

**EDUCATIONAL QUALITY AND
ASSESSMENT PROGRAMME
[EQAP]**



Pacific
Community

Communauté
du Pacifique

**SOUTH PACIFIC FORM SEVEN
CERTIFICATE [SPFSC]**

**INFORMATION and
COMMUNICATIONS TECHNOLOGY
SYLLABUS**

GENERAL INFORMATION

The Office of the Educational Quality and Assessment Programme (EQAP) is located at:

3 Luke Street, Nabua
Suva
Fiji

Tel: (679) 3315600
Email: eqap@spc.int
Web: www.spc.int / www.eqap.org.fj

Any correspondence regarding this syllabus should be addressed to:

The Director EQAP
Pacific Community (SPC)
Private Mail Bag
Suva
Fiji

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SOUTH PACIFIC FORM SEVEN CERTIFICATE

INFORMATION and COMMUNICATION TECHNOLOGY

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INFORMATION AND COMMUNICATION TECHNOLOGY

1. PREAMBLE

This syllabus defines the requirements for the South Pacific Form Seven Certificate Information and Computer Technology.

This syllabus is derived from a revision of the South Pacific Board for Educational Assessment (SPBEA) syllabus in Information Technology and a wide review of international trends in senior secondary school Information and Computer Technology syllabus.

Information and Communication Technology continues to be a rapidly changing field which encompasses a very large realm. New trends in the study of ICT indicate rapid expansion of content, and what was relevant a short time ago has changed markedly. It is anticipated that this evolution will continue because there is no apparent end to developments in this particular technology.

This course is comparable in standard to other Year 13 courses available in the international field. The course is designed so students may continue their studies in ICT at a tertiary level, or complete their formal education at the end of Year 13.

2. AIMS

Information and Communication Technology encompasses a vast realm of knowledge and skills. This course is designed to let the student explore a number of different aspects of that realm and to engender an attitude of challenge and exploration within these aspects. The use of ICT to generate original content is intended to encourage the student to experiment with the medium as a tool rather than as an end in itself.

It is intended that students work in teams for particular sections so that they gain experience of how many ICT environments function.

It is intended that students should be able to see ICT as a means of creating a solution to particular problems and to be able to choose an appropriate tool from the vast number available to produce the solution.

This course is generic in its approach. It is recognised there are multiple ways in ICT to reach any particular endpoint. Students should recognise this and they should be encouraged to be creative within the medium to ensure they are fully engaged in the course.

Despite the overwhelming benefits that we share and experience in the use of new technological innovations, students should also understand that there are known issues that are becoming visible now that is affecting and will continue to affect the way we live and work. Such issues are presented in this course.

3. PRE-REQUISITES

Students should have completed a course of study in Computer Studies or its equivalent at Year 12 level.

Schools should ideally meet these conditions to ensure students succeed in ICT:

1. The school needs enough computers running WinXP or higher (or equivalent operating system) to give each student individual access to a computer for at least 1 hour per week.

2. ICT classes should be scheduled to use the computers for each teaching period.
3. The computers should be networked.
4. Internet access needs to be available, preferably regularly.

Teachers must see themselves as facilitators of learning rather than transmitters of knowledge. Teachers must acknowledge that in some areas their students will know more than them and they must use this to the advantage of the class rather than suppress such student knowledge.

4. GENERAL OBJECTIVES

On completing this course students should be able to:

- use ICT to produce appropriate solutions to a variety of IT problems and utilise effective ICT tools to reach that solution
- recognise that ICT is a very large realm of knowledge and that further study in it will lead to greater specialisation in a narrowing field
- act as a responsible Digital Citizen who respects the law, the rights of others, and keeps safe in a digital world

5. CONTENT COMPONENTS

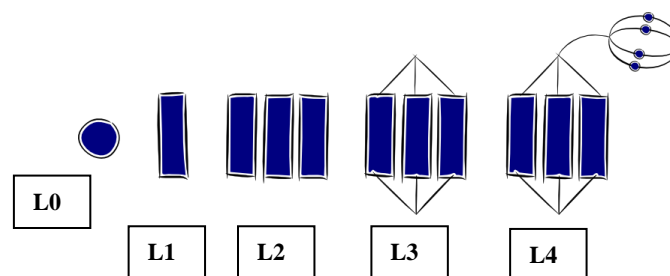
The content of the SPFSC ICT course is organised under five strands and a number of sub-strands under each strand. These are outlined below:

STRAND NUMBER	STRAND TITLE	SUB STRAND NUMBER	SUB-STRAND TITLE
1.	DIGITAL MEDIA	1.1	Digital Media Applications and Sources
		1.2	Digital Media Concepts
		1.3	Digital Media Design/Processing
2.	WEBSITE DEVELOPMENT	2.1	Web Design
		2.2	Database Driven Website
3.	PROGRAMMING	3.1	Problem Solving
		3.2	Stages of Programming
		3.3	Coding
4.	MICROPROCESSOR PROGRAMMING	4.1	Programmable Microprocessor
		4.2	Embedded Devices
5.	ISSUES IN ICT	5.1	Ethical & Social Issues
		5.2	Environmental Issues
		5.3	Health Issues
		5.4	Safety & Security Issues

6. UNPACKING LEARNING OUTCOMES

In this syllabus, Learning Outcomes are stated at three levels of generality: Major Learning Outcomes (MLOs) are stated at the strand level, Key Learning Outcomes (KLOs) are stated at the sub-strand level, and Specific Learning Outcomes (SLOs) are unpacked from the Key Learning Outcomes. Each SLO is a combination of cognitive skill and a specific content component. Each SLO is given a skill level, level 1 – 4, and this skill level results from the categorisation of the cognitive skill that is embedded in the SLO using the SOLO taxonomy¹.

The SOLO taxonomy provides a simple, reliable and robust model for three levels of understanding – surface deep and conceptual (Biggs and Collis 1982).



At the **prestructural** level (L0) of understanding, the task is inappropriately attacked, and the student has missed the point or needs help to start. The next two levels, unistructural and multistructural are associated with bringing in information (surface understanding). At the **unistructural** level (L1), one aspect of the task is picked up, and student understanding is disconnected and limited. The jump to the multistructural level is quantitative. At the **multistructural** level (L2), several aspects of the task are known but their relationships to each other and the whole are missed. The progression to relational and extended abstract outcomes is qualitative. At the **relational** level (L3), the aspects are linked and integrated and contribute to a deeper and more coherent understanding of the whole. At the **extended abstract** level (L4), the new understanding at the relational level is re-thought at another conceptual level, looked at in a new way, and used as the basis for prediction, generalisation, reflection, or creation of new understanding (adapted from Hook and Mills 2011). [<http://pamhook.com/solo-taxonomy/>]

The progression from Level 1 to Level 4 is exemplified in the progression from *define* □ *describe* □ *explain* □ *discuss* with each succeeding level indicating a *higher level of understanding*, as follows:

- define – to state a basic definition of a concept [Unistructural or L1]
- describe– to give the characteristics of, or give an account of, or provide annotated diagrams. [Multistructural or L2]
- explain– to provide a reason for a relationship – an event and its impact, a cause and an effect, as to how or why something occurs. [Relational or L3].
- discuss – this means linking ideas (descriptions, explanations) to make generalisations or predictions or evaluations. It may involve relating, comparing, analysing, and justifying. [Extended abstract or L4].

¹ Structure of Observed Learning Outcomes by Biggs and Collis (1982)

7. LEARNING OUTCOMES

Strand 1: Digital Media

Major Learning Outcome (Inf1):

Students are able to demonstrate an understanding of the differences between Open Source and Proprietary software and are able to use digital media concepts in ICT to design and develop a media product.

Sub Strand 1.1: Digital Media Applications & Sources

Key Learning Outcome (Inf1.1):

Students are able to differentiate between Open Source and Proprietary software, make software assessments and identify digital media applications for installation.

