



TECHNICAL &
VOCATIONAL
EDUCATION &
TRAINING

National Competency Standard for Programming

Qualifications Code: SOC30S18V1

PREFACE

Technical and Vocational Education and Training (TVET) Authority was established with the vision to develop a TVET system in the Maldives that is demand driven, accessible, beneficiary financed and quality assured, to meet the needs of society for stability and economic growth, the needs of Enterprise for a skilled and reliable workforce, the need of young people for decent jobs and the needs of workers for continuous mastery of new technology.

TVET system in the Maldives flourished with the Employment Skills Training Project (ESTP) funded by ADB with the objective of increasing the number of Maldivians, actively participating in the labor force, employed and self-employed. The Project supported expansion of demand driven employment-oriented skills training in priority occupations and to improve the capacity to develop and deliver Competency Based Skill Training (CBST). The project supported delivery of CBST programs to satisfy employer demand-driven needs.

Recognizing the importance of developing the youth sector to enable Maldives to transition from an upper-middle-income country to high-income country, the World Bank Country Partnership Framework (CPF) proposes to finance the Maldives Enhancing Employability and Resilience of Youth (MEERY) project. As part of the MEERY project is financing for skills development and entrepreneurship in priority sectors such as tourism, ICT and construction sector MEERY continues to provide support to TVET Authority to develop National Occupational Standard, instructional materials, assessment resource book and trainees log book for the National Occupational Standard for “Programming”. As part of the MEERY Project, TVET Authority has only undertaken to review standard which were developed in the ESTP Project to increase the economic opportunities for youth’s trainees and promote equitable economic & social development in the country.

The National Competency Standards (NCS) provide the base for this training. Currently CBST is offered for six key sectors in the Maldives: Tourism, Fisheries and Agriculture, Transport, Construction, Social and the Information and Technology sectors. These sectors are included as priority sectors that play a vital role in the continued economic growth of the country.

The NCS are developed in consultation with Employment Sector Councils representing employers. They are designed using a consensus format endorsed by the Maldives Qualifications Authority (MQA) to maintain uniformity of approach and the consistency of content amongst occupations. This single format also simplifies benchmarking the NCS against relevant regional and international standards. NCS specify the standards of performance of a competent worker and the various contexts in which the work may take place. NCS also describes the knowledge, skills and attitudes required in a particular occupation. They provide explicit advice to assessors and employers regarding the knowledge, skills and attitudes to be demonstrated by the candidates seeking formal recognition for the competency acquired following training or through work experience. By sharing this information, all participants in the training process have the same understanding of the training required and the standard to be reached for certification. Certification also becomes portable and can be recognized by other employers and in other countries with similar standards.

NCS are the foundation for the implementation of the TVET system in Maldives. They ensure that all skills, regardless of where or how they were developed can be assessed and recognized. They also form the foundation for certifying skills in the Maldives National Qualification Framework (MNQF).

NCS are developed by the Technical and Vocational and Education Training Authority of Ministry of Higher Education. The NCS are endorsed by the Employment Sector Councils of the respective sectors and validated by the Maldives Qualification Authority.

KEY FOR CODING

Coding Competency Standards and Related Materials

DESCRIPTION	REPRESENTED BY
Industry Sector as per ESC (Three letters)	Construction Sector (CON) Fisheries and Agriculture Sector (FNA) Transport sector (TRN) Tourism Sector (TOU) Social Sector (SOC) Foundation (FOU)
Competency Standard	S
Occupation with in a industry Sector	Two digits 01-99
Unit	U
Common Competency	1
Core Competency	2
Optional/ Elective Competency	3
Assessment Resources Materials	A
Learning Resources Materials	L
Curricula	C
Qualification	Q1, Q2 etc.
MNQF level of Qualification	L1, L2 etc.
Version Number	V1, V2 etc.
Year of endorsement of standard, qualification	By two digits Example- 07

