



وزارة التعليم
Ministry of Education

Sultanate of Oman



الإطار المنهجي لمادة تقنية المعلومات والاتصالات برنامج ثنائي اللغة للصفيين (11 - 12)

Information and Communication Technology Curriculum Framework.

Grades (11-12) – Bilingual Program

2026/2027



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القسم الأول / الصف 11: المنهج والمخرجات التعليمية للفصل الدراسي الأول

Section (1): Syllabus and Learning Outcomes for Grade 11 (Semester 1)

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Unit 1: Data Processing and Information

Unit 1 - Overview

The purpose of this unit is to enable students to understand some of the fundamental elements of Data processing and information. There are five areas of learning associated with this unit which cover:

- 1.1 The difference between data and information. Uses and impact of direct and indirect data sources.
- 1.2 The factors that affect the quality of information.
- 1.3 The need for encryption, encryption methods and protocols.
- 1.4 Checking the accuracy of data.
- 1.5 Data processing.

Unit 1 - Learning content & outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular text to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.

Data Processing and Information (13 Lessons)				
Topic	Learning outcomes (Students will be able to)	Lessons	Suggested CA	Final Exam
1.1 Data and Information	1. Define data and information. 2. Explain the difference between data and information. 3. Analyse the sources of direct and indirect data and how they are used 4. Discuss the advantages and disadvantages of direct and indirect data.	2	Short Test 1	✓
1.2 Quality of information	1. Describe the factors that affect the quality of information. Including: • accuracy • relevance • age • level of detail • completeness of the information.	2		✓
1.3 Encryption	1. Explain what encryption is and why it is important 2. Describe the methods of encryption 3. Describe encryption protocols 4. Explain the uses of encryption 5. Discuss the advantages and disadvantages of encryption protocols.	2		✓
1.4 Checking the accuracy of data	1. Define Validation and Verification 2. List and explain validation methods such as presence check, range check, type check, length check, format check, check digit, lookup check, consistency check, limit check. 3. List and explain verification methods such as visual checking and double data entry, parity check, checksum, hash total, control total. 4. Evaluate the need for both validation and verification 5. Discuss the advantage and disadvantage of validation and verification.	4		✓
1.5 Data Processing	1. Describe the processing methods (Batch, Online and Real-time) including examples and their uses.	3		✓

Unit 3: Monitoring and Control

Unit 3 - Overview

The purpose of this unit is to enable students to understand that how monitoring and control systems are an important part of our daily life. There are four areas of learning input associated with this unit which cover:

- 3.1 Monitoring and measurement technologies.
- 3.2 Control technologies.

Unit 3 - Learning content & outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.

Monitoring and Control (8 Lessons)				
Topic	Learning outcomes (Students will be able to)	Lessons	Suggested CA	Final Exam
3.1 Monitoring and measurement technologies	1. Define what is monitoring, measurement and control systems. 2. Explain sensors and how they collect data. 3. Discuss the advantages and disadvantages of sensors 4. Recognize a range of small sensors and their uses, examples of sensors including: heart rate, body mass composition, ECG, air pressure, GPS, temperature, motion. 5. Recognize a range of sensors and their uses, examples of sensors including: light/UV, temperature, pressure, humidity, sound, infrared, touch sensors, electromagnetic field sensors and proximity sensors. 6. State what is calibration and how it works. 7. Describe the methods used to calibrate devices. 8. Explain the uses of monitoring and technologies.	4	Short Test 2	✓
3.2 Control Technologies	1. Explain how control system works 2. Identify and explain with examples the types of sensors that can be used in control system 3. Define actuators 4. List the types of actuators with examples 5. State what is microprocessor? 6. Discuss the advantages and disadvantages of microprocessor in control technologies 7. Analyse how does control system work? 8. Suggest real world examples of control system 9. Discuss advantages and disadvantages of control technologies	4		✓

Unit 8: Spreadsheets

Unit 8 - Overview

The purpose of this unit is to enable students to understand the skills used in a spreadsheet software. The students will be able to perform many actions in spreadsheets including carrying out calculations and creating graphs and charts. There are eight areas of learning associated with this unit which covers:

- 8.1 Creating a spreadsheet.
- 8.2 Testing a spreadsheet.
- 8.3 Using a spreadsheet.
- 8.4 Graphs and charts.

Unit 8 - Learning content & outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.