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	List the two categories of software. [Open Source and Proprietary]	1	inf1.1.1.1
2.	Define Open source software.	1	inf1.1.1.2
3.	Define Proprietary software.	1	inf1.1.1.3
4.	State a key strength of an Open Source software.	1	inf1.1.1.4
5.	State a key strength of a Proprietary software.	1	inf1.1.1.5
6.	State a key weakness of an Open Source software.	1	inf1.1.1.6
7.	State a key weakness of a Proprietary software.	1	inf1.1.1.7
8.	Outline the strengths of Open Source software.	2	inf1.1.2.1
9.	Outline the weaknesses of Open Source software.	2	inf1.1.2.2
10.	Outline the strengths of Proprietary software.	2	inf1.1.2.3
11.	Outline the weaknesses of Proprietary software.	2	inf1.1.2.4
12.	Explain the strengths of Open Source software.	3	inf1.1.3.1
13.	Explain the weaknesses of the Open Source software.	3	inf1.1.3.2
14.	Explain the strengths of Proprietary software.	3	inf1.1.3.3
15.	Explain the weaknesses of Proprietary software.	3	inf1.1.3.4
16.	Evaluate the software requirements for an organisation in terms of the key strengths and weaknesses of Open source and Proprietary software.	4	inf1.1.4.1
17.	Identify an Open Source media application on the Internet.	1	inf1.1.1.8
18.	Identify a free trial version of Proprietary media application on the Internet.	1	inf1.1.1.9
19.	Name an example of an Open Source Software.	1	inf1.1.1.10
20.	Name an example of a Proprietary Software.	1	inf1.1.1.11

21.	List examples of Open Source media applications.	2	inf1.1.2.5
22.	List examples of Proprietary media applications.	2	inf1.1.2.6
23.	Download an Open Source media application.	1	inf1.1.1.12
24.	Download a free trial version of a Proprietary media application.	1	inf1.1.1.13
25.	Prepare and install an Open Source media application.	2	inf1.1.2.7
26.	Prepare and install a free trial version of a Proprietary media application.	2	inf1.1.2.8
27.	State a part of the uninstallation process.	1	inf1.1.1.14
28.	Describe the uninstallation process.	2	inf1.1.2.9
29.	Explain the importance of using the uninstallation process.	3	inf1.1.3.5
30.	Un-install or Delete only part of the software.	1	inf1.1.1.15
31.	Un-install a software completely using the uninstallation process.	2	inf1.1.2.10

Sub Strand 1.2: Digital Media Concepts

Key Learning Outcome (Inf1.2):

Students are able to demonstrate an understanding of key digital media concepts and digital media tools.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Define digital media.	1	inf1.2.1.1
2.	Name a type of digital media	1	inf1.2.1.2
3.	Outline the types of digital media	2	inf1.2.2.1
4.	Name a specific use of digital media	1	inf1.2.1.3
5.	Outline specific uses of digital media	2	inf1.2.2.2
6.	Define graphics card.	1	inf1.2.1.4
7.	State an element of good graphic design.	1	inf1.2.1.5
8.	List the elements of good graphic design.	2	inf1.2.2.3
9.	State the significance of using an appropriate graphics card.	1	inf1.2.1.6
10.	Outline the significance of using appropriate graphics cards.	2	inf1.2.2.4
11.	State an important feature of a graphics card.	1	inf1.2.1.7
12.	Describe the important features of a graphics card.	2	inf1.2.2.5
13.	State a key feature of a graphics design tool.	1	inf1.2.1.8
14.	Outline key features of a graphics design tool.	2	inf1.2.2.6
15.	State the importance of using an appropriate software for graphics design tasks.	1	inf1.2.1.9

16.	Outline the importance of using an appropriate software for graphics design tasks.	2	inf1.2.2.7
17.	Explain the importance of using an appropriate software for graphics design tasks.	3	inf1.2.3.1
18.	Discuss the importance of using an appropriate software for graphics design tasks.	4	inf1.2.4.1
19.	Identify a specific task that requires the use of graphics design software.	1	inf1.2.1.10
20.	Outline specific tasks that require the use of graphics design software.	2	inf1.2.2.8
21.	Define animation.	1	inf1.2.1.11
22.	Identify an appropriate graphics software for designing an animated object.	1	inf1.2.1.12
23.	State an important part of the process used for designing an animated object.	1	inf1.2.1.13
24.	Outline the process used for designing an animated object.	2	inf1.2.2.9
25.	Explain the required process for designing and implementing an animated object.	3	inf1.2.3.2
26.	State a key requirement for a specific graphics design task.	1	inf1.2.1.14
27.	Outline key requirements for a specific graphics design task.	2	inf1.2.2.10
28.	Explain the importance of ascertaining the requirements for a specific graphics design task.	3	inf1.2.3.3
29.	Discuss the importance of ascertaining the requirements for a specific graphics design task.	4	inf1.2.4.2
30.	Define video peripherals.	1	inf1.2.1.15
31.	Name an appropriate video peripheral for a particular function.	1	inf1.2.1.16
32.	Outline appropriate video peripherals for a particular function.	2	inf1.2.2.11
33.	State a key function of a video peripheral	1	inf1.2.1.17
34.	Outline the functions of a video peripheral.	2	inf1.2.2.12
35.	State a key feature of a video processing software for developing a video file.	1	inf1.2.1.18
36.	Outline key features of a video processing software for developing video files.	2	inf1.2.2.13
37.	Explain the importance of the key features of a video processing software for developing video files.	3	inf1.2.3.4
38.	Discuss the importance of the key features of a video processing software for developing video files.	4	inf1.2.4.3
39.	State a key requirement for developing a video output.	1	inf1.2.1.19
40.	Outline key requirements for developing a video output.	2	inf1.2.2.14
41.	Explain the requirements for developing a video output.	3	inf1.2.3.5
42.	Discuss the requirements for developing a video output to meet a specific event	4	inf1.2.4.4
43.	Define audio peripherals.	1	inf1.2.1.20
44.	Name an appropriate audio peripheral for a particular event.	1	inf1.2.1.21
45.	Outline appropriate audio peripherals for a particular event.	2	inf1.2.2.15

46.	State a key function of an audio peripheral.	1	inf1.2.1.22
47.	Outline the functions of an audio peripheral.	2	inf1.2.2.16
48.	State a key feature of audio processing software for developing an audio file.	1	inf1.2.1.23
49.	Outline the key features of audio processing software for developing audio files.	2	inf1.2.2.17
50.	Explain the importance of the key features of audio processing software for developing audio files.	3	inf1.2.3.6
51.	Discuss the importance of the features of audio processing software for developing audio files.	4	inf1.2.4.5
52.	State a key requirement for developing an audio output.	1	inf1.2.1.24
53.	Outline key requirements for developing an audio output.	2	inf1.2.2.18
54.	Explain the requirements for developing an audio output.	3	inf1.2.3.7
55	Discuss the requirement for developing an audio output to meet a specific event.	4	inf1.2.4.6

Sub Strand 1.3: Digital Media Design/ Processing

Key Learning Outcome (Inf1.3):

Students are able to demonstrate understanding and skills in designing and developing digital graphics, video and audio media output.

Specific Learning Outcomes (SLO):

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Open a saved graphics file.	1	inf1.3.1.1
2.	Create a new graphics file.	1	inf1.3.1.2
3.	Apply a specific graphics design feature on a created graphics item.	1	inf1.3.1.3
4.	Apply specific graphics design features on a created graphics item.	2	inf1.3.2.1
5.	Apply a specific graphics design feature on an existing graphics item.	1	inf1.3.1.4
6.	Apply specific graphics design features on an existing graphics item.	2	inf1.3.2.2
7.	Create a part of an animated task using a graphics design software	1	inf1.3.1.5
8.	Create the major components of an animated task using a graphics design software.	2	inf1.3.2.3
9.	Create a complete but a basic animated task using a graphics design software.	3	inf1.3.3.1
10.	Create a complete animated task using a graphics design software to meet a specific design requirement.	4	inf1.3.4.1
11.	Create a part of a graphics task using a graphics design software.	1	inf1.3.1.6
12.	Create the major components of a graphics task using a graphics design software.	2	inf1.3.2.4
13.	Create a complete graphics task using a graphics design software.	3	inf1.3.3.2

14.	Create a complete graphics task using a graphics design software to meet a specific graphics design requirement.	4	inf1.3.4.2
15.	Open a saved video file.	1	inf1.3.1.7
16.	Create a new video file.	1	inf1.3.1.8
17.	Apply a video processing feature on a created video.	1	inf1.3.1.9
18.	Apply video processing features on a created video.	2	inf1.3.2.5
19.	Apply advanced features of a video processing software on a created video.	3	inf1.3.3.3
20.	Apply a video processing feature on an existing video.	1	inf1.3.1.10
21.	Apply video processing features on an existing video.	2	inf1.3.2.6
22.	Apply advanced features of a video processing software on an existing video.	3	inf1.3.3.4
23.	Create a part of a video task using a video processing software.	1	inf1.3.1.11
24.	Create the major components of a video task using a video processing software.	2	inf1.3.2.7
25.	Create a complete video task using a video processing software.	3	inf1.3.3.5
26.	Create a complete video task [graphics, moving pictures & audio] using a video processing software to meet a specific requirement.	4	inf1.3.4.3
27.	Open a saved audio file.	1	inf1.3.1.12
28.	Create a new audio file.	1	inf1.3.1.13
29.	Apply an audio processing feature on a created audio.	1	inf1.3.1.14
30.	Apply audio processing features on a created audio.	2	inf1.3.2.8
31.	Apply advanced features of an audio processing software on a created audio.	3	inf1.3.3.6
32.	Apply an audio processing feature on an existing audio.	1	inf1.3.1.15
33.	Apply audio processing features on an existing audio.	2	inf1.3.2.9
34.	Apply advanced features of an audio processing software on an existing audio.	3	inf1.3.3.7
35.	Create a part of an audio task using an audio processing software.	1	inf1.3.1.16
36.	Create the major components of an audio task using an audio processing software.	2	inf1.3.2.10
37.	Create a complete audio task using an audio processing software.	3	inf1.3.3.8
38.	Create a complete audio task using an audio processing software to meet a specific requirement.	4	inf1.3.4.4

Strand 2: Website Development

Major Learning Outcome (Inf2):

Students are able to demonstrate an understanding of the key concepts of web development and the use of web driven databases.

