الإطار المنهجي لمادة تقنية المعلومات والاتصالات

برنامج ثنائي اللغة للصفين (11 - 12) للفصل الأول والثاني

**Information and Communication Technology Learning Outcomes.**

**Grades (11-12) – Bilingual Program- Semester 1 & Semester 2**

**2024/2025**

**Section (1): Syllabus and Learning Outcomes Grade11 (Semester 1)**

# 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.

## Unit 1 - Learning Outcomes

| Topic | Lessons | Learning outcomes (Students will be able to) | Suggested continuous assessments (CA) | Final exam |
|---|---|---|---|---|
| 1.1 Data and information | 2 lessons | • Define data and information.<br>• Explain the difference between data and information.<br>• Know and understand direct and indirect data, uses and sources.<br>• Evaluate advantages and disadvantages of direct and indirect data. | | ✓ |
| 1.2 Quality of information | 1 lesson | • Describe the factors that affect the quality of information.<br>Including: accuracy, relevance, age, level of detail and completeness of the information | | ✓ |
| 1.3 Encryption | 2 lessons | • Know and understand the need for encryption.<br>• Describe the methods of encryption.<br>• Describe encryption protocols.<br>• Explain the uses of encryption.<br>• Evaluate advantages and disadvantages of different protocols and methods of encryption. | Short test 1 | ✓ |
| 1.4 Checking the accuracy of data | 4 lessons | • Define Validation and verification.<br>• Describe the use of validation methods including: presence check, range check, type check, length check, format check, check digit, lookup check, consistency check, limit check.<br>• Describe the use of verification including: visual checking and double data entry, parity check, checksum, hash total, control total.<br>• Explain the need for both validation and verification | | ✓ |
| 1.5 Data Processing | 3 lessons | • Describe the processing methods (batch, online, real-time) including examples and their uses. | | ✓ |

# Unit 2: Monitoring and Control

## Unit 2 - 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:

2.1 Range of sensors and how they are used in monitoring systems.
2.2 Calibration and why sensors are calibrated.
2.3 Real life examples of monitoring systems.
2.4 Algorithms, Flowcharts, advantages and disadvantages of control systems.

## Unit 2 - 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 2 - Learning outcomes

| Topic | Lessons | Learning outcomes (Students will be able to) | Suggested continuous assessments (CA) | Final exam |
|---|---|---|---|---|
| 2.1 Sensors | 2 lessons | • Recognise a range of sensors, examples of sensors including light/UV, temperature, pressure, humidity, sound, infrared, touch sensors, electromagnetic field sensors and proximity sensors.<br>• Understand how they are used in monitoring systems.<br>• Evaluate advantages and disadvantages | | ✓ |
| 2.2 Calibration | 2 lessons | • Know what is meant by calibration?<br>• Understand why sensors need to be calibrated.<br>• Differentiate types of calibration and their corresponding methods. | Short test 2 | ✓ |
| 2.3 Monitoring systems | 1 lesson | • Define monitoring system.<br>• Know and understand the example of a monitoring system | | ✓ |
| 2.4 Control systems | 3 lessons | • Explain how microprocessor used?<br>• Evaluate the advantages and disadvantages of microprocessor in control systems.<br>• Explain how actuators are used.<br>• Explain advantages and disadvantages of actuators in control systems.<br>• Explain the stages in the process of a control system and their examples. | | ✓ |

## Unit 3 - 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:

3.1  Create structure.
3.2  Apply formatting.
3.3  Create formula and use functions.
3.4  Apply validation rules.
3.5  Test spreadsheet.
3.6  Extract data.
3.7  Create Macros.
3.8  Create graph and charts.

