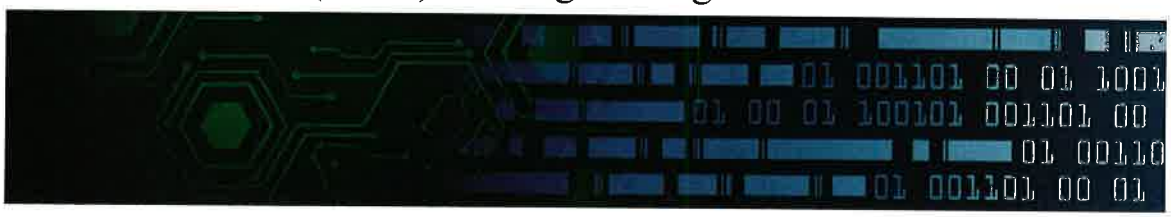
سلطنة عمان
وزارة التربية والتعليم
المديرية العامة للمدارس الخاصة
دائرة برامج ومناهج المدارس الخاصة

رؤية عمان 2040

الإطار المنهجي لمادة تقنية المعلومات والاتصالات
لبرنامج ثنائي اللغة للصفين (11-12) الفصل الدراسي الثاني

Information and Communication Technology Learning Outcomes for Grades (11-12) – Bilingual Program 2nd Semester



2023/2024

الفهرس العام

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الفصل الأول: المنهج والمخرجات التعليمية للصف 11

Section (1): Syllabus and Learning Outcomes Grade11

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Unit 4: eSecurity

Unit 4 - 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:

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

Unit 4 - 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.

Unit 4 - Learning Outcomes

Topic	Lessons Required to complete	Learning Outcomes (Students will be able to)	Suggested continuous assessments (CA)	Final Exam
4.1 Personal data	4 lessons	• Describe what is meant by personal data. • Explain how to keep it secure and prevent its misuse. • Discuss how personal data can be gathered by unauthorized persons and how this might be prevented. • Define the following terms: smishing, vishing, phishing and pharming • Evaluate the methods of prevention	Short Test 1	√
4.2 Malware	7 lessons	• Recognize types of malwares including Trojan Horse, worms, spyware, adware, rootkit, malicious bots, ransomware and others • Recognize the consequences of malware for organisations and individuals. • Explain how to prevent several types of malwares including software and physical		√

Unit 5: Digital Divide

Unit 5 - 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:

5.1 What is Digital Divide.
5.2 Causes of Digital Divide.
5.3 Identify the effects of Digital Divide and how they can be reduced.

Unit 5 - Learning Content & Outcomes

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Unit 5 - Learning Outcomes

Topic	Lessons Required to complete	Learning Outcomes (Students will be able to)	Suggested continuous assessments (CA)	Final Exam
5.1 City versus rural living	10 lessons	• Recognize what is meant by the Digital Divide Including: the gap between people and regions that have access to aspects of modern technology and information, and those with restricted or no access • Recognize the causes and effects of the digital divide and how this can be reduced. • Identify the groups affected include: People in cities and people in rural areas • Evaluate the effects of the digital divide include inequality of access to all types of internet services		√ √
5.2 Technology educated versus Technology uneducated		• Identify the groups affected include: the educated and uneducated • Recognize the causes and effects of the digital divide and how this can be reduced.		√
5.3 Older people v versus younger people		• Identify the groups affected include: the old and young • Recognize the causes and effects of the digital divide and how this can be reduced.		√
5.4 More industrially developed areas versus less More industrially developed areas		• Identify the groups affected include: more and less industrially developed/technologically aware nations. • Recognize the causes and effects of the digital divide and how this can be reduced.		√
5.5 Different socio-economic groups		• Identify the groups affected include: socioeconomic groups • Recognize the causes and effects of the digital divide and how this can be reduced.		√

Unit 6: Expert system

Unit 6 - 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:

6.1 How expert systems are used.
6.2 Components of expert systems.

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.