Sub Strand 2.1: Web Design

Key Learning Outcome (Inf2.1):

Students are able to demonstrate an understanding of web design concepts and website development with media objects.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Define website.	1	inf2.1.1.1
2.	State a key principle of good website design	1	inf2.1.1.2
3.	Outline the principles of good website design.	2	inf2.1.2.1
4.	Explain the importance of using the principles of good website design.	3	inf2.1.3.1
5.	Identify a key web design requirement for an organisation.	1	inf2.1.1.3
6.	Outline key web design requirements for an organisation.	2	inf2.1.2.2
7.	Explain the importance of key web design requirements for an organisation.	3	inf2.1.3.2
8.	Discuss the importance of key web design requirements for an organisation.	4	inf2.1.4.1
9.	Define CSS.	1	inf2.1.1.4
10.	Define HTML.	1	inf2.1.1.5
11.	State an advantage of using CSS in developing websites.	1	inf2.1.1.6
12.	Outline key advantages of using CSS in developing websites.	2	inf2.1.2.3
13.	Explain the advantages of using CSS in developing websites.	3	inf2.1.3.3
14.	Create a web-page to present a text object using HTML codes.	1	inf2.1.1.7
15.	Create multiple web-pages presenting some text and graphics objects using HTML codes.	2	inf2.1.2.4
16.	Create multiple web-pages that are linked using HTML codes with correct hyperlinks to some media files [graphics or video or audio].	3	inf2.1.3.4
17.	Create multiple web-pages that are linked using HTML codes with correct hyperlinks to media files [graphics, audio & video] to meet specific requirements.	4	inf2.1.4.2
18.	Create a basic CSS file.	1	inf2.1.1.8
19.	Create a CSS file that correctly controls the style of a website.	2	inf2.1.2.5

20.	Test a web-page using a web browser to present the expected output.	1	inf2.1.1.9
21.	Test the entire website and all hyperlinks using a web browser to present the expected output.	2	inf2.1.2.6
22.	State an advantage of validating a website.	1	inf2.1.1.10
23.	Outline the advantages of validating websites.	2	inf2.1.2.7
24.	State a key part of the validation process of a website.	1	inf2.1.1.11
25.	Outline the steps involved in the validation process of websites.	2	inf2.1.2.8
26.	Validate a created web-page.	1	inf2.1.1.12
27.	Validate a created website [both HTML and CSS].	2	inf2.1.2.9

Sub Strand 2.2: Data base driven Website

Key Learning Outcome (Inf2.2):

Students are able to demonstrate understanding and skills in developing a database-driven website using available cross-platform web developing tools.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	State a key benefit of using a database-driven website.	1	inf2.2.1.1
2.	Outline the key benefits of using a database-driven website.	2	inf2.2.2.1
3.	Explain the key benefits of using a database-driven website for an organisation.	3	inf2.2.3.1
4.	Evaluate the visible benefits within an organisation from using a database-driven website.	4	inf2.2.4.1
5.	State a required component in developing a database-driven website.	1	inf2.2.1.2
6.	Outline the required components in developing a database-driven website.	2	inf2.2.2.2
7.	Explain the database-driven website concept.	3	inf2.2.3.2
8.	Discuss the interaction processes between a website and its purpose-built database.	4	inf2.2.4.2
9.	Create a single table database.	1	inf2.2.1.3
10.	Create a single table with multiple columns database to be used in conjunction with the website.	2	inf2.2.2.3
11.	Create a single table with multiple columns database that is used in conjunction with a web interface.	3	inf2.2.3.3
12.	Create a single table with multiple columns database that is used in conjunction with a created web interface to meet specific requirements.	4	inf2.2.4.3
13.	Enter data into the database.	1	inf2.2.1.4
14.	Enter data into the database using a created web interface.	2	inf2.2.2.4
15.	State a part of the process to test a web-driven database.	1	inf2.2.1.5

16.	Outline the process involved in testing a web-driven database.	2	inf2.2.2.5
17.	Test the web-driven database is returning accurate information.	1	inf2.2.1.6
18.	Test the web-driven database is returning all expected information to the website.	2	inf2.2.2.6

Strand 3: Programming

Major Learning Outcome (Inf3):

Students are able to demonstrate an understanding of programming concepts through the use of appropriate programming languages.

Sub Strand 3.1: Problem-Solving

Key Learning Outcome (Inf3.1):

Students are able to demonstrate an understanding of the problem-solving process in preparing for a programming project.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Define problem-solving.	1	inf3.1.1.1
2.	Identify a step in the problem-solving process.	1	inf3.1.1.2
3.	Outline the steps of the problem-solving process.	2	inf3.1.2.1
4.	Explain the problem-solving process.	3	inf3.1.3.1
5.	State a key benefit of using the problem-solving process.	1	inf3.1.1.3
6.	Outline key benefits of using the problem-solving process.	2	inf3.1.2.2
7.	Explain the benefits of using the problem-solving process.	3	inf3.1.3.2
8.	Discuss the benefits of using the problem-solving process.	4	inf3.1.4.1
9.	Identify a problem that requires a computer program solution.	1	inf3.1.1.4
10.	Decompose the problem into solvable components.	2	inf3.1.2.3
11.	State a single statement in plain English to present the solution for a major part of the problem.	1	inf3.1.1.5
12.	Describe the solution to a major part of the problem in plain English.	2	inf3.1.2.4
13.	Define top-down design approach.	1	inf3.1.1.6
14.	Define bottom-up design approach.	1	inf3.1.1.7
15.	State a benefit of the top-down approach.	1	inf3.1.1.8
16.	Outline the benefits of the top-down approach.	2	inf3.1.2.5
17.	Explain the benefits of the top-down approach.	3	inf3.1.3.3
18.	Evaluate the use of the top-down approach in programming.	4	inf3.1.4.2
19.	State a benefit of the bottom-up approach.	1	inf3.1.1.9

20.	Outline the benefits of the bottom-up approach.	2	inf3.1.2.6
21.	Explain the benefits of the bottom-up approach.	3	inf3.1.3.4
22.	Evaluate the use of the bottom-up approach in programming.	4	inf3.1.4.3
23.	State the effectiveness of top-down design tools in programming.	1	inf3.1.1.10
24.	Outline the effectiveness of top-down design tools in programming.	2	inf3.1.2.7
25.	Explain the effectiveness of top-down design tools in programming.	3	inf3.1.3.5
26.	State the effectiveness of bottom-up design tools in programming.	1	inf3.1.1.11
27.	Outline the effectiveness of bottom-up design tools in programming.	2	inf3.1.2.8
28.	Explain the effectiveness of bottom-up design tools in programming.	3	inf3.1.3.6

Sub Strand 3.2: Stages of Programming

Key Learning Outcome (Inf3.2):

Students are able to demonstrate competency in constructing a solution to a specific problem using design tools and the stages of programming.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Define computer program.	1	inf3.2.1.1
2.	Define programming language.	1	inf3.2.1.2
3.	State an example of a programming language.	1	inf3.2.1.3
4.	Define pseudocode.	1	inf3.2.1.4
5.	Define programming algorithm.	1	inf3.2.1.5
6.	Define flowchart.	1	inf3.2.1.6
7.	Define logic structure in programming.	1	inf3.2.1.7
8.	Identify an example of a pseudocode design rule.	1	inf3.2.1.8
9.	Identify a type of logic structure.	1	inf3.2.1.9
10.	Identify a flowchart design tool.	1	inf3.2.1.10
11.	List the types of logic structures.	2	inf3.2.2.1
12.	Write a pseudocode statement.	1	inf3.2.1.11
13.	Write pseudocode to present the solution to a problem using proper statements and conventions.	2	inf3.2.2.2
14.	Write a statement that can be part of an algorithm.	1	inf3.2.1.12
15.	Write a complete algorithm to present the solution to a problem.	2	inf3.2.2.3
16.	Present the basic component of a flowchart.	1	inf3.2.1.13