## 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.

## Unit 3 - Learning outcomes

| Topic | Lessons | Learning outcomes (Students will be able to) | Suggested continuous assessments (CA) | Final exam |
|---|---|---|---|---|
| 3.1 Create structure | 4 lessons | • Create page/screen structures.<br>• Create/edit spreadsheet structures<br>• Protect cells and their content<br>• Freeze panes and windows | | ✗ |
| 3.2 Create Formatting | 2 lessons | • Format cell contents<br>• Format cell emphasis | | ✗ |
| 3.3 Create formulas and use functions | 13 lessons | • Use formulas<br>• Relative and absolute referencing, named cells and ranges.<br>• Use functions | | ✗ |
| 3.4 Validation Rules | 2 lessons | • Apply validation rules and setup an appropriate error message | Practical assignment / Practical test | ✗ |
| 3.5 Test a spreadsheet structure | 2 lessons | • Test validation<br>• Test formulas and functions | | ✗ |
| 3.6 Use a spreadsheet | 5 lessons | • Extract data using filters.<br>• Sort data<br>• Summarise and display data using pivot tables and pivot charts.<br>• Import and export data. | | ✗ |
| 3.7 Automate operations within a spreadsheet | 3 lessons | • Create macros<br>• Customise the user interface | | ✗ |
| 3.8 Graphs & charts | 5 lessons | • Analyse and select a chart<br>• Formatting a graph or chart | | ✗ |

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

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| Unit 7 | Sound and video editing | 18 |

## 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.<br>• Explain how to keep it secure and prevent its misuse.<br><br>● Discuss how personal data can be gathered by unauthorized persons and how this might be prevented.<br><br>● Define the following terms:<br><br>smishing, vishing, phishing and pharming<br><br>• 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<br>• Recognize the consequences of malware for organisations and individuals.<br><br>● 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**

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 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<br>• Recognize the causes and effects of the digital divide and how this can be reduced.<br>• Identify the groups affected include: People in cities and people in rural areas<br><br>• Evaluate the effects of the digital divide include inequality of access to all types of internet services | | √<br><br>√ |
| 5.2 Technology educated versus Technology uneducated | | • Identify the groups affected include: the educated and uneducated<br>• 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<br>• 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.<br>• Recognize the causes and effects of the digital divide and how this can be reduced. | | √ |

| Topic | Lessons Required to complete | Learning Outcomes (Students will be able to) | Suggested continuous assessments (CA) | Final Exam |
|---|---|---|---|---|
| 5.5 Different socio-economic groups | | ● Identify the groups affected include: socioeconomic groups<br>● 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 | <ul><li>Define expert systems.</li><li>Define Artificial Intelligence</li><li>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.</li><li>Explain backward chaining and forward chaining.</li></ul> | Short Test 2 | √ |
| 6.2 Are expert system useful? | 1 lesson | <ul><li>Evaluate advantages that can be gained from using an expert system.</li><li>Evaluate the disadvantages to using the expert systems</li></ul> | | √ |
| 6.3 How are expert systems used? | 4 lessons | <ul><li>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.</li></ul> | | √ |

## Unit 7: Sound and video editing

### 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.<br>● Set an aspect ratio.<br>● Trim a video clip to remove unwanted footage.<br>● Splice/join video clips.<br>● Create text based slides.<br>● Create credits<br>● Add captions and subtitles<br>● Add fading effects<br>● Add pan and zoom effects<br>● Add animation effects<br>● Extract a still image from a video clip<br>● Resize and crop a still image to match a video's aspect ratio<br>● Insert a still image<br>● Add sound to a video clip<br>● Remove sound from a video clip<br>● Alter the speed of a video clip<br>● Use of filters and color correction<br>● Export a video clip in different file formats (including: MP4, AVI, MOV, WMV<br>● 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.<br>● Explain why typical features found in video editing software are used.<br>● Trim and crop a video clip<br>● Create text based slides<br>● Create credits<br>● Add captions and subtitles<br>● Add fading effects<br>● Extract a still image from a video clip<br>● Insert a still image<br>● Add sound to a video clip | | × |