1. Endorsement Application for Qualification 01		
2. NATIONAL CERTIFICATE III IN PROGRAMMING		
3.Qualification code: SOC30SQ1L318		Total Number of Credits: 42
4. Purpose of the qualification		
The holders of this qualification are expected to work as Beginner Programmers in companies or as a freelancer.		
5. Regulations for the qualification		National Certificate III in Programming will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10
6. Schedule of Units		
Unit Title	Unit Title	Code
1.	Work effectively in an information technology	SOC30S1U01V1
2.	Apply occupational health and safety procedures	SOC30S1U02V1
3.	Develop and practice negotiation skills	SOC30S1U03V1
4.	Solve problems related to work activities	SOC30S1U04V1
5.	Apply quality standards	SOC30S1U05V1
6.	Perform computer operations	SOC30S1U06V1
7.	Use relevant technologies	SOC30S1U07V1
8.	Use mathematical concepts and techniques	SOC30S1U08V1
9.	Apply introductory programming skills	SOC30S1U09V1
10.	Create basic databases	SOC30S1U10V1
7. Accreditation Requirements		The training provider should have a lab or similar training facility to provide the trainees with hands-on experience related to this qualification
8. Recommended Sequencing		As appearing under the section 06

1. Endorsement Application for Qualification 02		
2. NATIONAL CERTIFICATE IV IN PROGRAMMING		
3.Qualification code: SOC3oSQ2L418		Total Number of Credits: 138
4. Purpose of the qualification		
The holders of this qualification are expected to work as Web Application Developers in companies or as a freelancer.		
5. Regulations for the qualification		National Certificate IV in Programming will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19+20+21+22+23
6. Schedule of Units		
Unit Title	Unit Title	Code
1.	Work effectively in an information technology	SOC3oS1Uo1V1
2.	Apply occupational health and safety procedures	SOC3oS1Uo2V1
3.	Develop and practice negotiation skills	SOC3oS1Uo3V1
4.	Solve problems related to work activities	SOC3oS1Uo4V1
5.	Apply quality standards	SOC3oS1Uo5V1
6.	Perform computer operations	SOC3oS1Uo6V1
7.	Use relevant technologies	SOC3oS1Uo7V1
8.	Use mathematical concepts and techniques	SOC3oS1Uo8V1
9.	Apply introductory programming skills	SOC3oS1Uo9V1
10.	Create basic databases	SOC3oS1U1oV1
11.	Lead workplace communication	SOC3oS2Uo1V1
12.	Lead small teams	SOC3oS2Uo2V1
13.	Develop a micro business proposal	SOC3oS2Uo3V1
14.	Build client relationships and business networks	SOC3oS2Uo4V1
15.	Apply mathematical techniques for software	SOC3oS2Uo5V1
16.	Perform programming in Python	SOC3oS2Uo6V1
17.	Perform Programming in HTML5 with CSS3	SOC3oS2Uo7V1
18.	Perform Programming using JavaScript	SOC3oS2Uo8V1
19.	Perform programming by using JQuery	SOC3oS2Uo9V1
20.	Use structured query language	SOC3oS2U1oV1
21.	Perform relational database management in SQL	SOC3oS2U11V1
22.	Authentication & Authorization: OAuth	SOC3oS2U12V1
23.	Full Stack Foundations	SOC3oS2U13V1

7. Accreditation Requirements	The training provider should have a lab or similar training facility to provide the trainees with hands-on experience related to this qualification
8. Recommended Sequencing	As appearing under the section 06