17.	Use a flowchart to present the flow of the solution to a problem.	2	inf3.2.2.4
18.	Produce a document that correctly presents the logic of the solution using either an algorithm or flowchart using acceptable conventions.	3	inf3.2.3.1
19.	Produce a document that correctly presents the logic of the solution using an algorithm and a flowchart using acceptable conventions.	4	inf3.2.4.1
20.	State an example of a pseudocode keyword.	1	inf3.2.1.14
21.	Outline examples of pseudocode keywords.	2	inf3.2.2.5
22.	State a known advantage of using a flowchart.	1	inf3.2.1.15
23.	Outline the known advantages of using flowcharts.	2	inf3.2.2.6
24.	State a key feature of a type of logic structure.	1	inf3.2.1.16
25.	Describe the features of a type of logic structure.	2	inf3.2.2.7
26.	Explain the use of pseudocode keywords.	3	inf3.2.3.2
27.	Explain the advantages of using flowcharts in programming.	3	inf3.2.3.3
28.	Explain the use of logic structures in programming.	3	inf3.2.3.4
29.	Name a major stage of programming.	1	inf3.2.1.17
30.	List the major stages of programming. [6 stages]	2	inf3.2.2.8
31.	Explain the benefits of using the stages of programming.	3	inf3.2.3.5
32.	Discuss the benefits of using the stages of programming.	4	inf3.2.4.2
33.	State a key feature of any of the stages of programming.	1	inf3.2.1.18
34.	Outline key features of any of the stages of programming.	2	inf3.2.2.9

Sub Strand 3.3: Coding

Key Learning Outcome (Inf3.3):

Students are able to demonstrate competency in coding by constructing a solution to an identified problem using a programming language and following established coding practices.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Define debugging.	1	inf3.3.1.1
2.	Define program testing.	1	inf3.3.1.2
3.	Identify a variable in a given program.	1	inf3.3.1.3
4.	Define a function.	1	inf3.3.1.4
5.	Define a datatype.	1	inf3.3.1.5
6.	Define indexed data structure.	1	inf3.3.1.6
7.	Define modular coding.	1	inf3.3.1.7

8.	Identify a program error.	1	inf3.3.1.8
9.	Declare a variable in coding.	1	inf3.3.1.9
10.	Declare appropriate variables.	2	inf3.3.2.1
11.	Use modular coding in a piece of code.	1	inf3.3.1.10
12.	Use modular coding practices correctly.	2	inf3.3.2.2
13.	Name a basic programming error.	1	inf3.3.1.11
14.	List the basic programming errors. [syntax, logic, semantic]	2	inf3.3.2.3
15.	Write a single comment in the code to clarify a piece of code.	1	inf3.3.1.12
16.	Write detailed comments in the code to clarify the purpose of a piece of code.	2	inf3.3.2.4
17.	Debug a simple program using a debugging tool.	1	inf3.3.1.13
18.	Debug a simple program using a debugging tool and make necessary corrections.	2	inf3.3.2.5
19.	Produce a part of a program solution.	1	inf3.3.1.14
20.	Produce a program solution with some coding elements applied.	2	inf3.3.2.6
21.	Produce a program solution with required coding elements using a programming tool.	3	inf3.3.3.1
22.	Produce required program solution with all required coding elements using a programming tool.	4	inf3.3.4.1
23.	Test the program for expected output.	1	inf3.3.1.15
24.	Test the program using systematic testing for expected output.	2	inf3.3.2.7
25.	Produce a required program solution following the modular coding concepts.	3	inf3.3.3.2
26.	State a part of the testing process.	1	inf3.3.1.16
27.	Outline the program testing process.	2	inf3.3.2.8
28.	Explain the benefits of program testing.	3	inf3.3.3.3
29.	Discuss the benefits of program testing.	4	inf3.3.4.2
30.	State a benefit of using design tools to design computer programs.	1	inf3.3.1.17
31.	Outline the benefits of using design tools to design computer programs.	2	inf3.3.2.9
32.	Explain the benefits of using design tools to design programs.	3	inf3.3.3.4
33.	Discuss the benefits of using design tools for designing programs. [Visio, LucidChart]	4	inf3.3.4.3

Strand 4: Microprocessor Control

Major Learning Outcome (Inf4):

Students are able to demonstrate an understanding of the principles of microprocessor control and the use of programmable microprocessors to control embedded devices.

Sub Strand 4.1: Programmable Microprocessor

Key Learning Outcome (Inf4.1):

Students are able to demonstrate an understanding of the concepts of microprocessors.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Define microprocessor.	1	inf4.1.1.1
2.	Define machine code.	1	inf4.1.1.2
3.	State a feature of a microprocessor.	1	inf4.1.1.3
4.	Outline the features of a microprocessor.	2	inf4.1.2.1
5.	State a component of the operation of a microprocessor.	1	inf4.1.1.4
6.	Describe the operation of a microprocessor in terms of input, processing, storage, and output.	2	inf4.1.2.2
7.	State a part of the interaction between processing and storage in the microprocessor.	1	inf4.1.1.5
8.	Describe the interaction between processing and storage in the microprocessor.	2	inf4.1.2.3
9.	Explain the interaction between processing and storage in the microprocessor.	3	inf4.1.3.1
10.	State a part of the process involved in converting high-level language to machine language.	1	inf4.1.1.6
11.	Describe the process involved in converting high-level language to machine language.	2	inf4.1.2.4
12.	Explain the process involved in converting high-level language to machine language.	3	inf4.1.3.2
13.	Discuss the process involved in converting high-level language to machine language.	4	inf4.1.4.1
14.	State a part of the process involved when a microprocessor controls the hardware.	1	inf4.1.1.7
15.	Outline the process involved when a microprocessor controls the hardware.	2	inf4.1.2.5
16.	Explain the process involved when a microprocessor controls the hardware.	3	inf4.1.3.3
17.	Discuss the process involved when a microprocessor controls the hardware.	4	inf4.1.4.2

Sub Strand 4.2: Embedded Devices

Key Learning Outcome (Inf4.2)

Students are able to demonstrate an understanding of the use of programmable microprocessors to control embedded devices to perform tasks.

Specific Learning Outcomes (SLO):

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Define embedded device.	1	inf4.2.1.1
2.	State an example of an embedded device.	1	inf4.2.1.2
3.	Define programmable microprocessors.	1	inf4.2.1.3
4.	State a feature of a programmable microprocessor.	1	inf4.2.1.4
5.	List the features of a programmable microprocessor.	2	inf4.2.2.1
6.	State a need for programmable microprocessors.	1	inf4.2.1.5
7.	Outline the need for programmable microprocessors.	2	inf4.2.2.2
8.	Explain the importance of programmable microprocessors.	3	inf4.2.3.1
9.	Identify a relevant task that a programmable microprocessor can be programmed to perform.	1	inf4.2.1.6
10.	Design a component of a flowchart.	1	inf4.2.1.7
11.	Design a flow chart to present the logical solution to the identified task.	2	inf4.2.2.3
12.	Produce a statement of a high-level code that is part of a program to control a programmable microprocessor.	1	inf4.2.1.8
13.	Produce a high-level program that can be used to control a programmable microprocessor.	2	inf4.2.2.4
14.	Produce a high-level program to make a programmable microprocessor to perform a simple task.	3	inf4.2.3.2
15.	Produce a high-level program for a programmable microprocessor to perform a specific task.	4	inf4.2.4.1
16.	State an important factor in having an error free software controlling an embedded device.	1	inf4.2.1.9
17.	Outline key factors in having an error free software controlling an embedded device.	2	inf4.2.2.5
18.	Explain the importance of having an error free software to control the embedded device.	3	inf4.2.3.3
19.	Discuss the importance of having an error free software to control the embedded device.	4	inf4.2.4.2
20.	Produce a statement of a high-level code that is part of a program to control a programmable microprocessor by responding to some physical changes.	1	inf4.2.1.10
21.	Produce a high-level program that can be used to instruct a programmable microprocessor to respond to some physical changes.	2	inf4.2.2.6
22.	Produce a high-level program instructing a programmable microprocessor to respond when a critical change in the physical	3	inf4.2.3.4

	environment is detected.		
23.	Produce a high-level program for a programmable microprocessor to respond with a specific output when a critical change in the physical environment is detected.	4	inf4.2.4.3
24.	State an example of suitable output response from a microprocessor when a critical change has occurred in its environment.	1	inf4.2.1.11
25.	Outline suitable output responses from a microprocessor when a critical change has occurred in its environment.	2	inf4.2.2.7
26.	State a required component that can be used by an embedded device to detect a change in its environment.	1	inf4.2.1.12
27.	Outline required components for an embedded device to detect a change in its environment and respond.	2	inf4.2.2.8
28.	Identify an appropriate example of a critical change in the physical environment of a specific embedded device.	1	inf4.2.1.13
29.	Outline common examples of a critical change in the physical environment of embedded devices.	2	inf4.2.2.9
30.	State a part of the process involved in controlling an embedded device to respond when a critical change in its environment occurs.	1	inf4.2.1.14
31.	Outline the process involved in controlling an embedded device to respond when a critical change in its environment occurs.	2	inf4.2.2.10
32.	Explain the process involved in controlling an embedded device to respond when a critical change in its environment occurs.	3	inf4.2.3.5
33.	Discuss the process involved in preparing a programmable microprocessor to control an embedded device to respond when a critical change in its environment occurs.	4	inf4.2.4.4

Strand 5: Issues in ICT

Major Learning Outcome (Inf5):

Students are able to demonstrate an understanding of the major concerns with the use of ICT and with important measures that can be used to minimize the concerns or provide some level of safety and security.

Sub Strand 5.1: Ethical & Social Issues

Key Learning Outcome (Inf5.1):

Students are able to demonstrate an understanding of ethical and social issues in relation to the use of ICT.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	State an ethical concern in ICT.	1	inf5.1.1.1
2.	Outline ethical concerns in ICT.	2	inf5.1.2.1
3.	Explain the ethical concerns in ICT.	3	inf5.1.3.1
4.	Discuss the ethical and social concerns in ICT	4	inf5.1.4.1
5.	Define piracy.	1	inf5.1.1.2
6.	Define privacy.	1	inf5.1.1.3
7.	Define copyright.	1	inf5.1.1.4
8.	Define plagiarism.	1	inf5.1.1.5
9.	Define Identity theft.	1	inf5.1.1.6
10.	Define corporate confidentiality.	1	inf5.1.1.7
11.	State an ethical concern with piracy.	1	inf5.1.1.8
12.	State an ethical concern with privacy.	1	inf5.1.1.9
13.	State an ethical concern with copyright.	1	inf5.1.1.10
14.	State an ethical concern with plagiarism.	1	inf5.1.1.11
15.	State an ethical concern with identity theft.	1	inf5.1.1.12
16.	State an ethical concern with corporate confidentiality.	1	inf5.1.1.13
17.	Outline the ethical concerns with piracy.	2	inf5.1.2.2
18.	Outline the ethical concerns with privacy.	2	inf5.1.2.3
19.	Outline the ethical concerns with copyright.	2	inf5.1.2.4
20.	Outline the ethical concerns with plagiarism.	2	inf5.1.2.5
21.	Outline the ethical concerns with identity theft.	2	inf5.1.2.6
22.	Outline the ethical concerns with corporate confidentiality.	2	inf5.1.2.7
23.	Identify known legislation that is used by countries to minimise ethical concerns.	1	inf5.1.1.14

24.	Outline know legislations that are used by countries to minimise ethical concerns.	2	inf5.1.2.8
25.	State a known impact of ethical issues in ICT.	1	inf5.1.1.15
26.	Outline the known impacts of ethical issues in ICT.	2	inf5.1.2.9
27.	Explain the impacts of the ethical issues in ICT.	3	inf5.1.3.2
28.	Discuss the impacts of ethical issues in ICT.	4	inf5.1.4.2
29.	State an appropriate measure that can be used to minimise the effect of ethical concerns in ICT.	1	inf5.1.1.16
30.	Outline appropriate measures that can be used to minimise the effect of ethical concerns in ICT.	2	inf5.1.2.10
31.	Explain appropriate measures that can be used to minimise the effect of ethical concerns in ICT.	3	inf5.1.3.3
32.	Discuss appropriate measures that can be used to minimise the effect of ethical concerns in ICT.	4	inf5.1.4.3

Sub Strand 5.2: Environmental Issues

Key Learning Outcome (Inf5.2):

Students are able to demonstrate an understanding of the environmental issues with the increasing use of ICT.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	State an environmental concern caused by the growing use of ICT.	1	inf5.2.1.1
2.	Outline environmental concerns caused by the growing use of ICT.	2	inf5.2.2.1
3.	Explain the environmental concerns caused by the growing use of ICT.	3	inf5.2.3.1
4.	Discuss the environmental concerns caused by the growing use of ICT.	4	inf5.2.4.1
5.	State an issue with the dumping of ICT waste in landfills.	1	inf5.2.1.2
6.	Outline the issues caused by dumping ICT waste in landfills.	2	inf5.2.2.2
7.	State an issue with the burning of ICT waste.	1	inf5.2.1.3
8.	Outline the issues caused by the burning of ICT waste.	2	inf5.2.2.3
9.	State a known challenge faced by Pacific Island Countries in addressing the environmental concerns associated with ICT.	1	inf5.2.1.4
10.	Outline the known challenges faced by Pacific Island Countries in addressing the environmental concerns associated with ICT.	2	inf5.2.2.4
11.	Explain the challenges faced by Pacific Island Countries in addressing the environmental concerns associated with ICT.	3	inf5.2.3.2
12.	Discuss the known challenges faced by Pacific Island Countries in addressing the environmental concerns associated with ICT.	4	inf5.2.4.2
13.	State a cause leading to climate change as an effect of the increasing electricity demand for ICT.	1	inf5.2.1.5

14.	Outline the causes leading to climate change as an effect of the increasing electricity demand for ICT.	2	inf5.2.2.5
15.	Explain the causes leading to climate change as an effect of the increasing electricity demand for ICT.	3	inf5.2.3.3
16.	Discuss the causes leading to climate change as an effect of the increasing electricity demand for ICT.	4	inf5.2.4.3
17.	State a known option for managing ICT waste.	1	inf5.2.1.6
18.	Outline known options for managing ICT waste.	2	inf5.2.2.6
19.	Explain effective ways of managing ICT waste.	3	inf5.2.3.4
20.	Discuss effective ways of managing ICT waste.	4	inf5.2.4.4
21.	Identify an option for organisations to consider in addressing the heavy usage of electricity by ICT.	1	inf5.2.1.7
22.	Outline various options for organisations to consider in addressing the heavy usage of electricity by ICT.	2	inf5.2.2.7
23.	Explain the options for organisations to consider in addressing the heavy usage of electricity by ICT.	3	inf5.2.3.5
24.	Evaluate the options for organisations to consider in addressing the heavy usage of electricity by ICT.	4	inf5.2.4.5
25.	State an effective way that technology can be used to address environmental concerns associated with ICT.	1	inf5.2.1.8
26.	Outline some of the effective ways that technology can be used to address environmental concerns associated with ICT.	2	inf5.2.2.8
27.	Explain effective ways that technology can be used to address environmental concerns associated with ICT.	3	inf5.2.3.6
28.	Discuss effective ways that technology can be used to address environmental concerns associated with ICT.	4	inf5.2.4.6
29.	Define sustainable technology.	1	inf5.2.1.9
30.	State an example of sustainable technology.	1	inf5.2.1.10
31.	Outline examples of sustainable technologies.	2	inf5.2.2.9
32.	State a part of an effective approach in creating a sustainable ICT industry.	1	inf5.2.1.11
33.	Outline some components of an effective approach in creating a sustainable ICT industry.	2	inf5.2.2.10
34.	Explain an effective approach in creating a sustainable ICT industry.	3	inf5.2.3.7
35.	Discuss an effective approach in creating a sustainable ICT industry.	4	inf5.2.4.7

Sub Strand 5.3: Health Issues

Key Learning Outcome (Inf5.3):

Students are able to demonstrate an understanding of health issues related to using ICT equipment.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	State a known health issue directly related to using ICT equipment.	1	inf5.3.1.1
2.	Outline health issues directly related to using ICT equipment.	2	inf5.3.2.1
3.	Explain health issues directly related to using ICT equipment.	3	inf5.3.3.1
4.	Discuss health issues directly related to using ICT equipment.	4	inf5.3.4.1
5.	State an impact of the health issues associated with the use of ICT to an organisation.	1	inf5.3.1.2
6.	Outline the impact of the health issues associated with the use of ICT to an organisation.	2	inf5.3.2.2
7.	Explain the impact of the health issues associated with the use of ICT to an organisation.	3	inf5.3.3.2
8.	Discuss the impact of the health issues associated with the use of ICT to an organisation.	4	inf5.3.4.2
9.	Identify the best operating practice when interacting with ICT.	1	inf5.3.1.3
10.	Describe the best operating practices when interacting with ICT.	2	inf5.3.2.3
11.	Explain the best operating practices when interacting with ICT.	3	inf5.3.3.3
12.	Suggest the best operating practices when interacting with ICT.	4	inf5.3.4.3

Sub Strand 5.4: Safety & Security InIct

Key Learning Outcome (Inf5.4):

Students are able to demonstrate an understanding of safety and security in ICT.

Specific Learning Outcomes (SLO)

SLO #	Specific Learning Outcomes (SLO): <i>Students are able to</i>	SKILL LEVEL	SLO CODE
1.	Identify a computer safety or security concern in ICT.	1	inf5.4.1.1
2.	Outline computer safety or security concerns in ICT.	2	inf5.4.2.1
3.	Define cybersecurity.	1	inf5.4.1.2
4.	Define cyber-crimes.	1	inf5.4.1.3
5.	Identify a growing cybersecurity concern in ICT.	1	inf5.4.1.4
6.	Outline growing cybersecurity concerns in ICT.	2	inf5.4.2.2
7.	State a security threat posed by computer viruses.	1	inf5.4.1.5

8.	State a security threat posed by hackers.	1	inf5.4.1.6
9.	State a security threat posed by crackers.	1	inf5.4.1.7
10.	State a security threat posed by terrorists or organised crimes.	1	inf5.4.1.8
11.	State a security threat posed by employees.	1	inf5.4.1.9
12.	Outline security threats posed by computer viruses.	2	inf5.4.2.3
13.	Outline security threats posed by hackers.	2	inf5.4.2.4
14.	Outline security threats posed by crackers.	2	inf5.4.2.5
15.	Outline security threats posed by terrorists or organised crimes.	2	inf5.4.2.6
16.	Outline security threats posed by employees.	2	inf5.4.2.7
17.	State a known issue of having an online identity in a social media context.	1	inf5.4.1.10
18.	Outline known issues of having an online identity in a social media context.	2	inf5.4.2.8
19.	Explain known issues of having an online identity in a social media context.	3	inf5.4.3.1
20.	Discuss the implications of having an online identity in a social media context.	4	inf5.4.4.1
21.	Name a type of computer security.	1	inf5.4.1.11
22.	List the different types of computer security.	2	inf5.4.2.9
23.	State a key feature of a particular type of computer security.	1	inf5.4.1.12
24.	Outline the key features of a particular type of computer security.	2	inf5.4.2.10
25.	Name a type of physical security.	1	inf5.4.1.13
26.	List the different types of physical security.	2	inf5.4.2.11
27.	State a key feature of a particular type of physical security.	1	inf5.4.1.14
28.	Outline the key features of a particular type of physical security.	2	inf5.4.2.12
29.	Name a type of cybersecurity.	1	inf5.4.1.15
30.	List the different types of cybersecurity.	2	inf5.4.2.13
31.	State a key feature of a particular type of cybersecurity.	1	inf5.4.1.16
32.	Outline key features of a particular type of cybersecurity.	2	inf5.4.2.14
33.	Define cyber legislation.	1	inf5.4.1.17
34.	State a major component of cyber legislation.	1	inf5.4.1.18
35.	Outline major components of cyber legislation.	2	inf5.4.2.15
36.	State a major goal of specific cyber legislation.	1	inf5.4.1.19
37.	Outline the major goals of specific cyber legislation.	2	inf5.4.2.16
38.	Explain the major goals of specific cyber legislation.	3	inf5.4.3.2
39.	Discuss the major goals of specific cyber legislations.	4	inf5.4.4.2
40.	State a part of a plan to ensure computer security.	1	inf5.4.1.20
41.	Outline the main components of a plan to ensure computer security.	2	inf5.4.2.17

42.	Explain the main components of a plan to ensure computer security.	3	inf5.4.3.3
43.	Discuss the main components of a plan to ensure computer security.	4	inf5.4.4.3
44.	Identify a known ICT security incident reported in the Pacific.	1	inf5.4.1.21
45.	Outline known security incidents reported in the Pacific.	2	inf5.4.2.18
46.	Identify a known effort being implemented in the Pacific to combat cybercrimes.	1	inf5.4.1.22
47.	Outline known efforts being implemented in the Pacific to combat cybercrimes.	2	inf5.4.2.19
48.	Explain known efforts being implemented in the Pacific to combat cybercrimes.	3	inf5.4.3.4
49.	Discuss known efforts being implemented in the Pacific to combat cybercrimes.	4	inf5.4.4.4
50.	Identify a key challenge that affects the Pacific in their efforts to combat cybercrimes.	1	inf5.4.1.23
51.	Outline key challenges that affect the Pacific in their efforts to combat cybercrimes.	2	inf5.4.2.20
52.	Explain key challenges that affect the Pacific in their efforts to combat cybercrimes.	3	inf5.4.3.5
53.	Discuss key challenges that affect the Pacific in their efforts to combat cybercrimes.	4	inf5.4.4.5
54.	Define Intellectual property.	1	inf5.4.1.24
55.	Identify a known security concern associated with the protection of intellectual property in ICT.	1	inf5.4.1.25
56.	Outline known security concerns associated with the protection of intellectual property in ICT.	2	inf5.4.2.21
57.	Explain known security concerns associated with the protection of intellectual property in ICT.	3	inf5.4.3.6
58.	Discuss known security concerns associated with the protection of intellectual property in ICT.	4	inf5.4.4.6
59.	State a security concern associated with long term storage of personal information.	1	inf5.4.1.26
60.	Outline the security concerns associated with long term storage of personal information.	2	inf5.4.2.22
61.	Explain the security concerns associated with long term storage of personal information.	3	inf5.4.3.7
62.	Discuss the security concern associated with long term storage of personal information.	4	inf5.4.4.7

8. ASSESSMENT

The assessment of the syllabus is in two parts (external and internal assessment).

1. External assessment (EA): 60%
2. Internal assessment (IA): 40%

The principal, or principal's nominee, will certify that the syllabus requirements have been fulfilled.

8.1 External Assessment (60%)

A three hour written paper will examine this syllabus. The weightings given to each topic within the examination will be approximately:

OUTCOMES	WEIGHTING
Digital Media	12
Website Development	10
Programming	12
Microprocessor Control	6
Issues in ICT	20
Total	60%

Candidates may be required to apply knowledge, understanding and acquired skills to unfamiliar situations.

8.2 Internal Assessment (40%)

There are three tasks that make up the internal assessment component. They are practical components in ICT that require a demonstrated skill or a synthesised output.

PRACTICAL COMPONENT OF ICT	WEIGHTING
1. Digital Media & Website Development	20%
2. Programming	10%
3. Microprocessor Control	10%
Total	40

8.3 Assessment Blueprint

Strand	Assessment Type	SKILL LEVEL/ SCORE				Weight
		1	2	3	4	
1. Digital Media	EA					12
2. Website Development	EA					10
	IA	1	3	3	1	20
3. Programming	EA					12
	IA		3		1	10
4. Microprocessor Control	EA					6
	IA	1	1	1	1	10
5. Issues in ICT	EA					20
Total items for	IA	2	7	4	3	
Total items for	EA	1	8	6	2	
Total number of items		2	1	1	5	
Total skill score		0	3	3	2	100

8.4 Task 1 Instruction: Website Development & Media Production Project

Title: Website & Media Production Project
Strand 1 & Strand 2: Digital Media & Website Development
SLOs assessed for IA Task 1: inf1.1.1.8, inf1.1.2.7, inf2.1.2.6, inf2.2.2.6, inf1.3.3.2, inf1.3.3.5, inf2.2.3.3, inf2.1.4.2
<p>Students will</p> <ol style="list-style-type: none"> Identify and install open-source software from the Internet that can be used to process media files. Use digital media applications to create original media files (graphics, video and audio) to be used on a website; The media output must have visible use of media applications to manipulate media objects. Create a website (at least 3 web pages) using HTML codes with hyperlinks to all created media files. A CSS file is created to control the style of the website. Create a simple web-driven database that can update and retrieve data from the website. Save all required files with a summary report to present the media production output. Hand into the teacher the report and saved copies of the web files with media files and required database.

8.5 Task 1 Scoring Rubric

IA Task 1: Digital Media and Website Development

	SLO	SKILL LEVEL	EVIDENCE	STUDENT RESPONSE LEVEL			
				Level 1	Level 2	Level 3	Level 4
A1a	inf1.1.1.8	1	Identify an Open Source media application on the Internet.	An open source media application was identified			
A1b	inf1.1.1.12	1	Download an Open Source media application.	An open source media application was downloaded			
A1c	inf1.1.2.7	2	Prepare and install an Open Source media application.	Part of the software was installed	An open source media application was installed properly		
A1d	inf1.3.3.2	3	Create a complete graphics task using a graphics design software.	A part of a graphics task was created using a graphics design software was presented.	Major components of a graphics task was created using a graphics design software was presented.	A completed graphics task was created using a graphics design software was presented.	
A1e	inf1.3.3.5	3	Create a complete video task using a video processing software.	A part of a video task was created using a video processing software was presented.	Major components of a video task was created using a video processing software was presented.	A completed video task was created using a video processing software was presented.	
A1f	inf1.3.3.8	3	Create a complete audio task using an audio processing software.	A part of an audio task was created using an audio processing design software was presented.	Major components of an audio task was created using an audio processing software was presented.	A completed audio task was created using an audio processing software was presented.	
B1a	inf2.1.4.2	4	Create at least 3 web-pages that are linked using HTML codes with correct hyperlinks to media files [graphics, audio & video] to meet a specific requirements.	A web-page with a text object using HTML codes was presented.	Multiple web-pages with some text and graphics objects using HTML codes were presented.	Multiple web-pages that are linked using HTML codes with correct hyperlinks to some media files [graphics or video or audio] was presented.	At least 3 web-pages that are linked using HTML codes with correct hyperlinks to all required media files was presented.
B1b	inf2.1.2.6	2	Create a CSS file that correctly controls the style of a website.	A basic CSS file was presented but does not control the entire website.	A CSS file was created and correctly controls the style of the entire website.		

B1c	inf2.1.2.7	2	Test the entire website and all hyperlinks using a web browser to present the expected output.	A web-page was tested using a web browser and presented the expected output.	The entire website was tested using a web browser and presented the expected output.		
B1d	inf2.2.3.3	3	Create a single table with multiple columns database that is used in conjunction with a web interface.	A single database table was created.	A single table with multiple columns database to be used in conjunction with the website was created.	A single table with multiple columns database that is used in conjunction with a web interface was created.	
B1e	inf2.2.2.4	2	Enter data into the database using a created web interface.	Some data was entered into a stand-alone database.	Data were entered correctly to the database using a web interface.		
B1f	inf2.2.2.6	2	Test the web driven database is returning expected information to the website.	The web-driven database is returning an accurate information.	The web driven database is returning all the expected information to the website.		

8.6 Task 2 Instruction: Programming Project

Title: Programming Project
Strand 3: Programming
SLOs assessed for IA Task 2: inf3.2.2.4, inf3.3.2.2, inf3.3.2.4, inf3.3.4.1
Note: This is not a basic programming task; students are expected to write a program solution to perform a task. An example can be “a program to calculate net salaries according to gross salaries and corresponding tax rates (account for tax calculation and other possible deductions) of employees working for an organisation”.
<p>Students will:</p> <ol style="list-style-type: none"> a. Identify a problem that requires a program solution [with the help of the teacher]; b. Decompose the problem into main components; c. Express the solution to the problems using pseudocode; d. Express the logic of the program using a flowchart; e. Code the program using current practices <ul style="list-style-type: none"> • Modular • Declaring of variables • Using Control structures • Comments f. Test the code to show that it is working accurately; g. Document all the stages of the task. h. Save the program and a report showing all the work carried out in this project; i. Hand into the teacher the saved copy of the program and the report

8.7 Task 2 Scoring Rubric

IA Task 2: Programming

	SLO	SKILL LEVEL	EVIDENCE	STUDENT RESPONSE LEVEL			
				Level 1	Level 2	Level 3	Level 4
C1a	inf3.1.1.4	1	Identify a problem that requires a computer program solution.	A problem that requires a computer program solution was identified.			
C1b	inf3.2.2.4	2	Use a flowchart to present the solution to a problem.	A component of a flowchart was presented.	A flowchart showing the logical flow of the solution was presented correctly.		
C1c	inf3.3.2.1	2	Declare appropriate variables.	A single variable was declared correctly in the program.	Multiple variables were declared correctly in the program.		
C1d	inf3.3.2.2	2	Use modular coding practices correctly.	Modular coding presented in a piece of the code in the program.	Modular coding was followed and presented correctly in the program.		
C1e	inf3.3.2.4	2	Write detailed comments in the code to clarify the purpose of a piece of code.	A single comment in the code was presented.	Detailed comments in the code to clarify the purpose of a piece of code was presented correctly.		
C1f	inf3.3.2.5	2	Debug a simple program using a debugging tool and make necessary corrections.	A debugging tool was used on the program.	A debugging tool was used on the program, and the necessary corrections were made.		
C1g	inf3.3.4.1	4	Produce required program solution with all required coding elements using a programming tool.	A part of the program solution was provided.	A program was presented with some coding elements but does not produce the required solution.	A program with all required coding elements using a programming tool was produced but met only part or not all the required solution.	A program with all required coding elements using a programming tool produced the required solution.
C1h	inf3.3.2.7	2	Test the program using systematic testing for expected output.	A form of test was applied on the program.	Program was tested systematically.		

8.8 Task 3 Instruction: Microprocessor Control Project

Title: Microprocessor Control Project

Strand 4: Microprocessor Control

SLOs assessed for IA Task 3: inf4.2.1.13, inf4.2.2.3, inf4.2.3.4, inf4.2.4.1

Note: This task requires the use of a microprocessor kit that can be purchased from electronic shops. There should be enough kits for students to use and work with perhaps in pairs.

Students will:

- a. Use a microprocessor kit to meet the requirement of the task;
- b. Identify an appropriate task that requires a programmable microprocessor to perform;
- c. Design a flowchart to present the logic of the task to be performed;
- d. Write a high-level code to manipulate a microprocessor to perform a simple task;
- e. Identify an example of physical change that can affect an embedded device to respond
- f. Write a high-level code to manipulate a microprocessor to respond to a change in the physical environment of the embedded device;
- g. Capture the work on a video for confirmation of completed task;
- h. Hand into the teacher the saved copy of the program and proof of a working microprocessor.

8.9 Task 3 Scoring Rubric

Microprocessor Control

	SLO	SKILL LEVEL	EVIDENCE	STUDENT RESPONSE LEVEL			
				Level 1	Level 2	Level 3	Level 4
D1b	inf4.2.1.6	1	Identify a relevant task that a programmable microprocessor can be programmed to perform.	A relevant task that a programmable microprocessor can be programmed to perform was identified.			
D1c	inf4.2.2.3	2	Design a flow chart to present the logical solution to the identified task.	A component of a flow chart was presented.	A flowchart showing the logical solution for the task was presented correctly.		
D1d	inf4.2.4.1	4	Produce a high level program for a programmable microprocessor to perform a specific task.	A statement of a high-level code that is part of a program for a programmable microprocessor was presented.	A high-level program that can be used to control a programmable microprocessor was presented.	A high-level program that correctly control a programmable microprocessor to perform a simple task was presented.	A high-level program for a programmable microprocessor to perform a specific task was presented.
D1e	inf4.2.1.13	1	Identify an appropriate example of a critical change in the physical environment of a specific embedded device.	An appropriate example of a critical change in the physical environment of a specific embedded device was identified.			
D1f	inf4.2.3.4	3	Produce a high level program instructing a programmable microprocessor to respond when a critical change in the physical environment is detected.	A statement of a high level code that is part of a program to control a programmable microprocessor by responding to some physical changes was provided.	A high level program that can be used to instruct a programmable microprocessor to respond to some physical changes was presented.	A high level program instructing a programmable microprocessor to respond when a critical change in the physical environment is detected was presented correctly.	

8.10 Full IA Programme Proposal Template

Page 1: COVER PAGE

For example:

<p style="text-align: center;">MOTUFOUA SEC SCHOOL SPFSC 2020</p> <p style="text-align: center;">BIOLOGY: FULL IA PROGRAM</p> <p style="text-align: right;">Name:</p>

Page 2: INSERT IA SUMMARY FORM HERE

(To be completed, signed/school stamped/scan/insert)

Pages 3-12:

1. Task title: Task 1: _____

The title should be brief and include a reference to the particular syllabus topic or skill which is being assessed by the task.

Example: "Research Topic – Investigation of a Social Issue."

2. Learning Outcomes: List the Specific Learning Outcomes (SLOs) to be assessed by the task

These are found in the syllabus and need to be identified before the tasks are constructed.

Example: Describe a feature of

(Copy and paste the relevant IA SLOs directly from the Syllabus: show strand, sub strand and SLOs)

3. Assessment/Task:

Describe the task as a form of assessment to measure student achievements of the above learning outcomes at different stages of the lesson/task implementation.

(Think of what are the best types of assessment for the above LOs so that your students can demonstrate they have achieved the learning outcomes. Also include how you will pre-assess their knowledge at the beginning of the lesson and how you will continuously assess them throughout the strand/topic to monitor their learning progress. The summative assessments are the final IA tasks.)

e.g. Diagnostic: (can be oral questions/short tests/ surveys/questionnaires to find out what students already know before the lesson)

Formative: 1. This is the formative use of the summative assessment such as the drafts submitted, self-assessment, peer assessment, teacher assessment of the drafts and specific feedback provided to improve the task. 2. For CATs – this can be similar items prepared by

teachers using the SLOs and given to students for practice. After scoring, the feedback needs to be given to improve learning. If majority students are not doing well then re-teach using another strategy, assess and monitor learning.

Summative: (these are the final IA tasks or the CATs to measure how much the students have learnt/achieved after the learning period)

4. Resources: List materials required for completing the task (for learning & demonstrating the achievement of the SLOs.

This must specify any material items such as books, documents, maps, stimulus material, equipment required by the task, including use of technology and chemicals.

5. Guidelines for the teacher on advance preparation requirements

- a) **time required** by the student for task completion (monitoring progress)
- b) recommended dates/date range for task completion
- c) organization of room/lab and hardware to facilitate task completion.

(After the task has been completed and scored, teachers will need an IA score capture sheet to record the performance of all students in the class.)

6. Guidelines for the teacher on task completion and task control

This must specify:

- the role of the teacher during the period of task completion
- instructions that are to be given by the teacher to the students
- actions that are required of the teacher during task completion

7. Preparation by the students beforehand

If students are required to prepare in advance of the task date, preparatory notes must indicate the requirements. For example, students may need to collect support materials for a task that is supervised in a classroom.

8. Task outline for the student

This outline is a brief description of the task that the student is to complete. It is a general description without specific detail.

Example: Your task is to focus on an important social issue. After investigating that issue, you need to process information collected and suggest possible courses of action that authorities could take.

9. Task detail for the student

This must provide a detailed description of the task in the sequence that the student would be expected to follow during task completion. This must clearly state:

- what the student is expected to do
- what the student is expected to record and present for assessment.

(NB: Task details can be extracted from the Syllabus)

10. Feedback & Support

Using calendar days, allocate time for:

- i. Student’s self-assessment and correction
- ii. Peer assessment, feedback, and time for improvement
- iii. Teacher assessment, feedback, and time for time improvement

(NB: Provide week/dates, and state how the above will be carried out)

11. Final submission & scoring

State when the final task is due and how it will be assessed. State how the school (HOD/SPFSC Coordinator) will monitor the scoring of the tasks.

12. Assessment Schedule/ Scoring Rubric

Copy and paste directly from the aligned Syllabus the relevant scoring rubrics

13. Assessment score capture sheet for the task

Provided by EQAP when the task is due.

(Repeat 1-13 for other tasks)

8.11 IA Summary Form

South Pacific Form Seven Certificate

IA Summary Form

INFORMATION AND COMMUNICATIONS TECHNOLOGY

Country: _____ School: _____

Task	Brief Description of tasks	Start Date	End Date	Weight
1. Website Development & Media Production				20%
2. Programming				10%
3. Microprocessor Control				10%
TOTAL				40%

- Note:**
1. Be specific about dates, not just Week 3 Term 1, etc.
 2. Assessment schedules for the tasks are provided in the syllabus. Teachers must use these.
 3. All IA Score Capture Sheets will be provided by EQAP to schools.

Teacher's Name and Signature: Date:

Principal's Name and Signature: Date:

A full IA program is to be submitted together with this IA Summary Form.

9. APPENDICES

Appendix 1: Suggested Teaching Times and Weightings

	OUTCOMES	EXTERNAL / INTERNAL	SUGGESTED TIME	WEIGHTING
1	Digital Media	External	4 weeks	12%
2	Website Development Website & Media Production Project	External Internal	3 weeks 6 weeks	10% 20%
3	Programming Programming Project	External Internal	4 weeks 5 weeks	12% 10%
4	Microprocessor Control Microprocessor Control Project	External Internal	2 weeks 3 weeks	6% 10%
5	Issues in ICT	External	5 weeks	20%
	Total		32 weeks	100%

Appendix 2: Web-Based Resources

1. <http://csunplugged.org/> Computer Science resources which don't require a computer.
2. Free online courses – many specialist subject areas
http://ww2.openculture.com/computer_science_free_courses
3. HTML and CSS online tutorials <http://www.w3schools.com>
4. Python tutorials https://opentechschool.github.io/python-beginners/en/getting_started.html
5. Java tutorials <https://howtoprogramwithjava.com/programming-101-the-5-basic-concepts-of-any-programming-language/>
6. GIMP tutorials <https://www.gimp.org/tutorials/>

Appendix 3: Text Resources

1. **Year 12 Programming and Problem Solving**, Student Workbook in Python, Garner & Robins University of Otago
2. **The Non-Designer's Design Book**, Robin Williams.
<http://www.amazon.com/NonDesigners-Design-Book-Robin-Williams/dp/0321193857>. This book covers the basics of good graphical page design.

10. ADVISORY SECTION

10.1 Integration with other studies

ICT is a large area of study in its own right. It is also a technology that is used extensively in non-technical ways. Students are encouraged to use their ICT skills to further their studies in other subjects. If another subject's requirements can be fulfilled while simultaneously completing the requirements of the ICT course, then students should be encouraged to pursue this integration process.

10.2 Resources

Open Source and Proprietary Software

- a. Where possible students should be able to locate and download reputable open source software.
- b. Students should gain practical experience of using different applications which are designed to perform similar tasks so they can critically evaluate the software.

Media production

- a. Students must create their own graphic, video, and audio files. Students must realise
- b. they cannot use other artists' music, video, or photo or picture files.
- c. Animated .gif files can be created using Gimp.
- d. Animated .gif files can be created from individual .gif files, using UnFREEZ.
- e. Processing of the material must be at an advanced level. A professional output of at
- f. least 3 minutes duration is expected.

Website Design and Development

- a. Principles of good web page design are found in Robin William's book "The
- b. Non-Designer's Design Book". [http://www.amazon.com/Non-Designers-](http://www.amazon.com/Non-Designers-Design-Book-Robin-Williams/dp/0321193857)
- c. [Design-Book-Robin-Williams/dp/0321193857](http://www.amazon.com/Non-Designers-Design-Book-Robin-Williams/dp/0321193857)
- d. The HTML and CSS code must be constructed using a text editor. This ensures
- e. students understand the significance of each line of code in HTML and CSS.
- f. Suitable text editors are Notepad++, SciTE, and GNU Emacs. Other editors can be
- g. researched at <http://sixrevisions.com/tools/12-excellent-free-texteditors-for-coders/>
- h. Suitable code validators can be found at
- i. http://www.w3schools.com/web/web_validate.asp

Programming

- a. Any programming language may be used provided it allows indexed data structures.
- b. Students are expected to use a suitable editor which gives a Command Line Interface
- c. (CLI) to create code.
- d. The teacher may give any problem as their Internal Assessment task, to the students
- e. to solve, provided it is not trivial, and it allows the use of modular programming and at least one indexed data structure.
- f. Students' coding is expected to follow accepted current practice.
 - i. Modular
 - ii. Use of loops
 - iii. Use of decision structures

- iv. Use of variables
- v. Complete avoidance of Go To statements or equivalents.
- g. Python3 is recommended as a language because it forces the use of good
- h. programming practice. See <http://www.python.org/>
- i. Python has an extension, called Turtle, which allows for immediate visual feedback.
- j. To enhance engagement of the learner this type of approach is encouraged.
- k. Python can be downloaded at <http://www.python.org/>
- l. Python turtle can be downloaded at <http://pythonturtle.org/>
- m. Students who wish to go a lot further with programming may be interested in
- n. Pygame. This can be investigated at <http://www.pygame.org/download.shtml>

Microprocessor Control

- a. An easy to program, readily available, and reasonably priced microprocessor is the
- b. Picaxe08M2 chip. Other microprocessors include Arduino, and Raspberry Pi. There are more specialised microprocessors available. A web search will produce information about them.
- c. The software needed to program the picaxe microprocessor can be downloaded at
- d. <http://www.picaxe.com/Software/PICAXE/PICAXE-Programming-Editor/>
- e. To understand how a particular program behaves the simulation function of the
- f. software shows the state of each pin of the microprocessor.
- g. A manual and extensive help files come with the editor. Look in the Help menu.
- h. Environmental measurements may include light, temperature, noise, location,
- i. infra-red, and touch.
- j. A microprocessor must produce an output to show that it has responded to a change
- k. in its environment.
- l. Recorded data from the picaxe 08M2 can be exported to a spreadsheet, and then
- m. plotted as a graph.

Ethics of ICT, Environmental Practice, Safe Practice in ICT

- a. Phishing resource material is at <http://en.wikipedia.org/wiki/Phishing>
- b. Encryption resource material can be found at http://www.commoncriteriaportal.org/files/epfiles/st_vid3008-st.pdf

Project work

- a. Media
 - i. Graphics can be photos or computer generated art work or scanned drawings. All graphical material must be original and created by the student. This ensures ethical practice.
 - ii. Graphics can be processed in any software that has advanced features. The GIMP is recommended. It is an open source graphic design application available at www.gimp.org. A tutorial on the basic use of GIMP can be found at <https://www.gimp.org/tutorials/>. Paint.NET is also recommended and is available at <http://www.dotpdn.com/downloads/pdn.html> with on-line tutorials at <http://forums.getpaint.net/index.php?forum/18-tutorials-publishingonly/>
 - iii. Many phones have photo and video cameras incorporated. These can be used to create original material but the basis of the IA task is on how to use media application features to edit or processed media objects.

- iv. Video can be processed using any video editing software. A lot of open source video processing software are available on the Internet that can be downloaded. Windows Movie Maker is recommended and is included in Windows installations.
 - v. All videos must be original and created by the student.
 - vi. Audio can be processed using audio editing software. *Audacity* is recommended. It is available at <http://audacity.sourceforge.net/>
 - vii. All audio files must be original and created by the student.
- b. Website development
- i. PHP and MySQL are the desirable way to create a web driven database. PHP can be downloaded from <http://www.php.net/>
 - ii. A tutorial about PHP is at <http://www.php.net/tut.php>
 - iii. Students are not expected to set up a web server, but if they wish to do so then they should be encouraged to do it. The recommended way is to use XAMPP or create a LAMP server. The students who attempt this will learn a great deal. A LAMP server for windows can be found at <http://winlamp.sourceforge.net/> and XAMPP can be downloaded from <https://www.apachefriends.org/index.html>.
- c. Programming
- i. Students need to show good programming practice by:
 - 1. using a modular approach.
 - 2. including extensive comments in their code.
 - ii. Students should test each module of code as they proceed in the creation of their program. Testing the code while it is being built is a much easier way to correct mistakes than leaving it all to the end.

The End