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| Topic | Lessons Required to complete | Learning Outcomes (Students will be able to ) | Suggested continuous assessments (CA) | Final Exam |
|---|---|---|---|---|
| 7.2 | | ● Export a video clip in different file formats<br>● Compress a video to different resolutions | | |
| | 14 lessons | ● Edit a sound clip to meet the requirements of its intended application and audience<br>● Add a track to an existing sound clip<br>● Normalize a sound clip including removing any DC offset.<br>● Trim a sound clip to remove unwanted material<br>● Splice/join together two sound clips<br>● Fade in and fade out a sound clip<br>● Alter the speed of a sound clip<br>● Change the pitch of a sound clip<br>● Add or adjust reverberation<br>● Change a sound clip from stereo to mono<br>● Apply equalization, high, low pass filters to a sound clip<br>● Apply echo, delay to a sound clip<br>● Apply noise reduction to a sound clip<br>● Overdub a sound clip to include a voice over<br>● Export a sound clip in different file formats including: MP3, MP4a, WAV, AAC)<br>● 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:<br>● Trim a sound clip<br>● Splice/join together two sound clips<br>● Fade in and fade out a sound clip<br>● Normalize a sound clip<br>● Apply noise reduction to a sound clip | | × |

| Topic | Lessons Required to complete | Learning Outcomes (Students will be able to ) | Suggested continuous assessments (CA) | Final Exam |
|---|---|---|---|---|
| | | ● Overdub a sound clip to include a voice over<br>● Export a sound clip in different file formats<br>● Compress (including: the use of MP3) the sound file | | |
| | 3 lessons | ● Explain why file sizes depend on sampling rate and sampling resolution<br>● Including describing sampling rate and sampling resolution | | × |
| | 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 | | × |

## Unit 1: IT in Society

### Unit 1 – 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 live 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:

1.1 Electronic currency, types, advantages, and disadvantages.

1.2 Data mining, uses, advantages and disadvantages.

1.3 Social Networking, types, and impacts.

1.4 E-learning methods.

1.5 Monitoring and Surveillance

### 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 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.

**Unit 1 - Learning outcomes**

| Topic | Lessons | Learning outcomes | (CA) | Final exam |
|---|---|---|---|---|
| **1.1 Electronic currency (5 lessons)** | | | | |
| Introduction to electronic currency | 1 | • Define electronic currency<br>• Differentiate between electronic currency and physical currency, such as coins and banknotes. | | ✓ |
| Digital currency | 1 | • Define digital currency and its characteristics<br>• Identify popular forms of digital currency, such as credit cards, mobile payment apps, and stored value cards.<br>• Analyze the similarities and differences between digital currency and traditional payment methods in terms of convenience, security, and transaction processes<br>• Evaluate the advantages and disadvantages of digital currencies<br>• Describe the process of using mobile payment apps, such as Apple Pay and Google Pay®, for digital transactions using mobile devices.<br>• Analyze real-life scenarios and propose appropriate digital currency solutions based on specific payment requirements. | Short test 1 | ✓ |
| Virtual currency | 1 | • Differentiate between virtual currency and other types of digital currency.<br>• Differentiate between centralised and decentralised systems of currency management and regulation.<br>• Describe how virtual currency is used to facilitate transactions for in-game items or services.<br>• Analyze the advantages and disadvantages of using virtual currency compared to traditional forms of currency. | | ✓ |
| Cryptocurrency | 1 | • Define cryptocurrency and identify examples such as Bitcoin and Litecoin.<br>• Analyze the historical price fluctuations of Bitcoin and their impact on the perception and adoption of cryptocurrencies. | | ✓ |

| | | | |
|---|---|---|---|
| | | • Analyze the advantages and disadvantages of using cryptocurrencies compared to traditional financial systems<br>• Assess the potential risk associated with the use of cryptocurrencies.<br>• Evaluate the impact of cryptocurrencies on traditional banks and financial institutions. | |
| Central Bank Digital Base Money (CBDC) | 1 | • Define central bank digital base money (CBDC) and its relationship to fiat money.<br>• Recognize CBDC as the digital equivalent of bank notes and coins used in everyday payments.<br>• Identify the characteristics that CBDC shares with physical currency.<br>• Analyze the potential advantages and disadvantages of implementing CBDC in the financial system.<br>• Define and compare different types of electronic currency, including digital currency, virtual currency, cryptocurrency, and central bank digital base money. | ✘ |