UNIT DETAILS

Unit Title	Unit Title	Code	Level	No of credits
1.	Work effectively in an information technology environment	SOC3oS1U01V1	3	2
2.	Apply occupational health and safety procedures	SOC3oS1U02V1	3	2
3.	Develop and practice negotiation skills	SOC3oS1U03V1	3	3
4.	Solve problems related to work activities	SOC3oS1U04V1	3	3
5.	Apply quality standards	SOC3oS1U05V1	3	3
6.	Perform computer operations	SOC3oS1U06V1	3	5
7.	Use relevant technologies	SOC3oS1U07V1	3	3
8.	Use mathematical concepts and techniques	SOC3oS1U08V1	3	5
9.	Apply introductory programming skills	SOC3oS1U09V1	3	8
10.	Create basic databases	SOC3oS1U10V1	3	8
11.	Lead workplace communication	SOC3oS2U01V1	4	3
12.	Lead small teams	SOC3oS2U02V1	4	3
13.	Develop a micro business proposal	SOC3oS2U03V1	4	3
14.	Build client relationships and business networks	SOC3oS2U04V1	4	3
15.	Apply mathematical techniques for software development	SOC3oS2U05V1	4	10
16.	Perform programming in Python	SOC3oS2U06V1	4	10
17.	Perform Programming in HTML5 with CSS3	SOC3oS2U07V1	4	8
18.	Perform Programming using JavaScript	SOC3oS2U08V1	4	10
19.	Perform programming by using JQuery	SOC3oS2U09V1	4	8
20.	Use structured query language	SOC3oS2U10V1	4	10
21.	Perform relational database management in SQL database technology	SOC3oS2U11V1	4	10
22.	Authentication & Authorization: OAuth	SOC3oS2U12V1	4	8
23.	Full Stack Foundations	SOC3oS2U13V1	4	10

Packaging of National Qualifications:

National Certificate III in Programming will be awarded to those who are competent in units
1+2+3+4+5+6+7+8+9+10

Qualification Code: SOC3oSQ1L318

National Certificate IV in Programming will be awarded to those who are competent in units
1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19+20+21+22+23

Qualification Code: SOC3oSQ2L418

Competency Standard for

PROGRAMMING

Unit No	Unit Title
1.	Work effectively in an information technology environment
2.	Apply occupational health and safety procedures
3.	Develop and practice negotiation skills
4.	Solve problems related to work activities
5.	Apply quality standards
6.	Perform computer operations
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21.	Perform relational database management in SQL database technology
22.	Authentication & Authorization: OAuth
23.	Full Stack Foundations

Description of a Web Developer

A Web Developer is responsible for designing, coding and modifying websites, from layout to function and according to a client's specifications. They strive to create visually appealing sites that feature user-friendly design and clear navigation.

Competency Standard Development Process

The competencies were determined based on the expectation of tasks to be performed by a Web Developer in the Maldives. The skill analysis was based global IT industry standards with moderate adjustments, pertaining to the industry trend relating to Maldives.

Competency standards used for similar type of training in other countries were also examined.

Further considerations were also given with special care, to not only develop deliverable skill sets, but to also lay a foundation in character building. This is in line with wholistic development philosophy, values, and practices common to the IT industry globally.

Final considerations were made to factor in the general demographic profile of vocational trainees and efforts were also made to communicate the objectives and criteria in simple English, in order to achieve a higher rate of success to this training module.

Unit 01

Unit Title	Work effectively in an information technology environment				
Descriptor	This unit defines the competency required to support work effectively in an information technology environment				
CODE	SOC3oS1U01V1	LEVEL	3	CREDIT	2

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Comply with general IT policies and procedures	1.1 Roles of key players of the Information Technology organization are determined and briefly explained 1.2 Career choices and options are determined 1.3 Policies and procedures are complied with, as directed by supervisor
2. Promote the organization and the IT department in a Manner consistent with the organization mission	2.1 Role of the Information Technology functions within the organization is briefly explained 2.2 Organization is promoted in a positive way
3. Identify Information Technology equipment/ software and operating system supported by the organization	3.1 Information Technology equipment/software and operating system supported by the organization are identified 3.2 Equipment, location and service requirements are identified according to organizational requirements

Range Statement

Key player;

- May include but are not limited to: Information Technology organisations, vendors of IT products and services, IT professional bodies, industry publications and Government Departments involved in IT industry promotion, employer organisations, relevant unions.

Clients;

- Variables may include but are not limited to: internal and external customers, employers and employees.

Organisational;

- Safety policies, Occupational Health and Safety procedures, ethical work practices
- Size and type of organisation and organisational values and culture may vary

Information Technology Department;

- The structure of the Information Technology department may be a separate branch, department, division or an integrated function of an organisation.

Information Technology Components;

- Can include hardware, software and communications packages.

Client user;

- May be a department within an organisation or a third party and so the relationship and ease of access will vary.

Documentation and Reporting;

- Audit trails, naming standards, version control.

Organisational Standards;

- May be based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best practice examples from industry will be used.

Assessment Guide Forms of assessment

- Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

- Assessment may be done in workplace or a simulated work environment.

Critical aspects for Assessment

- Assessment must confirm the ability to assimilate into the Information Technology department by demonstrating organisational values through the organisational code of conduct in work place interactions.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Basic principles of ethical practice when promoting the organization in a manner consistent with the organizational mission• Broad knowledge of organizational code of conduct and values that are consistent with the organizational mission• Basic understanding of organizational systems Current industry accepted hardware and software products with broad knowledge of general features and capabilities• Broad knowledge base of vendor product directions	<ul style="list-style-type: none">• Reading and writing at a level where general workplace documents can be written and understood.• Verbal communication is clear and precise, for example when explaining the role of key players in the Information Technology organization.• Problem-solving is limited to basic known problems within normal routines, for example, when complying with policies and procedures as directed by supervisor• Basic analysis skills in relation to normal routine work processes, for example, when complying with policies and procedures as directed by supervisor

Unit 02

Unit Title	Apply occupational health and safety procedures				
Descriptor	This unit defines the competency required to support the organization's Occupational Health and Safety principles and practices.				
CODE	SOC3oS1U02V1	LEVEL	3	CREDIT	2

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Determine Occupational Health and Safety (OH&S) issues relating to immediate work environment	<ul style="list-style-type: none">1.1. Occupational Health and Safety issues in the immediate workplace are assessed and action to rectify the problem is taken or reported to supervisor1.2. Workplace and OH&S procedures are followed to ensure safe working environment
2. Document and Disseminate Occupational Health & Safety requirements	<ul style="list-style-type: none">2.1. Information relating to Occupational Health and Safety regulations and requirements are obtained2.2. OH&S regulations impacting upon the Information Technology client area are determined and documented2.3. Documents are submitted to supervisor for verification2.4. Occupational Health and Safety documents are provided to all work stations2.5. Occupational Health and Safety documents relating to IT are updated and re-issued2.6. as required

<p>3. Provide basic ergonomic advice</p>	<p>3.1. Ergonomic requirements of clients are assessed</p> <p>3.2. Advice is provided to clients based on vendor requirements, workplace policies and the latest OH&S information</p> <p>3.3. Advice is documented and passed on to client and supervisor</p>
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Range Statement

Organisational;

- Variables may include, but are not limited to: Occupational Health and Safety legislation; organisation safety procedures; work stations and work environment procedures; presence and impact of OH&S manager.

Advice on ergonomics;

- Includes: Occupational Health and Safety procedures; using and cleaning Visual Display Units (VDUs); advice on footrests, exercises, times for breaks, armrests, chairs.

Operating Systems;

- Command line and Graphical User Interface

Literacy skills;

- In relation to work place documentation may vary

OH and S standard;

- As per company, statutory and vendor requirements. Ergonomic and environmental factors must be considered during the demonstration of this competency as well as Occupational Health and Safety guidelines related to use of screen-based equipment, computing equipment and peripherals, and ergonomic work stations, security procedures and customisation requirements.
- Maybe based upon formal, well-documented methodologies, or non-existent. For training delivery purposes, best practice examples from industry will be used.

Quality process;

- Some organisations may be quality certified and have well-documented standards for addressing quality while others will not.

Assessment Guide Form of assessment

- Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

- Assessment may be done in workplace or a simulated work environment.

Critical aspects of evidence

- Assessment must confirm the ability to comply with Occupational Health and Safety requirements relating to the use of computing equipment through the practical demonstration of the identification of unsafe practices and taking action to correct them.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • General ergonomic principles to avoid back, wrist and eye strain • Procedures and exercises for avoiding strain and injury • Current business practices in relation to preparing reports • Broad knowledge of Organizational Health and Safety requirements in relation to work safety, environmental factors and ergonomic considerations 	<ul style="list-style-type: none"> • Reading and writing are at a level where basic workplace documents are understood and presented • Questioning and active listening is employed to confirm information • Plain English literacy and communication skills in relation to dealing with clients and team members • Problem solving skills for a defined range of predictable problems

Unit 03

Unit Title	Develop and practice negotiation skills				
Descriptor	This unit covers the skills, knowledge and attitudes required to collect information in order to negotiate to a desired outcome and participate in the negotiation				
CODE	SOC30S1U03V1	LEVEL	3	CREDIT	3

ELEMENT	PERFORMANCE CRITERIA	
	<i>Italicized</i> terms are elaborated in the Range of Variables	
1. Plan negotiations	1.1	Information on <i>preparing for negotiation</i> is identified and included in the plan
	1.2	Information on creating <i>nonverbal environments</i> for positive negotiating is identified and included in the plan
		Information on <i>active listening</i> is identified and included in the plan
	1.3	Information on different <i>questioning techniques</i> is identified and included in the plan
2. Participate in negotiations		Information is checked to ensure it is correct and up-to- date
	2.1	Criteria for successful outcome are agreed upon by all parties and desired outcome of all parties are considered
	2.2	Appropriate language is used throughout the negotiation
	2.3	A variety of questioning techniques are used
	2.4	The issues and processes are documented and agreed upon by all parties
	2.5	Possible solutions are discussed and their viability assessed
		Areas for agreement are confirmed and recorded
		Follow-up action is agreed upon by all parties

Range Statement

Preparing for negotiation;

- Background information on other parties to the negotiation
- Good understanding of topic to be negotiated
- Clear understanding of desired outcome/s

Personal attributes;

- Self-awareness
- Self esteem
- objectivity
- empathy
- respect for others
- Interpersonal skills
- listening/reflecting
- nonverbal communication
- assertiveness
- behavior labeling
- testing understanding
- seeking information
- self-disclosing

Analytic skills;

- observing differences between content and process
- identifying bargaining information
- applying strategies to manage process
- applying steps in negotiating process
- strategies to manage conflict
- steps in negotiating process
- options within organization and externally for resolving conflict

Non-verbal environments;

- Friendly reception
- Warm and welcoming room
- Refreshments offered
- Lead in conversation before negotiation begins

Active listening;

- Attentive
- Don't interrupt
- Good posture
- Maintain eye contact
- Reflective listening

Questioning techniques;

- Direct
- Indirect
- Open-ended

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Observation/demonstration and questioning
- Portfolio assessment
- Oral and written questioning
- Third party report

Assessment context

Competency may be assessed in the workplace or in simulated workplace environment

Critical aspects

Assessment requires evidence that the candidate:

- Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome
- Participated in negotiation with at least one person to achieve an agreed outcome

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Codes of practice and guidelines for the organization• Organizations policy and procedures for negotiations• Decision making and conflict resolution strategies procedures• Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation• Flexibility• Empathy	<ul style="list-style-type: none">• Interpersonal skills to develop rapport with other parties• Communication skills (verbal and listening)• Observation skills• Negotiation skills

Unit 04

Unit Title	Solve problems related to work activities				
Descriptor	This unit covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem-solving techniques and to determine and resolve the root cause of problems.				
CODE	SOC30S1U04V1	LEVEL	3	CREDIT	3

ELEMENT	PERFORMANCE CRITERIA
1. Identify the problem	1.1. Variances are identified from normal operating parameters; and product quality 1.2. Extent, cause and nature of the problem are defined through observation, investigation and analytical techniques 1.3. Problems are clearly stated and specified
2. Determine fundamental causes of the problem	2.1. Possible causes are identified based on experience and the use of problem solving tools / analytical techniques. 2.2. Possible cause statements are developed based on findings 2.3. Fundamental causes are identified per results of investigation conducted
3. Determine corrective action	3.1. All possible options are considered for resolution of the problem 3.2. Strengths and weaknesses of possible options are considered 3.3. Corrective actions are determined to resolve the problem and possible future causes 3.4. Action plans are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures
4. Provide recommendation/s to manager	4.1. Report on recommendations are prepared 4.2. Recommendations are presented to appropriate personnel. 4.3. Recommendations are followed-up, if required

Range Statement

Analytical techniques;

- Brainstorming
- Intuitions/Logic
- Cause and effect diagrams
- SWOT analysis
- Gant chart, Pert CPM and graphs

Problem;

- Non–routine process and quality problems
- Equipment selection, availability and failure
- Teamwork and work allocation problem
- Safety and emergency situations and incidents

Action plans;

- Priority requirements
- Measurable objectives
- Resource requirements
- Timelines
- Coordination and feedback requirements
- Safety requirements
- Risk assessment
- Environmental requirements

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Case studies on solving problems in the workplace
- Observation

Assessment context

Competency may be assessed in the workplace or in simulated workplace environment

Critical aspects

Assessment requires evidence that the candidate:

- Identified the problem
- Determined the fundamental causes of the problem
- Determined the correct / preventive action

- Provided recommendation to manager

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • Relevant equipment and operational processes • Enterprise goals, targets and measures • Enterprise quality, OHS and environmental requirement • Principles of decision making strategies and techniques • Enterprise information systems and data collation • Industry codes and standards • 	<ul style="list-style-type: none"> • Using range of formal problem solving techniques • Identifying and clarifying the nature of the problem • Devising the best solution • Evaluating the solution • Implementation of a developed plan to rectify the problem

Unit 05

Unit Title	Apply quality standards				
Descriptor	This unit covers the knowledge, skills, attitudes and values needed to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organization procedures and customer requirements.				
CODE	SOC3oS1Uo5V1	LEVEL	3	CREDIT	3

ELEMENT	PERFORMANCE CRITERIA
1. Assess quality of received materials	1.1. Work instruction is obtained and work is carried out in accordance with standard operating procedures. 1.2. Received materials are checked against workplace standards and specifications. 1.3. Faulty materials related to work are identified and isolated. 1.4. Faults and any identified causes are recorded and/or reported to the supervisor concerned in accordance with workplace procedures. 1.5. Faulty materials are replaced in accordance with workplace procedures.
2. Assess own work	2.1. Documentation relative to quality within the company is identified and used. 2.2. Completed work is checked against workplace standards relevant to the task undertaken. 2.3. Errors are identified and isolated. 2.4. Information on the quality and other indicators of production performance are recorded in accordance with workplace procedures. 2.5. In cases of deviations from specific quality standards , causes are documented and reported in accordance with the workplace's standards operating procedures.
3. Engage in quality improvement	3.1. Process improvement procedures are participated in relative to workplace assignment. 3.2. Work is carried out in accordance with process improvement procedures. 3.3. Performance of operation or quality of product of service to ensure customer satisfaction is monitored.

Range Statement

Materials;

- Manuals
- Job orders
- Instructional videos

Faults;

- Materials not to specification
- Materials contain incorrect/outdated information
- Hardware defects
- Materials that do not conform with any regulatory agencies

Documentation;

- Organization work procedures
- Manufacturer's instruction manual
- Customer requirements
- Forms

Errors;

- Deviation from the requirements of the Client
- Deviation from the requirement of the organization

Quality standards;

- Materials
- Hardware
- Final product
- Production processes
- Customer service

Customer;

- Co-worker
- Supplier/Vendor
- Client
- Organization receiving the product or service

ASSESSMENT GUIDE

Form of assessment

The assessor must select two of the following to objectively evaluate the candidate:

- Observation and oral questioning
- Third party report
- Portfolio
- Practical demonstration

Assessment context

Competency may be assessed in the workplace or in simulated workplace environment

Critical aspects

Assessment must show that the candidate:

- Carried out work in accordance with the company's standard operating procedures
- Performed task according to specifications
- Reported defects detected in accordance with standard operating procedures
- Carried out work in accordance with the process improvement procedures

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Relevant production processes, materials and products• Characteristics of materials, software and hardware used in production processes• Quality checking procedures• Workplace procedures• Safety and environmental aspects of production processes• Fault identification and reporting• Quality improvement processes	<ul style="list-style-type: none">• Reading skills required to interpret work instruction• Communication skills needed to interpret and apply defined work procedures• Carry out work in accordance with OHS policies and procedures• Critical thinking• Solution providing and decision-making

Unit 06

UNIT TITLE	Perform computer operations				
DESCRIPTOR	This unit covers the knowledge, skills, attitudes and values needed to perform computer operations which include inputting, accessing, producing and transferring data using the appropriate hardware and software				
CODE	SOC3oS1Uo6V1	LEVEL	3	CREDIT	5

ELEMENT	PERFORMANCE CRITERIA	
	<i>Italicized</i> terms are elaborated in the Range of Variables	
1. Plan and prepare for task to be taken undertaken	1.1.	Requirements of task are determined in accordance with the required output.
	1.2.	Appropriate hardware and software are selected according to task assigned and required outcome.
	1.3.	Task is planned to ensure that OH & S guidelines and procedures are followed.
	1.4.	Client -specific guidelines and procedures are followed.
	1.5.	Required data security guidelines are applied in accordance with existing procedures.
2. Input data into computer	2.1.	Data are entered into the computer using appropriate program/application in accordance with company procedures.
	2.2.	Accuracy of information is checked and information is saved in accordance with standard operating procedures.
	2.3.	Inputted data is stored in storage media according to requirements.
	2.4.	Work is performed within ergonomic guidelines .
3. Access information using computer	3.1.	Correct program/application is selected based on job requirements.
	3.2.	Program/application containing the information required is accessed according to company procedures.
	3.3.	Desktop icons are correctly selected, opened and closed for navigation purposes.
	3.4.	Keyboard techniques are carried out in line with OH & S requirements for safe use of keyboards.
4. Produce output/ data using computer system	4.1.	Entered data are processed using appropriate software commands.
	4.2.	Data are printed out as required using computer hardware /peripheral devices in accordance with standard operating procedures.
	4.3.	Files and data are transferred between compatible systems using computer software, hardware/peripheral devices in accordance with standard operating procedures.

5. Use basic functions of a www-browser to locate information	5.1. Information requirements for internet search are established. 5.2. Browser is launched. 5.3. Search engine is loaded. 5.4. Appropriate search criteria/or URL of site is entered. 5.5. Relevant links are followed to locate required information. 5.6. Useful pages are bookmarked or printed as required.
6. Maintain computer equipment and systems	6.1. Procedures for ensuring security of data, including regular back-ups and virus checks are implemented in accordance with standard operating procedures. 6.2. Basic file maintenance procedures are implemented in line with the standards operating procedures.

Range Statement

Hardware and peripheral devices;

- Personal computers
- Networked systems
- Communication equipment
- