor https://www.youtube.com/watch?v=PgXo4unl3FQ

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Topic: 8.3 Data Definition Language (DDL) and Data Manipulation Language (DML)

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Show understanding that DBMS carries out all creation / modification of the database structure using its Data Definition Language (DDL)	[9608]: J17/11/7d(i)	[9608]: J16/11/8b(iii),(iv) J16/13/5d(ii),(iii)	[9608]: J17/11/7e	<ul style="list-style-type: none"> DDL https://www.youtube.com/watch?v=XGO1gU415u0 https://www.youtube.com/watch?v=lljuqq5h15M
Show understanding that the DBMS carries out all queries and maintenance of data using its DML	[9608]: J16/13/5c, d	[9608]: J19/13/3e(iii)	[9608]: N20/12/5c(iii)	<ul style="list-style-type: none"> DML youtube.com/watch?v=6CzfqZU2k0c
Show understanding that the industry standard for both DDL and DML is Structured Query Language (SQL) <ul style="list-style-type: none"> Understand a given SQL script 	[9691]: J14/31/2d	[AQA]: COMPSCI-W-SQP/8b	[9691]: J14/31/2e,f	<ul style="list-style-type: none"> SQL https://www.youtube.com/watch?v=uQXgqFtxl_k

Topic: 8.3 Data Definition Language (DDL) and Data Manipulation Language (DML) continued

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
<p>Understand given SQL (DDL) commands and be able to write simple SQL (DDL) commands using a sub-set of commands</p> <ul style="list-style-type: none"> ● Create a database (CREATE DATABASE) ● Create a table definition (CREATE TABLE), including the creation of attributes with appropriate data types: <ul style="list-style-type: none"> ○ CHARACTER ○ VARCHAR(n) ○ BOOLEAN ○ INTEGER ○ REAL ○ DATE ○ TIME ● change a table definition (ALTER TABLE) ● add a primary key to a table (PRIMARY KEY (field)) 	<p>[9608]: J19/13/3(e)</p>	<p>[9608]: N16/12/9c J18/12/7d</p>	<p>[9608]: N19/13/3(c)</p>	<ul style="list-style-type: none"> ● Creating database https://www.youtube.com/watch?v=sHQhc5Jz6SQ

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<ul style="list-style-type: none"> add a foreign key to a table (FOREIGN KEY (field) REFERENCES Table (Field)) 				
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Topic: 8.3 Data Definition Language (DDL) and Data Manipulation Language (DML) continued

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Write an SQL script to query or modify data (DML) which are stored in (at most two) database tables <ul style="list-style-type: none"> Queries including SELECT... FROM, WHERE, ORDER BY, GROUP BY, INNER JOIN, SUM, COUNT, AVG Data maintenance including. INSERT INTO, DELETE FROM, UPDATE 	[9608]: J19/11/2c(iii)	[9608]: J17/11/1d J17/12/1c(i),(ii)	[9608]: J18/12/7d(i)	<ul style="list-style-type: none"> Retrieve data https://www.youtube.com/watch?v=YejAkhvh6N0&t=18s

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First Term Examinations

Component	Time Allocation	Type	Maximum Mark
Paper 1	1 ½ hours	short answer questions and structured questions	75

Paper 1 will consist of short answer questions, fill in the blanks, matching and structured questions. All questions are compulsory. No calculators are permitted in this paper.

SECOND TERM [28/04/2025 – 18/07/2025]

Topic: 9.1 Computational Thinking Skills

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Show an understanding of abstraction <ul style="list-style-type: none"> • Need for and benefits of using abstraction • Describe the purpose of abstraction, • Produce an abstract model of a system by only including essential details 	[9691]: N03/3/8 J13/32/7	[9691]: SP-2011/2/4a(ii), J13/22/3g-h	[9691]: N13/22/4, J05/3/8 [9618]: J21/22/2b [9618]: J22/21/3	<ul style="list-style-type: none"> • Abstraction https://www.youtube.com/watch?v=TVUvDdpml70
Describe and use decomposition <ul style="list-style-type: none"> • Break down problems into sub-problems leading to the concept of a program module (procedure / function) 	[9691]: N13/22/1a	[9608]: N18/21/4(c) N18/22/3(b) J19/23/2(a)(b) [9618] : J24/22/7a	[9691]: N13/21/1b(i),(ii) [9618]: N21/22/1a [9618]: J22/22/3b	<ul style="list-style-type: none"> • Decomposition https://www.youtube.com/watch?v=4Ub85T9ybBs&list=RDCMUC0HzEBLJxlrwBAHJ5S9JQg&index=2

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Topic: 9.2 Algorithms

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Show understanding that an algorithm is a solution to a problem expressed as a sequence of defined steps	[9608]: N15/21/4	[9608]: N17/23/2	[9608]: N17/22/2	<ul style="list-style-type: none"> • Representing algorithms https://www.youtube.com/watch?v=wwAblqsEj54
Use suitable identifier names for the representation of data used by a problem and represent these using an identifier table	[9608]: S15/2/2	[9608]: J15/22/1(a)(b)(i) [9618]: J22/22/1c	[9608]: J15/23/1(a)	<ul style="list-style-type: none"> • Suitable identifiers https://www.youtube.com/watch?v=9qPb1SQXuLg
Write pseudocode that contains input, process and output	[9608]: S15/2/1	[9608]: N15/21/4	[9608]: N15/21/3(b)	<ul style="list-style-type: none"> • Pseudocode https://www.youtube.com/watch?v=-mcA-Z_Bh1A7 :!0-14:42
Write pseudocode using the three basic constructs of sequence, selection and iteration (repetition) Document a simple algorithm using pseudocode	[9608]: N18/21/1(a)	[9608]: N18/21/1(a) [9618]: J21/22/1b, J24/22/1a	[9608]: N16/21/2(b) [9618]: N21/22/1d	<ul style="list-style-type: none"> • Constructs https://www.youtube.com/watch?v=VuQAYz-6yUs

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Topic: 9.2 Algorithms continued

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Write pseudocode from: <ul style="list-style-type: none"> • a structured English description • a flowchart 	[9608]: S15/2/1	[9608]: N15/21/4 [9618]: N21/22/2a, J24/22/2	[9608]: N1521/3(b) [9618]: J22/22/2	<ul style="list-style-type: none"> • Flowchart and pseudocode https://www.youtube.com/watch?v=DXEns9nWdqs
Describe and use the process of stepwise refinement to express an algorithm to a level of detail from which the task may be programmed	[9608]: N18/22/3(b)	[9608]: N17/22/2(a)(b)	[9608]: J19/23/2(a)(b)	<ul style="list-style-type: none"> • Stepwise refinement https://www.youtube.com/watch?v=DXEns9nWdqs
Use logic statements to define parts of an algorithm solution	[9608]: N15/21/3	[9608]: N15/21/3	[9608]: J17/21/1(a)(b)	<ul style="list-style-type: none"> • Logic statement https://www.youtube.com/watch?v=vOEN65nm4YU

Topic: 10.1 Data Types and Records

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
<p>Select and use appropriate data types for a problem solution</p> <ul style="list-style-type: none"> including integer, real, char, string, Boolean, date (pseudocode will use the following data types: INTEGER, REAL, CHAR, STRING, BOOLEAN, DATE, ARRAY, FILE) 	<p>[9608]: N18/22/1(b)(i)</p>	<p>[9608]: N18/21/1(b)(i) [9618] : J21/22/1a(i)</p>	<p>[9608]: J17/22/2(a)(b)</p>	<ul style="list-style-type: none"> Data types https://www.youtube.com/watch?v=A_R49e7su28&list=PLCiOXwirraUBO3Z2dxnIfuNDspmJmorJB
<p>Show understanding of the purpose of a record structure to hold a set of data of different data types under one identifier</p> <ul style="list-style-type: none"> Write pseudocode to define a record structure. Write pseudocode to read data from a record 	<p>[9608]: N15/42/6(a)</p>	<p>[9608]:N18/42/6 [9618]: N21/22/3a, J24/22/3</p>	<p>[9608]: Sp15/4/3(b)(c)</p>	<ul style="list-style-type: none"> Record structure https://www.youtube.com/watch?v=fphAVdSbXII 7:02-10:34

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Topic: 10.2 Arrays

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Use the technical terms associated with arrays <ul style="list-style-type: none"> Including index, upper and lower bound 	[9608]: S15/2/2/a, b, c(i)(ii)(iii)	[9608]: N18/23/3 [9618]: N21/22/1b	[9608]: J18/23/2(a)	<ul style="list-style-type: none"> Use of arrays https://www.youtube.com/watch?v=-tBUH5qfLL4
Select a suitable data structure (1D or 2D array) to use for a given task	[9608]: J17/22/5(a)	[9608]: J16/23/3	[9608]: J16/21/3	<ul style="list-style-type: none"> Arrays https://www.youtube.com/watch?v=b8s0-VLkVA0
Write pseudocode for 1D arrays	[9608]: J15/23/5	[9608]: N15/22/5 [9618]: J21/22/5a, J24/22/3b	[9608]: N17/22/2	<ul style="list-style-type: none"> 1D Arrays https://www.youtube.com/watch?v=oxLl97DnEVo

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Topic: 10.2 Arrays

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Write pseudocode for 1D and 2D arrays	[9608]: J15/23/5 J18/22/6	[9608]: N15/22/5 J18/21/6	[9608]: N17/22/2 J19/21/3(a)	<ul style="list-style-type: none">1D and 2D arrays https://www.youtube.com/watch?v=oxLI97DnEVo
Write pseudocode to process array data <ul style="list-style-type: none">Sort using a bubble sortSearch using a linear search	[9608]: N18/22/3(c)	[9608]: N17/22/3	[9608]: N17/21/3	<ul style="list-style-type: none">Linear search https://www.youtube.com/watch?v=0jnHaMRJp8E

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Topic: 10.3 Files

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Show understanding of why files are needed	[9608]: J16/21/5a	[9608]: J18/21/5(a)	[9608]: J16/23/5a [9618]: J21/21/3a	● File handling https://www.youtube.com/watch?v=VXxEBV2_Zw0
Write pseudocode to handle text files that consist of one or more lines	[9608]: J15/22/5(a)-(d) J15/22/5(e)	[9608]: J15/22/4(a)(b) J15/22/4(c) ; [9618] : J24/22/8	[9608]:J17/22/2 J18/22/5 [9618]: J22/22/4b	● File handling https://www.youtube.com/watch?v=HQ--D7GTsbs

Topic: 10.4 Introduction to Abstract Data Types (ADT)

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Show understanding that an ADT is a collection of data and a set of operations on those data	[9691] : N12/32/5 J12/33/3	[9691] : N12/32/5 N12/33/5	[9691] : N12/33/5	<ul style="list-style-type: none"> ADTs https://www.youtube.com/watch?v=2USMAwcRWHE
Show understanding that a queue is an example of ADTs <ul style="list-style-type: none"> Describe the key features of a queue and justify its use for a given situation 	[9608]: J19/41/1b	[9691]: N12/33/5a	[9691]: J08/1/5b(i)	<ul style="list-style-type: none"> Queue features https://www.youtube.com/watch?v=7_jYMk_R9k 4:20-5:29
Use a queue to store data <ul style="list-style-type: none"> Candidates will not be required to write pseudocode for this structure, but they should be able to add, edit and delete data from this structure 	[9691]: N14/32/1d [9608]: J15/42/6a	[9691]: N03/3/10a	[9691]: N13/13/9a	<ul style="list-style-type: none"> EnQueue and Dequeue https://www.youtube.com/watch?v=7_jYMk_R9k 5:30-5:49
Describe how a queue can be implemented using arrays	[9691]: N11/11/5b	[9691]: N03/3/10b	[9691]: J11/31/8a(ii)	<ul style="list-style-type: none"> Queues represented using arrays https://www.youtube.com/watch?v=7_jYMk_R9k 5:50-5:59

Topic: 10.4 Introduction to Abstract Data Types (ADT) continued

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Show understanding that a stack is an example of ADTs <ul style="list-style-type: none"> Describe the key features of a stack and justify its use for a given situation 	[9608]: J19/42/2a	[9608]: N18/41/3a	[9691]: J12/31/4d(i)	<ul style="list-style-type: none"> Stack features https://www.youtube.com/watch?v=7jYmk_R9k 0:15-1:05
Use a stack to store data <ul style="list-style-type: none"> Candidates will not be required to write pseudocode for this structure, but they should be able to add, edit and delete data from this structure 	[9608]: J19/41/1a	[9608]: J19/42/2b (i)(ii) J19/43/1a	[9691]: N13/13/9a	<ul style="list-style-type: none"> Push and pop https://www.youtube.com/watch?v=7jYmk_R9k 1:06-1:26
Describe how a stack can be implemented using arrays	[9691]: J04/3/6c	[9608]: N18/41/3b	[9691]: J03/1/4 J04/3/6c	<ul style="list-style-type: none"> Represent stack using array https://www.youtube.com/watch?v=7jYmk_R9k 1:27-1:39