Spreadsheets (36 Lessons)				
Topic	Learning outcomes (Students will be able to)	Lessons	Suggested CA	Final Exam
8.1 Creating a spreadsheet	1. Create page orientation 2. Create page size 3. Fit to size 4. Create page margins 5. Create header and footer 6. Insert and delete rows and columns 7. Hide rows and columns 8. Resize rows and columns 9. Merge cells 10. Apply validation rules and setup an appropriate error message 11. Protecting worksheets and workbook, cells, rows and columns 12. Create formulas using absolute, relative, named cells and ranges 13. Use functions count, lookup, IF, date and time, strings and numeric values, conditional formatting 14. Formatting cells.	27	Practical assignment/ Practical test	✖
8.2 Testing a spreadsheet	1. Test validations. 2. Test formulas and functions.	2		✖
8.3 Using a spreadsheet	1. Extracting data. 2. Sorting data. 3. Summarising and displaying data. 4. Importing and exporting data.	2		✖
8.4 Graphs and charts	1. Creating a graph or chart. 5. Apply chart formatting.	5		✖

القسم الثاني / الصف 11: المنهج والمخرجات التعليمية للفصل الدراسي الثاني

Section (2): Syllabus and Learning Outcomes Grade11(Semester 2)

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Unit 5: eSecurity

Unit 5 - Overview

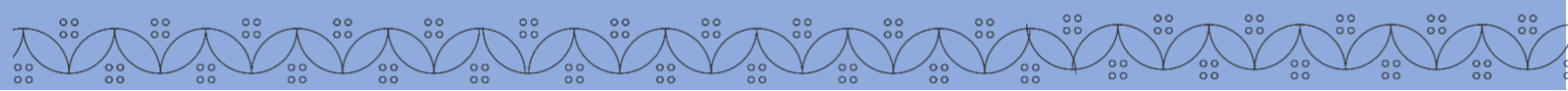
The purpose of this unit is to enable students to understand the preventive measures that can be taken while spending time online which does not endanger data and identity of the user. There are 2 areas of learning associated with this unit which cover:

- 5.1 What is personal data and how to keep it secure and prevent its misuse.
- 5.2 Recognize types and uses of malware, their consequences and methods of preventions.

Unit 5 - Learning Content & Outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.



eSecurity (11 Lessons)				
Topic	Learning outcomes (Students will be able to)	Lessons	Suggested CA	Final Exam
5.1 Personal Data	1. Explain what is meant by personal data with examples 2. Explain how and why to personal data should be kept confidential. 3. Explain how personal data can be kept secure 4. Discuss how personal data can be gathered by unauthorised persons: smising, vishing, phishing and pharming 5. Discuss the advantages and disadvantages of methods of preventing misuse of personal data.	4	Short Test 1	√
5.2 Malware	1. State what is malware? 2. Recognise types of malwares preventions their preventions including: virus, trojan, worm, spyware, adware, rootkit, malicious bots, ransomware 3. Discuss the uses of malware 4. Recognise the consequences of malware for organisations and individuals 5. Explain how to prevent malwares including software and physical 6. Discuss advantages and disadvantages of malware preventions.	7		√

Unit 6: The Digital Divide

Unit 6 - Overview

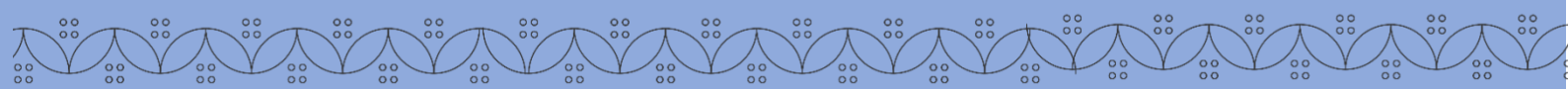
The purpose of this unit is to enable students to understand the meaning of Digital Divide at national and international level and how to take steps to prevent them. There are 3 areas of learning associated with this unit which cover:

- 6.1 What is Digital Divide.
- 6.2 Causes of Digital Divide.
- 6.3 Groups affected by the digital divide.

Unit 6 - Learning Content & Outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.



The Digital Divide (10 Lessons)				
Topic	Learning outcomes (Students will be able to)	Lessons	Suggested CA	Final Exam
6.1 What is digital divide?	1. Explain digital divide, demographic and economic.	10 lessons		√
6.2 Causes and effects of digital divide	1. Discuss the causes and effects of the digital divide.			√
6.3 Groups affected by the digital divide	1. Identify the groups affected by digital divide and give real life examples.			√

Unit 7: Expert system

Unit 7 - Overview

The purpose of this unit is to enable students to understand how expert systems are used to produce possible solutions for different scenarios. There are 2 areas of learning associated with this unit which cover:

- 7.1 Components of an expert system.
- 7.2 How are expert system used.
- 7.3 Backward chaining and forward chaining
- 7.4 Advantages and disadvantages of expert systems

Unit 7 - Learning Content & Outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.

Expert system (9 Lessons)				
Topic	Learning outcomes (Students will be able to)	Lessons	Suggested CA	Final Exam
7.1 Components of expert system	1. Define expert systems 2. Explain the components of expert system including: 3. a user interface, knowledge base (as a database of facts and rule base), interface engine, explanation system, a knowledge base editor.	3	Short Test 2	√
7.2 How expert systems used?	1. Discuss the scenarios how expert systems are used including: 4. medical diagnosis, car engine fault diagnosis, financial and planning, insurance planning, plant and animal identification, Route scheduling for delivery vehicles mineral prospecting	4		√
7.3 Backward and forward chaining	1. Explain backward chaining, forward chaining and artificial intelligence.	1		√
7.4 Advantages and disadvantages of expert system	1. Discuss the advantages and disadvantages of expert systems.	1		√

Unit 11: Video and audio editing

Unit 11 - Overview

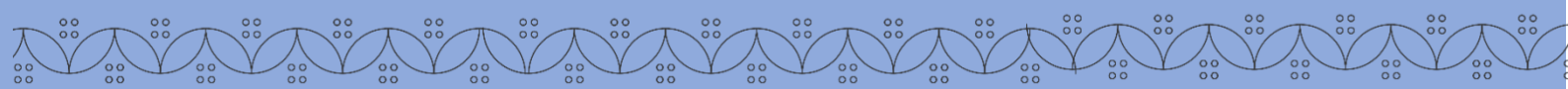
The purpose of this unit is to enable students to understand the skills used in a sound and video editing software. There are 7 areas of learning associated with this unit which cover:

- 11.1 Editing a video clip.
- 11.2 Audio editing.

Unit 11 - Learning Content & Outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.



Video and audio editing (22 Lessons)				
Topic	Learning outcomes (Students will be able to)	Lessons	Suggested CA	Final Exam
11.1 Editing a video	1. Set an aspect ratio. 2. Trim a video clip to remove unwanted footage. 3. Splicing/joining together video clips. 4. Adding titles, subtitles and cam 5. Adding appropriate credits 6. Using scrolling credits 7. Ensuring readability of text 8. Adding transitions and fading effects 9. Adding pan and zoom effects 10. Extracting a still image from a video clip 11. Inserting a still image 12. Resizing and cropping still image 13. Adding audio to a video clip 14. Editing audio within a video clip 15. Removing audio from a video clip 16. Altering the speed of a video clip 17. Using filters and colour correction 18. Exporting a video clip in different formats 19. Compressing a video to different resolutions	14	Practical assignment/ Practical test	x
11.2 Audio editing	1. Importing new tracks and adding track on existing audio clip. 2. Normalising an audio clip. 3. Trimming an audio clip. 4. Splicing/joining together two audio clips. 5. Fading in and fading out. 6. Altering the clip speed. 7. Changing the pitch. 8. Adding or adjusting delay/echo. 9. Adding or adjusting reverberation. 10. Chaining an audio clip from stereo to mono. 11. Applying equalisation. 12. Applying noise reduction. 13. Overdubbing including voiceover. 14. Compressing an audio file to different sample rate. 15. Exporting an audio clip in different file formats.	8		x

القسم الثالث / الصف 12: المنهج والمخرجات التعليمية للفصل الدراسي الأول

Section (3): Syllabus and Learning Outcomes Grade 12 (Semester 1)

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Unit 12: IT in Society

Unit 12 – Overview

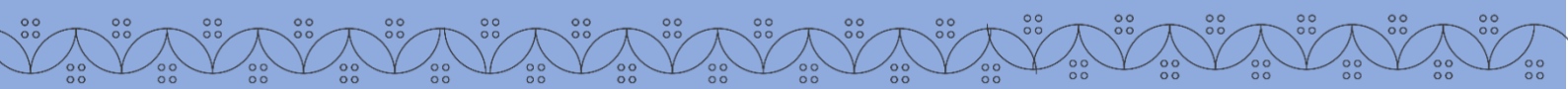
The purpose of this unit is to enable students to understand how IT has become an integral part of our society. How it affects many aspects of our life including how we spend money, how data is stored and mined, how to communicate and learn. There are five areas of learning associated with this unit which cover:

- 12.1 Digital/Electronic currency, types, advantages, and disadvantages.
- 12.2 Data mining, uses, advantages and disadvantages.
- 12.5 Technology enhanced learning

Unit 12 - Learning content & outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lessons** and **Learning outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.



12.1 Electronic currency (5 lessons)				
Topic	Learning Outcomes (Students will be able to)	Lessons	Suggested (CA)	Final exam
12.1.1 Digital/electronic currency	1. Define Digital/electronic currency 2. Explain the difference between electronic/digital currency and normal currency	1	Short test 1	✓
12.1.2 Types and characteristics and uses of digital currencies	1. List and explain the types of electronic currency/digital currency (Cryptocurrency, CBDC, Stored value cards). 2. Define cryptocurrency and list examples. 3. Analyze the historical price fluctuations of Bitcoin and their impact on the perception and adoption of cryptocurrencies. 4. Define central bank digital base money (CBDC) and its relationship to physical money. 5. Identify the examples of banks using CBDC 6. Analyze the impact of increased use of cryptocurrency on CBDC. 7. Describe what is meant by stored value cards. 8. Describe the uses of Stored value card with examples 9. Differentiate between open-loop and closed-loop stored value cards. 10. Differentiate between Centralised and decentralised currencies in terms of: ▪ Definition ▪ Examples	2		✓
12.1.4 Impacts and risks of digital currencies	Analyze the impact and risks of digital currencies • Individuals • Businesses • Governments • Global economy	1		✓

12.1.5 Advantages and disadvantages of different types of currency	Discuss the Advantages and disadvantages of the following currencies: • Cryptocurrency • Stored value cards • Central Bank Digital Currency	1		✓
12.2 Data mining (5 lessons)				
12.2.1 The process and stages of datamining.	1. Define data mining process 2. Define key terms and concepts related to data mining, such as data collection, data cleansing, data modeling, and results' evaluation. 3. Identify and describe the stages of data mining.	2		✓
12.2.2 Use of data mining	1. Describe the diverse applications of data mining in various sectors.	2		✓
12.2.3 Advantages and disadvantages of data mining to individuals and organizations	1. Discuss the advantages and disadvantages of data mining.	1		✓

12.5 Technology enhanced learning

12.5.1 Methods of delivery of technology-enhanced learning (5 lessons).

Computer based training	1. Explain the various applications of computer-based training in organizations and businesses. 2. Identify the features of CBT 3. Identify the various assessment methods used in CBT	1		✓
Online tutorials	1. Define online tutorials 2. Discuss the features and characteristics of online tutorials.			✓
Networked courses	1. Define networked learning 2. Explain the aims of networked learning. 3. Identify the role of a tutor in facilitating networked learning. 4. Analyze/ evaluate the contributions of other learners in networked learning	1		✓
MOOCs	1. Define MOOCs (Massive open online courses) 2. Identify the features of MOOCs 3. Identify the various assessment methods used in MOOCs.	1		✓
Video Conferencing	1 Define video conferencing 2 Identify the key features of video conferencing software. 3 Describe how video conferencing is used for teaching and learning. 4 Explain the factors that affects the quality of the lessons held via video conferencing 5 Evaluate the suitability of video conferencing for different educational contexts.	1		✓
12.5.2 Impact of technology enhanced learning	1. Analyze the Impact of technology-enhanced learning			✓
12.5.3 Advantages and disadvantages of different methods of delivery.	1. Analyze the advantages and disadvantages of different methods of delivery.	1		✓

Unit 14: IT Communications Technology

Unit 14 – Overview

This unit provides a comprehensive understanding of **networking, data transmission, communication protocols, wireless technologies, cloud computing, mobile communications, and network security**. It equips students with the knowledge required to understand how modern communication systems operate and how data is securely transmitted across networks. There are two areas of learning associated with this unit which cover:

- 14.1 Characteristics of networks.
- 14.2 Role and operation of components in a network.

Unit 14 - Learning content & outcomes

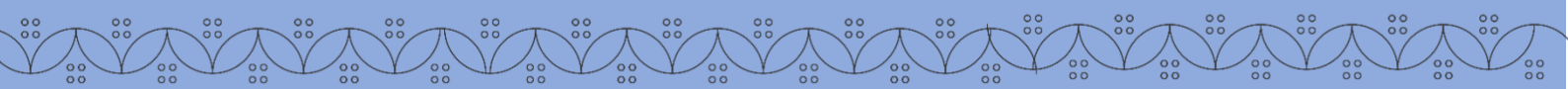
This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics, Lessons** and **Learning outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.

14 Communications technology

14.1 Networks (5 lessons)

Topic	Learning Outcomes (Students will be able to)	Lessons	Suggested (CA)	Final exam
14.1.1 Characteristics of networks	1. Define the following terms: a. Network b. Network topology c. Network architecture d. Network protocol 2. Differentiate physical and logical topologies 3. Describe the types of physical topologies	1	Short Test 2	✓
14.1.2 Types and uses of network	1. Define the following terms: a. Client b. Server c. Peer d. Data packet e. Tunnelling 2. Explain the following types of networks: a. Local area network b. Wide area network c. Client-server d. Peer-to-peer e. Virtual Private Network f. Mobile networks 3. Differentiate between LAN and WAN in terms of: a. Data transfer rate b. Data transmission error c. Methods of connection d. Security e. Ownership	3		✓
14.1.3 Advantages and disadvantages of types of network	1. Discuss advantages and disadvantages of networks	1		✓



14.2 Components in a Network (3 lessons)

14.2.1 Role and operation of components in a network	1. Define the following terms: a. Network b. interface card c. Router d. Switch e. Hub f. Repeater g. Wireless access point h. Bridge i. Gateway	3	Short Test 2	✓
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Unit 18: Mail Merge

Unit 18 – Overview

The purpose of this unit is to enable students to understand skills to create a mail merge document by merging data from source files into master document. There are six areas of learning input associated with this unit which cover:

- 18.1 Need for sources and master documents.
- 18.2 Creating, editing and using source data
- 18.3 Link a master document to a source file.
- 18.4 Creating a master document.
- 18.5 Inserting fields and properties.
- 18.6 Setting up fields for manual completion.
- 18.7 Specifying rules

Unit 18 - Learning content & outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lessons** and **Learning outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit

Mail Merge (21 Lessons)

Topic	Learning Outcomes (Students will be able to)	Lessons	Suggested (CA)	Final exam
18.1 The need for data sources and master documents.	1. Introduction to mail merge, Source file and master document.	2	Practical assignment / Practical test	×
18.2 Creating, editing and using source data.	1. Creating source data. 2. Editing the source data.	2		×
18.3 Link a master document to a source file.	1. Identifying and using correct field names 2. Embedding a chart or table. 3. Perform mail merge using the master document and data sources.	2		×
18.4 Creating a master document	1. Creating a master document for letters 2. Creating a master document for labels. 3. Creating a master document for a directory.	4		×
18.5 Inserting fields and properties	1. Inserting specified merge fields. 2. Inserting document properties. 3. Inserting document fields. 4. Inserting date/time fields	3		×
18.6 Setting up fields for manual completion.	1. Creating appropriate prompts for a user. 2. Using Fill-in and Ask fields. 3. Setting up fields for automatic completion calculations.	4		×
18.7 Specifying rules.	1. Rules for selecting recipients. 2. Excluding recipients by inserting conditional fields. 3. Next Record If.	4		×

Unit 21: Programming for the web

Unit 21 – Overview

The purpose of this unit is to enable students to understand JavaScript skills to enhance and add user interactivity to websites. There is one area of learning input associated with this unit which cover:

21.1 Use JavaScript to output data, images and change styles.

Unit 21 - Learning content & outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lessons** and **Learning outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.

Note: (Functions, Events, common HTML events & parameters in function are not included

Programming for the web (12 Lessons)				
Topic	Learning Outcomes (Students will be able to)	Lessons	Suggested (CA)	Final exam
21 Introduction	1. Define the term: a. HTML, b. CSS, c. element.	12	Practical assignment / Practical test	×
21.1 Using JavaScript	1. Writing JavaScript tag in the HTML. 2. Explain the purpose of using document.getElementById in JavaScript 3. Change HTML style by using document.getElementById command. 4. Write the output of simple codes that includes .innerHTML. 5. Explain the purpose of using pop-up boxes in JavaScript. 6. List the three types of pop-up boxes: alert, confirm, and prompt. 7. Write the syntax for displaying an alert box 8. Apply the syntax of alert to display specific text in an alert box. 9. Write the syntax for displaying a confirm box 10. Utilize confirm to prompt users with a message and store their response. 11. Write the syntax for displaying a prompt box 12. Use prompt to allow users to input text and store the entered value. 13. Explain the purpose and functionality of document.write in JavaScript. 14. Write the syntax of document. write code and apply it to output data to a web page. 15. Analyze the purpose of using console.log for debugging and error checking. 16. Apply console.log to output custom messages for debugging purposes. 17. Set or change the image using document.getElementById command.			×

القسم الرابع / الصف 12 : المنهج والمخرجات التعليمية للفصل الدراسي الثاني

Section (4): Syllabus and Learning Outcomes for Grade 12 (Semester 2)

Unit	Title	page
Unit 16	System Life Cycle	31
Unit 19	Graphic Creation	36

Unit 16: System Life Cycle

Unit 16 - Overview

The purpose of this unit is to enable students to understand the different stages and their requirements of a system life cycle. There are 9 areas of learning associated with this unit which cover:

16.1 Stages in system life cycle

16.1.1 Analysis

16.1.2 Design

16.1.3 Development & testing

16.1.4 Implementation

16.1.5 Maintenance

16.2 Methods of software development.

Unit 16 - Learning Content & Outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.

16.1 Stages in system life cycle (32 lessons)				
Topic	Learning Outcomes (Students should be able to)	Lessons	CA	Final Exam
Introduction	1 Describe the concept of the systems life cycle. 2 List the main stages of the systems development life cycle (SDLC). • Analysis • Design • Development and testing • Implementation • Maintenance 3 Explain the purpose of systems life cycle. 4 Define the term system.	1		
16.1.1 Analysis	2. Define the term analysis in the context of systems development. 3. Identify common research methods used in the analysis stage. 4. Explain how each research method is used to gather system requirements. 5. Compare questionnaires and interviews as methods of gathering information during system analysis. 6. Describe how to create an effective questionnaire. 7. Differentiate between online and paper-based questionnaires by highlighting their key features. 8. Evaluate appropriate interview questions to ask different stakeholders, such as managers or end users. 9. Assess existing documents to estimate the volume and type of data required for the new system. 10. Explain why document analysis is often used alongside other research methods. 11. Analyze the advantages and disadvantages of each research method used in system analysis. 12. Identify the main types of specifications.	5	Shorts Test 1	✓

	13. Evaluate the purpose and content of user requirement specifications, System specification and design specification in guiding system development.			
16.1.2 Design	1. Define the following terms in the context of system design: • design • data flow diagram (DFD) • system flowchart 2. Identify the key elements, purposes, and standard symbols used in data flow diagrams. 3. Identify the key elements, purposes, and standard symbols used in system flowcharts. 4. Identify the main elements of a data dictionary, such as field names, data types, field lengths, validation rules, and descriptions. 5. Identify different types of input forms used for data collection. 6. Identify key design principles to follow when creating effective data collection forms, including clarity, logical structure, and user-friendliness. 7. Describe the purpose and uses of screen layouts. 8. Outline the key principles for designing effective screen layouts. 9. Explain common validation routines used in data entry, such as range check, presence check, and format check. 10. Apply appropriate validation routines to ensure data accuracy during form completion. 11. Describe methods for verifying data collected through forms. 12. Identify key considerations when designing printed output layouts.	6		✓

16.1.3 Development and testing	1. Define the terms development, software developer, bugs, test plan and test data. 2. Explain the different types of test data, including valid, invalid, extreme, and live data. 3. Explain the purpose of testing in system development. 4. Define the terms alpha testing and beta testing. 5. Describe the differences between alpha and beta testing. 6. Define the terms black box testing and white box testing. 7. Describe the differences between black box testing and white box testing. 8. Evaluate the advantages and disadvantages of different types of testing. 9. Describe the importance of testing and the role of a structured test plan in system development. Analyze a test plan to identify its components.	4		✓
16.1.4 Implementation	1. Define the term implementation. 2. Identify the four methods of implementation: parallel, phased, pilot, and direct changeover. 3. Explain the four methods of implementation: parallel, phased, pilot, and direct. 4. Differentiate between the four implementation methods based on how they are introduced and managed. 5. Evaluate the key factors that influence the selection of an appropriate implementation method. 6. Discuss the advantages and disadvantages of each implementation method. 7. Define the terms: • requirement documentation • design documentation • technical documentation • user documentation. • Marketing documentation	8	Short test 2	✓

	8. Explain the purpose of all types of documentation. 9. Evaluate the advantages and disadvantages of the different types of documentation. 10. Define the term evaluation. 11. Identify key elements to be evaluated after system installation. 12. Describe common techniques used to evaluate a newly implemented system.			
16.1.5 Maintenance	1. Define the term maintenance. 2. Explain perfective maintenance and provide examples. 3. Explain adaptive maintenance with examples. 4. Explain the concept and purpose of preventive maintenance. 5. Discuss common preventive maintenance practices. 6. Explain corrective maintenance with examples. Evaluate the advantages and disadvantages of types of maintenance.	4		✓
16.2 Methods of software development	1. Define the terms Iterative, Incremental, Rapid application development (RAD) 2. Explain the methods of software development 3. Evaluate the advantages and disadvantages of each software development method.	4		✓

Unit 19: Graphic Creation

Unit 19 - Overview

The purpose of this unit is to enable students to understand the skills about image editing, including the difference between vector and bitmap images in a image editing software. There are 6 areas of learning associated with this unit which cover:

- 19.1 Common graphics skills
- 19.2 Vector graphics
- 19.3 Bitmap images.
- 19.4 Compression.
- 19.5 Text.

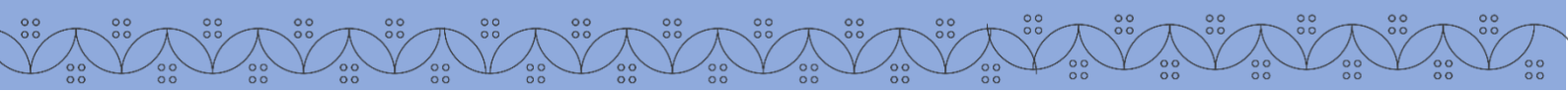
Unit 19 - Learning Content & Outcomes

This table on the following page is intended to provide teachers and students with guidance on the content of learning delivery for this unit. There is intentionally no reference to particular texts to provide teachers with the opportunity to draw on a wide range of learning resources and to encourage students to further develop their own research skills.

The table includes **Topics**, **Lesson required to complete the topic** and **Learning Outcomes** which detail what students should be able to do following completion of this unit. These learning outcomes form the basis of the assessment processes for this unit.

Graphic Creation (28 Lessons)				
Topic	Learning Outcomes (Students should be able to)	Lessons	CA	Final Exam
Introduction	1. Define the term vector, bitmap and Pixel 2. Differentiate between bitmap and vector images based on structure, scalability, and use cases.			✓
19.1 Common graphics skills	1. Define the term layer. 2. Work with layers. 3. Define opacity and transparency. 4. Change the opacity of all or part of an image. 5. Use transforms tools 6. Use grouping or merging tools 7. Use alignment and distribution tools 8. Use layout tools 9. Use color picker tools 10. Use crop tools 11. Describe the properties of different color systems (RGB, HSL, CMYK, CMS) 12. Differentiate between bitmap and vector file formats. 13. Identify different file formats (SVG, BMP, GIF, JPEG, PNG, TIFF, PDF) and their uses. 14. Export an image in different file formats 15. Change solid and gradient fills	2	Practical assignment/Practical test	1, 3, 11, 12, 13
19.2 Vector graphics	1. Define the terms Canvas and Bezier Curve 2. Use vector drawing tools 3. Selection tools to select and manipulate parts of a vector graphic. 4. Use node and path editing 5. Convert bitmap images into editable vector shapes 6. Discuss the advantages and disadvantages of converting a bitmap image into an editable vector shape.	7		1

19.3 Bitmap images	1. Use selection tools to select, remove or hide parts of a bitmap image 2. Working with colors 3. Use brush, pencil and pen tool. 4. Use tools to alter parts of an image 5. Use filters to alter parts of an image 6. Resizing the image/canvas 7. Define the term color depth.	8		x
19.4 Compression	1. Identify the main types of compression used in digital images. 2. Describe the characteristics and differences between lossless and lossy compression. 3. Discuss the effects of different compression methods on image quality, file size, and suitability for specific uses.	4		✓
19.5 Text	1. Select font style. 2. Fit text to path or shape. 3. Set text in a shape. 4. Convert text to curves. 5. Use of text and its manipulation within graphic software.	7		x



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