Unit 6 -Learning Outcomes

Topic	Lessons Required to complete	Learning Outcomes (Students will be able to)	Suggested continuous assessments (CA)	Final Exam
6.1 Components of an expert system	4 lessons	• Define expert systems. • Define Artificial Intelligence • Explain the components of an expert system including user interface, inference engine, knowledge base (as a database of facts and rules base), explanation system, knowledge base editor. • Explain backward chaining and forward chaining.	Short Test 2	√
6.2 Are expert system useful?	1 lesson	• Evaluate advantages that can be gained from using an expert system. • Evaluate the disadvantages to using the expert systems		√
6.3 How are expert systems used?	4 lessons	• Discuss the scenarios how expert systems are used including: mineral prospecting, investment analysis, financial planning, insurance planning, car engine fault diagnosis, medical diagnosis, route scheduling for delivery vehicles, plant and animal identification.		√

Unit 7 - 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:

7.1 Edit a video clip.
7.2 How and why typical features found in video editing software are used.
7.3 The effects of different comparison on video
7.4 Edit a sound clip.
7.5 How and why typical features found in sound editing software are used.
7.6 Why file size depends on sampling rate and sampling resolution.
7.7 The effects of different comparison on sound

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.

Unit 7- Learning Outcomes

Topic	Lessons Required to complete	Learning Outcomes (Students will be able to)	Suggested continuous assessments (CA)	Final Exam
7.1	14 lessons	• Edit a video clip to meet the requirements of its intended application and audience. • Set an aspect ratio. • Trim a video clip to remove unwanted footage. • Splice/join video clips. • Create text based slides. • Create credits • Add captions and subtitles • Add fading effects • Add pan and zoom effects • Add animation effects • Extract a still image from a video clip • Resize and crop a still image to match a video's aspect ratio • Insert a still image • Add sound to a video clip • Remove sound from a video clip • Alter the speed of a video clip • Use of filters and color correction • Export a video clip in different file formats (including: MP4, AVI, MOV, WMV • Compress a video to different resolutions to suit different media (including: DVD, internet)	Practical Lab Assessment 1 and 2	×
	8 lessons	• Discuss the effects of different methods of compression on video. • Explain why typical features found in video editing software are used. • Trim and crop a video clip • Create text based slides • Create credits • Add captions and subtitles • Add fading effects • Extract a still image from a video clip • Insert a still image • Add sound to a video clip • Export a video clip in different file formats • Compress a video to different resolutions		×
7.2	14 lessons	• Edit a sound clip to meet the requirements of its intended application and audience • Add a track to an existing sound clip		×

Topic	Lessons Required to complete	Learning Outcomes (Students will be able to)	Suggested continuous assessments (CA)	Final Exam
		• Normalize a sound clip including removing any DC offset. • Trim a sound clip to remove unwanted material • Splice/join together two sound clips • Fade in and fade out a sound clip • Alter the speed of a sound clip • Change the pitch of a sound clip • Add or adjust reverberation • Change a sound clip from stereo to mono • Apply equalization, high, low pass filters to a sound clip • Apply echo, delay to a sound clip • Apply noise reduction to a sound clip • Overdub a sound clip to include a voice over • Export a sound clip in different file formats including: MP3, MP4a, WAV, AAC) • Compress (including: the use of MP3) the sound file to different sample rates to suit different media		
	8 lessons	• Explain how and why typical features found in sound editing software are used Including: • Trim a sound clip • Splice/join together two sound clips • Fade in and fade out a sound clip • Normalize a sound clip • Apply noise reduction to a sound clip • Overdub a sound clip to include a voice over • Export a sound clip in different file formats • Compress (including: the use of MP3) the sound file		×
	3 lessons	• Explain why file sizes depend on sampling rate and sampling resolution • Including describing sampling rate and sampling resolution		×

Topic	Lessons Required to complete	Learning Outcomes (Students will be able to)	Suggested continuous assessments (CA)	Final Exam
	3 lessons	• Describe the effects of different methods of compression on sound including: how the different compression methods affect the audio quality, saving in files containers, lossy and lossless		×

الفصل الثاني: المنهج والمخرجات التعليمية للصف 12

Section (2): Syllabus and Learning Outcomes Grade 12

Index

Unit 4 - 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:

4.1 Analysis
4.2 Design
4.3 Development & testing
4.4 Implementation
4.5 Documentation
4.6 Evaluation
4.7 Maintenance
4.8 Prototyping
4.9 Methods of software development

Unit 4 - 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.

Topic	Lessons	Learning Outcomes (Students should be able to)	CA	Final Exam
4.1 Analysis (6 lessons)				
Introduction	1	• Describe what is meant by systems life cycle. • List the stages of SDLC. • Explain the purpose of systems life cycle.	Shorts Test 1	√
Methods of research	3	• Define the term analysis. • Identify the methods of researching. • Explain the methods of researching. • Difference between questionnaires and interviews in term of number of users. • Explain how to create an effective questionnaire. • Differentiate methods of questionnaires (online and paper based) • Evaluate the questions to be asked during interviews for (manager or an end user) • Evaluate and understand existing document to estimate the amount of data that is required. • Explain the reasons of using document analysis in conjunction with other methods. • Analyze the advantages and disadvantages of each analysis methods.		
Contents of specification	2	• Identify the types of specifications. • Differentiate between each specification • Evaluate the content and purpose of requirement specifications. • Differentiate between the different types of specification.		

Topic	Lessons	Learning Outcomes (Students should be able to)	CA	Final Exam
4.2 Design (5 lessons)				
System processing	2	• Define the terms Design, Data Flow Diagram (DFD), System flow chart. • Identify the elements, purposes and symbols of data flow diagrams. • Identify the elements, purposes and symbols of flowcharts.		√
Data storage	1	• Identify the elements of data dictionary.		x
Input forms and Output reports	2	• Identify the different types of input forms. • Identify the principles that should be followed while designing a data collection form. • Describe the uses of screen layouts. • Identify the principles that should be followed while designing a screen layout. • Explain and apply validation routines. • Describe the methods of verifying the data collected by forms. • Identify the consideration needs to make a printed copy layout		√
4.3 Development & testing (4 lessons)				
Test data	2	• Define the terms development and test data. • Explain the types of testing (Valid, Invalid, Extreme, and live data) • Explain the reasons for testing the data.		√
Alfa and Beta testing		• Define the terms alpha testing and beta testing. • Describe the differences between alpha and beta testing.		√

Topic	Lessons	Learning Outcomes (Students should be able to)	CA	Final Exam
Black box testing and white box testing		• Define the terms black box testing and white box testing. • Describe the differences between black box testing and white box testing		√
Importance of testing and having a test plan and Test Plans	2	• Describe the importance of testing and having a test plan. • Analyze a test plan. • Evaluate a test plan.		√
4.4 Implementation (4 lessons)				
Implementation	1	• Define the term implementation. • Identify methods of implementation (4 Ps)		√
Parallel running	2	• Explain the four methods of implementation. • Differentiate between the methods of implementation. • Describe the advantages and disadvantages of four implementation methods.		√
Direct changeover			Short Test 2	
Phased implementation				
Pilot implementation				
Choosing an implementation method	1	• Evaluate the factors that need to be taken into account to choose the suitable implementation method.		√

Topic	Lessons	Learning Outcomes (Students should be able to)	CA	Final Exam
4.5 Documentation (3 lessons)				
Technical documentation	1	• Define the term technical documentation. • List the items included in the technical documentation.		√
User documentation	1	• Define the term user documentation. • List the items included in the user documentation.		√
Why technical and user documentation is needed	1	• Explain why technical and user documentation needed.		√
4.6 Evaluation (1 lesson)				
Evaluation	1	• Define the term evaluation. • Identify the methods of evaluating in a new system. • Identify the elements that need to be evaluated after the system has been installed.		√
4.7 Maintenance (4 lessons)				
Perfective maintenance	1	• Define the term maintenance. • Explain perfective maintenance with an example.		√
Adaptive maintenance		• Explain adaptive maintenance with examples.		√
Preventative maintenance	1	• Explain preventive maintenance. • Discuss the ways of preventive maintenance.		√

Topic	Lessons	Learning Outcomes (Students should be able to)	CA	Final Exam
Corrective maintenance		• Explain corrective maintenance with an example.		√
How maintenance is carried out	2	• Identify the stages/activities (in order) of maintenance process model. • Evaluate the approaches to form a maintenance team. • Describe the stages of maintenance. • Describe what software re-engineering involves. • Explain the types of testing in test stage of maintenance.		√
4.8 Prototyping (2 lessons)				
Types of prototyping Advantages and disadvantages of prototyping	2	• Define the term prototype. • Explain different types of prototyping and explain why each is needed. • Evaluate advantages and disadvantages of each type of prototyping.		√
4.9 Methods of software development (4 Lessons)				
Types of development	2	• Define the terms incremental development and Iterative development. • Describe the differences between incremental development and Iterative development. • Describe the types of development.		x
Development methodology	2	• Describe the stages of waterfall method. • Explain advantages and disadvantages of the waterfall method. • Describe Agile and RAD approaches for software development. • Describe joint application development. • Evaluate the advantages and disadvantages of Agile and RAD software development methods.		x

Unit 5 - 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:

5.1 Types of images
5.2 Common graphics skills
5.3 Vector images.
5.4 Bitmap images.
5.5 Compression.
5.6 Text.

Unit 5 - Learning Content & Outcomes

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Topic	Lessons	Learning Outcomes (Students should be able to)	CA	Final Exam
5.1 Type of images				
Vector images	1 Lesson	• Define the term vector	Practical assignment/Practical test	√
Bitmap images		• Define the terms bitmap and pixel		√
The use of vector and bitmap images	1 Lesson	• Define the term DPI (dot per inch) • Describe the resolution requirements for different types of images. • Differentiate bitmap and vector images. • Explain the impact of image resolution on the file size. • Differentiate vector tools available in specialist drawing software and word processor. • Define the term pixilation. • Identify the deciding factors to select vector or bitmap images.		√ √
The use and impact of image editing on society	1 lesson	• Explain the tools of image editing software. • Discuss the positive effects of image editing. • Explain the problems associated with image manipulation in society. • Evaluate the advantages of vector graphics over bitmaps.		√ √

Topic	Lessons	Learning Outcomes (Students should be able to)	CA	Final Exam
5.2 Common graphic skills				
Common graphic skills	12 Lessons	1. Define the term layer 2. Work with layers 3. Use transforms tools 4. Use grouping or merging tools 5. Use alignment and distribution tools 6. Use layout tools 7. Use color picker tools 8. Use crop tools 9. Explain the properties of different color systems (RGB, HSL, CMYK, CMS) 10. Differentiate between bitmap and vector file formats. 11. Export an image in different file formats 12. Identify different file formats (SVG, BMP, GIF, JPEG, PNG, TIFF, PDF) and image types (Bitmap, Vector) 13. Define Opacity and transparency. 14. Change the opacity of all or part of an image	Practical assignment/Practical test	1, 9, 10, 12, 13
5.3 Vector images				
Vector images	7 lessons	1. Define the terms Canvas and Bezier Curve 2. Use vector drawing tools 3. Use node and path editing 4. Convert bitmap images into editable vector shapes	Practical assignment/Practical test	1
5.4 Bitmap images				
Bitmap images	8 lessons	• Use selection tools to select parts of a bitmap image • Adjust colour levels • Use tools/filters to alter parts of an image • Resize an image/canvas		x
5.5 Compression				
Compression	4 lessons	1. Identify the types of compression 2. Describe Lossless and lossy compression 3. Discuss the effects of different methods of compression on images 4. Define colour depth		1, 2,3, 4

5.6 Text				
Text	6 lessons	• Select font style • Fit text to path or shape • Set text in a shape • Convert text to curves		x

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End of the Newsletter