Topic: 10.4 Introduction to Abstract Data Types (ADT) continued

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
<p>Show understanding that a linked list is an example of ADTs</p> <ul style="list-style-type: none"> Describe the key features of a linked list and justify its use for a given situation 	<p>[9608]: J16/41/1b</p>	<p>[9608]: N20/41/6b</p>	<p>[9608]: Sp/4/3a</p>	<ul style="list-style-type: none"> Features https://www.youtube.com/watch?v=sdO9cPdgVAK 0:30-1:10
<p>Use a linked list to store data</p> <ul style="list-style-type: none"> Candidates will not be required to write pseudocode for this structure, but they should be able to add, edit and delete data from this structure 	<p>[9608]: Sp/4/3</p>	<p>[9608]: N20/41/6a, b</p> <p>[9691]: J05/1/3a</p>	<p>[9608]: N20/43/6a, b</p> <p>[9691]: J08/1/5a</p>	<ul style="list-style-type: none"> Add and delete nodes https://www.youtube.com/watch?v=RJMfJJVed2s
<p>Describe how a linked list can be implemented using arrays</p>	<p>[9691]: J12/33/3a</p>	<p>[9691]: J16/32/5b, c</p>	<p>[9691]: J13/33/4b, c</p>	<ul style="list-style-type: none"> Representation using array https://www.youtube.com/watch?v=sdO9cPdgVAK 1:11-2:09

Topic: 11.1 Programming Basics

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Implement and write pseudocode from a given design presented as either a program flowchart or structured English	[9608]: J16/21/3b	[9608]: J16/23/3b	[9608]: N16/21/3(b)	<ul style="list-style-type: none"> Programming https://www.youtube.com/watch?v=odj11FMN2Ec
Write pseudocode statements for: <ul style="list-style-type: none"> the declaration of variables and constants the assignment of values to variables and constants 	[9608]: N16/23/6	[9608]: N16/22/6	[9608]: N15/22/1	<ul style="list-style-type: none"> Using variables https://www.youtube.com/watch?v=hXFOGTdc_Hk
Write pseudocode statements for: <ul style="list-style-type: none"> expressions involving any of the arithmetic or logical operators input from the keyboard and output to the console 	[9608]: N16/23/6	[9608]: N16/22/6	[9608]: N15/23/1	<ul style="list-style-type: none"> Using operators https://www.youtube.com/watch?v=5-zYdoUByf8
Use built-in functions and library routines <ul style="list-style-type: none"> Any functions not given in the pseudocode guide will be provided String manipulation functions will always be given 	[9608]: N18/21/1(b)	[9608]: N18/21/1(b) [9618]: J21/22/1a(ii), J24/22/1b, J24/22/6	[9608]: S15/2/3(e)	<ul style="list-style-type: none"> Built-in functions https://www.youtube.com/watch?v=mScqZcfNJak&list=PL04uZ7242_M5SBjixQD11Q2p7P4MT3W8H&index=3 3:00-5:00

Topic: 11.2 Constructs

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Use pseudocode to write: <ul style="list-style-type: none"> an 'IF' statement including the 'ELSE' clause and nested IF statements a 'CASE' structure a 'count-controlled' loop: 	[9608]: N15/21/3 N17/23/1(c)	[9608]: N15/22/2 N17/22/1(d)	[9691]: N06/1/3(a) J11/23/1(f)	<ul style="list-style-type: none"> Selection https://www.youtube.com/watch?v=xBAMBDyDu0s 2:20-3:25
Use pseudocode to write: <ul style="list-style-type: none"> a 'post-condition' loop a 'pre-condition' loop 	[9608]: J15/21/5(a)(b) J15/21/2(a)(b)(c) N15/21/5(b)	[9608]: J15/23/5(a)(b) N15/22/5 N16/21/2	[9608]: S15/2/2(a)(b)(c)(i)(ii) J19/21/3(a) N16/22/2(b)(c)	<ul style="list-style-type: none"> While loop https://www.youtube.com/watch?v=TuysZSLqh4M 3:28-3:40
Justify why one loop structure may be better suited to solve a problem than the others	[9608]: J15/21/2	[9608]: N15/21/6(b)	[9608]: J19/23/4	<ul style="list-style-type: none"> Loop structure https://www.youtube.com/watch?v=TuysZSLqh4M 2:40-3:05

Topic: 11.3 Structured Programming

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Define and use a procedure	[9608]: J16/23/5	[9608]: J17/21/5 J24/22/4	[9608]: N16/23/3(b)	<ul style="list-style-type: none"> ● Subroutine https://www.youtube.com/watch?v=mScqZcfNJak&list=PL04uZ7242_M5SBjjxQD11Q2p7P4MT3W8H&index=3 0:00-3:20
Explain where in the construction of an algorithm it would be appropriate to use a procedure	[9608]: N15/21/6(b)(c)	[9608]: N15/22/4(b)(c)	[9608]: N16/21/3(b)	<ul style="list-style-type: none"> ● Procedure https://www.youtube.com/watch?v=u_4z0QmnbqA
Use parameters <ul style="list-style-type: none"> ● A procedure may have none, one or more parameters ● A parameter can be passed by reference or by value 	[9608]: J17/22/4(b)	[9608]: J15/23/3(ii) N18/23/4(c)	[9608]: N17/22/1	<ul style="list-style-type: none"> ● Parameter Passing https://www.youtube.com/watch?v=IjN5U6bx7Ag

Topic: 11.3 Structured Programming continued

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Define and use a function	[9608]: J16/23/6	[9608]: N15/22/6	[9691]: J12/22/3	<ul style="list-style-type: none"> ● Subroutine https://www.youtube.com/watch?v=mScqZcfNJak&list=PL04uZ7242_M5SBjxQD11Q2p7P4MT3W8H&index=3 0:00-3:20
Explain where in the construction of an algorithm it is appropriate to use a function <ul style="list-style-type: none"> ● A function is used in an expression, e.g. the return value replaces the call 	[9608]: J16/21/3(a)	[9608]: N18/21/2	[9608]: J17/23/4(b)	<ul style="list-style-type: none"> ● Function https://www.youtube.com/watch?v=tzwjyVWiKmA
Use the terminology associated with procedures and Functions <ul style="list-style-type: none"> ● including Procedure / function header, procedure / function interface, parameter, argument, return value 	[9608]: J15/21/5(c)	[9608]: N16/21/3	[9608]: N16/22/4	<ul style="list-style-type: none"> ● Terminologies https://www.youtube.com/watch?v=1vcCx1ndV2Q
Write efficient pseudocode	[9608]: J15/23/5	[9608]: N18/23/2	[9608]: N15/23/6	<ul style="list-style-type: none"> ● Function https://www.youtube.com/watch?v=jz1QHoRJHTI

Topic: 12.1 Program Development Life cycle

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
<p>Show understanding of the purpose of a development life cycle</p>	<p>Worked example from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.</p>	<p>Worksheet prepared from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.</p>	<p>Worksheet prepared from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.</p>	<ul style="list-style-type: none"> Development methodologies https://www.youtube.com/watch?v=qEmrXu8d1ys
<p>Show understanding of the need for different development life cycles depending on the program being developed</p> <ul style="list-style-type: none"> Including, waterfall, iterative, rapid application development (RAD) 	<p>Worked example from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.</p>	<p>Worksheet prepared from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.</p>	<p>Worksheet prepared from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.</p>	<ul style="list-style-type: none"> Waterfall & RAD https://www.youtube.com/watch?v=qEmrXu8d1ys 2:42-4:24

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Describe the principles, benefits and drawbacks of each type of life cycle	Worked example from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.	Worksheet prepared from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.	Worksheet prepared from: https://www.tutorialspoint.com/sdlc/sdlc_overview.htm#:~:text=Software%20Development%20Life%20Cycle%20(SDLC,within%20times%20and%20cost%20estimates.	
Show understanding of the analysis, design, coding, testing and maintenance stages in the program development life cycle	[9608]: N16/21/4 [9618] : J24/22/1c	[9608]: N17/21/3(c)(i)	[9691]: N02/12/6a	<ul style="list-style-type: none"> ● Program Development cycle https://www.youtube.com/watch?v=-3sbzRKPJsM

Topic: 12.2 Program Design

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
<p>Use a structure chart to decompose a problem into sub-tasks and express the parameters passed between the various modules / procedures / functions which are part of the algorithm design</p> <ul style="list-style-type: none"> Describe the purpose of a structure chart Construct a structure chart for a given problem Derive equivalent pseudocode from a structure chart 	<p>[9608]: J19/22/3</p>	<p>[9608]: J15/21/3 J15/23/3 J17/23/4</p>	<p>[9608]: J19/23/3a N16/21/4d</p>	<ul style="list-style-type: none"> Structure charts https://www.youtube.com/watch?v=iOT1nDm2Rp0
<p>Show understanding of the purpose of state-transition diagrams to document an algorithm</p>	<p>[9608]: J15/41/1</p>	<p>[9608]: J15/43/1 , N16/42/1 , N17/41/1, J24/22/7b</p>	<p>[9608]: N16/41/1 J16/42/6</p>	<ul style="list-style-type: none"> STDs https://www.youtube.com/watch?v=dcl37iWDLvQ

Topic: 12.3 Program Testing and maintenance

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
Show understanding of ways of exposing and avoiding faults in programs	[9608]: N18/21/2(b)(c) N16/21/2(b)	[9608]: N18/22/2(b) J18/22/5b	[9608]: N18/23/2(b)(i)	<ul style="list-style-type: none"> ● Exposing faults https://www.youtube.com/watch?v=EZGuVwaP4kc
Locate and identify the different types of errors <ul style="list-style-type: none"> ● syntax errors ● logic errors ● run-time errors Correct identified errors	[9608]: N16/22/5(c)(iii) N17/22/2	[9608]: N18/22/2(b)(i) [9691]: J12/21/2 J12/23/3 [9618] : J24/22/5	[9691]: J03/1/3 [2210]: J19/22/2a	<ul style="list-style-type: none"> ● Spotting errors https://www.youtube.com/watch?v=iSYy84fD0n4
Show understanding of the methods of testing available and select appropriate data for a given method <ul style="list-style-type: none"> ● Including dry run, walkthrough, white-box, black-box, integration, alpha, beta, acceptance, stub 	[9608]: N18/23/2(b)(i) N18/22/2(b)(ii) J15/21/1(c)	[9608]: N18/23/2(b)(ii) N16/21/4(b)(ii) J17/21/6b(iii) J19/21/1(c)	[9608]: N18/21/3	<ul style="list-style-type: none"> ● Black box testing https://www.youtube.com/watch?v=00ai83RAEGU 0:00-2:25
Show understanding of the need for a test strategy and test plan and their likely contents	[9691]: N14/23/1d	[9608]: N16/21/1b		<ul style="list-style-type: none"> ● OCR – Test strategies

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				https://www.youtube.com/watch?v=0Oai83RAEGU
Choose appropriate test data for a test plan <ul style="list-style-type: none"> Including normal, abnormal and extreme/boundary 	[9691]: N11/23/1g	[9691]: N13/22/1d,	[9691]: J13/22/2c,	<ul style="list-style-type: none"> OCR – Suitable test data https://www.youtube.com/watch?v=ouh5DsxvJEk
Show understanding of the need for continuing maintenance of a system and the differences between each type of maintenance <ul style="list-style-type: none"> Including perfective, adaptive, corrective 	[9608]: J15/21/1(c) N15/22/5(a)	[9608]: J16/21/6 N18/21/3(c)	[9608]: J19/22/4 J19/23/5(a)	<ul style="list-style-type: none"> Trace table https://www.youtube.com/watch?v=xFtWK1_ZMP0
Analyse an existing program and make amendments to enhance functionality	[9608]: J19/21/4	[9608]: N17/21/2	[9608]: J19/22/4	<ul style="list-style-type: none"> Error correction https://www.youtube.com/watch?v=iSYy84fD0n4

Second Term Examinations

Component	Time Allocation	Type	Maximum Mark
Paper 1	1 ½ hours	short answer questions and structured questions	75
Paper 2	2 hours	short answer questions and structured questions	75

Paper 1 will consist of short answer questions, fill in the blanks, matching and structured questions. All questions are compulsory. No calculators are permitted in this paper.

Paper 2 will consist of short answer questions, fill in the blanks and structured questions. Candidates will need to write answers in pseudocode. All questions are compulsory. No calculators are permitted in this paper.

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THIRD TERM [11/08/2025 – 31/10/2025]

Topic: .:Revision classes:.

Learning Objectives	Worked Examples	Classwork & Homework	Extra Work	Resources
		November 2024 Paper 12 November 2024 Paper 22 June 2024 Paper 12 June 2024 Paper 22 November 2023 Paper 12 November 2023 Paper 22 June 2023 Paper 12 June 2023 Paper 22		