**1.2 Data mining (4 lessons)**

| | | | |
|---|---|---|---|
| The process of data mining | 2 | • Define data mining process<br>• Define key terms and concepts related to data mining, such as data collection, data cleansing, data modeling, and results' evaluation<br>• Identify and describe the stages of data mining, such as business understanding, data understanding, data preparation, data modeling, evaluation, and deployment.<br>• Explain the importance of each stage and its role in the overall data mining process.<br>• Analyze the advantages and disadvantages of data mining for the individual or the organization. | ✓ |
| The use of data mining | 2 | • Discuss the diverse applications of data mining in various sectors, including national security, surveillance, business, research, healthcare, and predicting social and economic trends.<br>• Analyze the impact of data mining on national security and surveillance efforts.<br>• Evaluate the use of data mining in business decision-making processes and its potential for gaining a competitive advantage. | ✓ |

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|---|---|---|---|---|
| | | • Assess the role of data mining in research fields and its contributions to advancements in various industries.<br>• Analyze the ethical and privacy concerns associated with targeted advertising and sharing of personal data. | | |
| **1.3 Social networking (5 lessons)** | | | | |
| Introduction | 1 | • Define social networking<br>• Identify the various purposes of social networking, including entertainment, communication, and accessing news.<br>• Analyze the advantages and disadvantages of social networking | | ✓ |
| Chat rooms | | • Define chat rooms and their purpose as online platforms for real-time communication.<br>• Evaluate the potential use of chat rooms as a marketing tool for businesses and organizations. | | ✗ |
| Instant messaging | | • Define instant messaging<br>• Identify examples of social media platforms and other media that incorporate instant messaging features<br>• Evaluate the benefits of instant messaging for individuals and organizations, including its convenience, speed, and multimedia capabilities.<br>• Assess the effectiveness of using instant messaging to contact businesses for inquiries or complaints compared to other communication methods. | Short Test 2 | ✗ |
| Forums | 1 | • Define forums<br>• Identify the key differences between forums and chat facilities, including the level of live interaction and the ability to view previous responses.<br>• Explain the role of moderators in forums, including enforcing rules, removing posts, and blocking users who break the rules.<br>• Evaluate the advantages of using forums for seeking advice and support, such as the ability to access a wide range of responses from different users and the convenience of returning to the forum at a later time.<br>• Evaluate the effectiveness of forums as a support facility for businesses in terms of customer service and product support. | | ✓ |

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|---|---|---|---|---|
| Email | 1 | <ul><li>Define e-mail</li><li>Identify the key components of an email, including the sender's email address, the recipient's email address, and the message content.</li><li>Analyze the role of email as a primary method of communication for businesses and organizations, including its use for internal communication and customer outreach.</li><li>Evaluate the advantages of using email to deliver information directly to customers compared to relying solely on other communication channels, such as social media</li><li>Evaluate the effectiveness of using email to make complaints or inquiries to organizations, considering factors such as response time and clarity of communication.</li></ul> | | ✓ |
| Blogs and microblogs | | <ul><li>Define blogs, microblogs</li><li>Identify the characteristics of blogs, such as the reverse chronological order of posts and the use of online blogging software like WordPress and Squarespace.</li><li>Analyze the potential uses of blogs for businesses and organizations, such as providing information to customers, sharing company developments, or engaging with the community.</li><li>Evaluate the benefits of microblogs for organizations like police and law enforcement to provide timely updates to communities about local or national issues.</li><li>Evaluate the role of vloggers who use video content as a form of blogging and the influence they have in their respective communities.</li></ul> | | ✗ |
| Impact of social networking | 2 | <ul><li>Discuss the positive impact of social networking on individuals, such as global communication, connecting with like-minded people, and fostering a sense of belonging.</li><li>Discuss the negative impact of social networking on individuals, including mental health issues, constant comparison, influence on political and stereotypical thinking, and cyberbullying.</li><li>Analyze the impact of social networking on society, including its influence on communication patterns, social interactions, and personal identity formation.</li></ul> | | ✓ |

| | | | | |
|---|---|---|---|---|
| | | • Identify the concerns associated with social networking, such as cognitive issues and the need for immediacy. | | |
| **1.4 Technology enhanced learning (5 lessons)** | | | | |
| Computer based training | 1 | • Identify and explain the various applications of computer-based training in organizations and businesses.<br>• Evaluate the advantages of computer-based learning | | ✓ |
| Online tutorials | 1 | • Define online tutorials<br>• Discuss the features and characteristics of online learning<br>• Analyze the potential benefits and challenges of online courses | | ✓ |
| Networked learning | 1 | • Define networked learning<br>• Explain the aims of networked learning.<br>• Identify the role of a tutor in facilitating networked learning.<br>• Analyze/ evaluate the contributions of other learners in networked learning<br>• Evaluate the advantages and disadvantages of Networked learning | | ✓ |
| MOOCs | 1 | • Define MOOCs (Massive open online courses)<br>• Identify the components of MOOCs like filmed lectures, additional resources, and discussion forums for interaction with other learners and educators.<br>• Identify the various assessment methods used in MOOCs, such as peer review, written assignments, and online tests that are automatically graded.<br>• Analyze the advantages and disadvantages of MOOCs | | ✓ |
| Video Conferencing | 1 | • Define video conferencing<br>• Identify the key features of video conferencing software.<br>• Describe how video conferencing is used for teaching and learning.<br>• Explain the factors that affects the quality of the lessons held via video conferencing<br>• Evaluate the suitability of video conferencing for different educational contexts. | | ✓ |

| | | | | |
|---|---|---|---|---|
| | | • Summarize the benefits and challenges of video conferencing in education. | | |

**1.5 The impact of IT (5 lessons)**

| | | | | |
|---|---|---|---|---|
| IT in sport | | • Explain the purpose of using IT in sports, specifically in aiding referees and improving decision-making processes<br>• Write examples of how IT is used in sports, such as rugby union and tennis.<br>• Evaluate the effectiveness of IT systems like VAR or Hawk-Eye in enhancing the accuracy of refereeing decisions<br>• Justify his/her own viewpoint on the use of IT in sports, supporting it with evidence and logical reasoning. | | ✓ |
| IT in manufacturing | 2 | • Identify examples where robotics is used in manufacturing<br>• Demonstrate how robotics can be implemented in manufacturing to enhance productivity and worker safety<br>• Evaluate the potential advantages and disadvantages of using robotics in manufacturing, taking into account factors such as cost, efficiency, and workforce dynamics. | | ✓ |
| IT in medicine | | • Explain how IT enables the monitoring of patients' health.<br>• Describe the use of simulations to train doctors and nurses.<br>• Explain the benefits of using smart devices implanted in the body for health monitoring<br>• Describe how nanotechnology allows precise drug delivery in the body. | | ✓ |
| IT in education | | • Identify examples of technology used in the classroom, such as interactive whiteboards.<br>• Explain the potential benefits of using technology in the learning process. | | ✓ |
| IT in banking and finance | 1 | • Explain how IT enables large databases for transaction records.<br>• Identify the use of ATMs and their impact on customer convenience.<br>• List the online banking services available to customers.<br>• Summarize the advantages of using IT in banking and finance.<br>• Explain how IT reduces the need for physical bank visits and queues. | | ✗ |

| | | | | |
|---|---|---|---|---|
| E-business | | • Explain the role of IT in transforming traditional business models.<br>• Evaluate the advantages and disadvantages of online shopping from a customer perspective.<br>• Discuss the potential environmental benefits of online shopping. | | ✘ |
| News and media | | • Describe the impact of IT on people's awareness of global events.<br>• Identify the role of social media in enabling individuals to act as amateur journalists.<br>• Discuss the potential positive and negative effects of citizen journalism. | | ✓ |
| Family and home | 1 | • Identify the various services and functionalities that IT devices offer in the home.<br>• Analyze the impact of IT on energy consumption and sustainability in homes.<br><br>• Explain how IT devices provide entertainment and interactive experiences for families at home.<br>• Critique the potential drawbacks and challenges of relying on IT devices in the home. | | ✓ |
| Government and politics | | • Discuss how IT allows governments to understand and prioritize public issues.<br>• Explain how IT enables governments to provide online services to the public.<br>• Critique the potential risks and challenges of relying on IT in government and political processes. | | ✓ |
| Monitoring and surveillance | 1 | • Explain how IT is used in monitoring and surveillance<br>• Discuss the role of IT in monitoring and surveillance.<br>• Discuss how home surveillance systems and dashcams enhance security and provide evidence for insurance claims or criminal investigations.<br>• Discuss the arguments for and against the unregulated use of IT in monitoring and surveillance. | | ✓ |

## Unit 2: Mail Merge

**Unit 2 – 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:

2.1 Use, create and edit source data.
2.2 Create master document.
2.3 Link master document.
2.4 Specify rules.
2.5 Manual and automatic calculation fields.
2.6 Methods to check error-free accuracy.

**Unit 2 - 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.

**Unit 2 - Learning outcomes**

| Topic | Lessons | Learning Outcomes (Students will be able to ) | Suggested continuous assessments (CA) | Final exam |
|---|---|---|---|---|
| 2.1 Mail merge letters | 5 | • Create source files.<br>• Link a master document to a source file<br>• Setup fields<br>• Perform mail merge using the master document and data sources<br>• Update the source data<br>• Mail merge labels | Practical assignment / Practical test | ✖ |
| 2.2 manipulating mail merge document | 10 | • Create prompts<br>• Automatically select the required records<br>• Rules for managing document content<br>• Rules for selecting recipients | | ✖ |
| 2.3 Arithmetic operators | 2 | • Use calculated fields<br>• Use date and time fields | | ✖ |
| 2.4 Document properties | 2 | • Embedded data<br>• Embedded tables<br>• Embedded charts | | ✖ |
| 2.5 Error-free accuracy and proofreading | 1 | • Use manual methods and software tools to ensure error-free accuracy | | ✖ |

## Unit 3: Programming for the web

**Unit 3 – 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:

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

**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**, **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: (Only first five topics, 20.1 to 20.5)

**Unit 3 - Learning outcomes**

| Topic | Lessons | Learning Outcomes | (CA) | Final exam |
|---|---|---|---|---|
| Introduction to JavaScript | | • Explain the concept of JavaScript<br>• Define the term "keywords" in JavaScript | | ✓ |
| Outputting data | 2 | • Explain the purpose and functionality of document.write in JavaScript.<br>• Write the syntax of document.write code and apply it to output data to a web page.<br>• Explain the purpose of using document.getElementById in JavaScript<br>• Write the syntax of document.getElementById and apply it to target an HTML element by its ID.<br>• Write the output of simple codes that includes document.write.innerHTML | Practical assignment / Practical test | ✓ |
| Popup Boxes | 4 | • Explain the purpose of using pop-up boxes in JavaScript.<br>• List the three types of pop-up boxes: alert, confirm, and prompt.<br>• Write the syntax for displaying an alert box<br>• Apply the syntax of alert to display specific text in an alert box.<br>• Write the syntax for displaying a confirm box<br>• Utilize confirm to prompt users with a message and store their response.<br>• Write the syntax for displaying a prompt box<br>• Use prompt to allow users to input text and store the entered value.<br>• Analyze the purpose of using console.log for debugging and error checking.<br>• Apply console.log to output custom messages for debugging purposes.<br>• Analyze the differences between alert, confirm, and prompt in terms of their functionality and output. | | ✓ |
| Changing Images | 4 | • Set or change image using document.getElementById command | | ✗ |
| Changing HTML Style | 2 | • Change HTML style by using document.getElementById command | | ✗ |

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

| Unit | Title | page |
|------|-------|------|
| Unit 4 | System Life Cycle | 36 |
| Unit 5 | Graphic Creation | 43 |

## Unit 4: System Life Cycle

## 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.

**Unit 4 - Teaching Inputs and Learning Outcomes**

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

| Topic | Lessons | Learning Outcomes (Students should be able to) | CA | Final Exam |
|-------|---------|------------------------------------------------|----|-----------| 
|       |         |                                                |    |           |

**4.2 Design (5 lessons)**

| Topic | Lessons | Learning Outcomes (Students should be able to) | CA | Final Exam |
|-------|---------|------------------------------------------------|----|-----------| 
| System processing | 2 | ● Define the terms Design, Data Flow Diagram (DFD), System flow chart.<br>● Identify the elements, purposes and symbols of data flow diagrams.<br>● 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.<br>● Identify the principles that should be followed while designing a data collection form.<br>● Describe the uses of screen layouts.<br>● Identify the principles that should be followed while designing a screen layout.<br>● Explain and apply validation routines.<br>● Describe the methods of verifying the data collected by forms.<br>● Identify the consideration needs to make a printed copy layout | | √ |

**4.3 Development & testing (4 lessons)**

| Topic | Lessons | Learning Outcomes (Students should be able to) | CA | Final Exam |
|-------|---------|------------------------------------------------|----|-----------| 
| Test data | 2 | • Define the terms development and test data.<br>• Explain the types of testing (Valid, Invalid, Extreme, and live data)<br>● Explain the reasons for testing the data. | | √ |

| Topic | Lessons | Learning Outcomes (Students should be able to) | CA | Final Exam |
|---|---|---|---|---|
| Alfa and Beta testing | | • Define the terms alpha testing and beta testing.<br>● Describe the differences between alpha and beta testing. | | √ |
| Black box testing and white box testing | | • Define the terms black box testing and white box testing.<br>• 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.<br>• Analyze a test plan.<br>• Evaluate a test plan. | | √ |
| **4.4 Implementation (4 lessons)** | | | | |
| Implementation | 1 | ● Define the term implementation.<br>● Identify methods of implementation (4 Ps) | | √ |
| Parallel running | | | | |
| Direct changeover | 2 | ● Explain the four methods of implementation.<br>● Differentiate between the methods of implementation.<br>● Describe the advantages and disadvantages of four implementation methods. | Short Test 2 | √ |
| Phased implementation | | | | |
| Pilot implementation | | | | |

| Topic | Lessons | Learning Outcomes (Students should be able to) | CA | Final Exam |
|---|---|---|---|---|
| Choosing an implementation method | 1 | ● Evaluate the factors that need to be taken into account to choose the suitable implementation method. | | √ |
| **4.5 Documentation (3 lessons)** | | | | |
| Technical documentation | 1 | ● Define the term technical documentation.<br>● List the items included in the technical documentation. | | √ |
| User documentation | 1 | ● Define the term user documentation.<br>● 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.<br>● Identify the methods of evaluating in a new system.<br>● 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.<br>● Explain perfective maintenance with an example. | | √ |

| Topic | Lessons | Learning Outcomes (Students should be able to) | CA | Final Exam |
|---|---|---|---|---|
| Adaptive maintenance | | ● Explain adaptive maintenance with examples. | | √ |
| Preventative maintenance | 1 | ● Explain preventive maintenance. <br> ● Discuss the ways of preventive maintenance. | | √ |
| Corrective maintenance | | ● Explain corrective maintenance with an example. | | √ |
| How maintenance is carried out | 2 | ● Identify the stages/activities (in order) of maintenance process model. <br> ● Evaluate the approaches to form a maintenance team. <br> ● Describe the stages of maintenance. <br> ● Describe what software re-engineering involves. <br> ● Explain the types of testing in test stage of maintenance. | | √ |
| **4.8 Prototyping (2 lessons)** | | | | |
| Types of prototyping <br><br> Advantages and disadvantages of prototyping | 2 | ● Define the term prototype. <br> ● Explain different types of prototyping and explain why each is needed. <br> ● 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. <br> ● Describe the differences between incremental development and Iterative development. | | x |

| Topic | Lessons | Learning Outcomes (Students should be able to) | CA | Final Exam |
|---|---|---|---|---|
| | | ● Describe the types of development. | | |
| Development methodology | 2 | ● Describe the stages of waterfall method.<br>● Explain advantages and disadvantages of the waterfall method.<br>● Describe Agile and RAD approaches for software development.<br>● Describe joint application development.<br>● 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

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<br>(Students should be able to) | CA | Final Exam |
|---|---|---|---|---|
| **5.1 Type of images** | | | | |
| Vector images | 1 Lesson | • Define the term vector | | √ |
| Bitmap images | | • Define the terms bitmap and pixel | | √ |
| The use of vector and bitmap images | 1 Lesson | • Define the term DPI (dot per inch)<br>• Describe the resolution requirements for different types of images.<br>• Differentiate bitmap and vector images.<br>• Explain the impact of image resolution on the file size.<br>• Differentiate vector tools available in specialist drawing software and word processor.<br>• Define the term pixilation.<br>• Identify the deciding factors to select vector or bitmap images. | Practical assignment/Practical test | √ |
| | | | | √ |
| | | | | √ |
| The use and impact of image editing on society | 1 lesson | • Explain the tools of image editing software.<br>• Discuss the positive effects of image editing.<br>• Explain the problems associated with image manipulation in society.<br>• 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<br>2. Work with layers<br>3. Use transforms tools<br>4. Use grouping or merging tools<br>5. Use alignment and distribution tools<br>6. Use layout tools<br>7. Use color picker tools<br>8. Use crop tools<br>9. Explain the properties of different color systems (RGB, HSL, CMYK, CMS)<br>10. Differentiate between bitmap and vector file formats.<br>11. Export an image in different file formats<br>12. Identify different file formats (SVG, BMP, GIF, JPEG, PNG, TIFF, PDF) and image types (Bitmap, Vector)<br>13. Define Opacity and transparency.<br>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<br>2. Use vector drawing tools<br>3. Use node and path editing<br>4. Convert bitmap images into editable vector shapes | | 1 |
| **5.4 Bitmap images** | | | | |
| Bitmap images | 8 lessons | • Use selection tools to select parts of a bitmap image<br>• Adjust colour levels<br>• Use tools/filters to alter parts of an image<br>• Resize an image/canvas | Practical assignment/Practical test | x |
| **5.5 Compression** | | | | |
| Compression | 4 lessons | 1. Identify the types of compression<br>2. Describe Lossless and lossy compression<br>3. Discuss the effects of different methods of compression on images<br>4. Define colour depth | | 1, 2,3, 4 |

| 5.6 Text | | | | |
|---|---|---|---|---|
| Text | 6 lessons | 5. Select font style<br>6. Fit text to path or shape<br>7. Set text in a shape<br>8. Convert text to curves | | x |

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**End of the Newsletter**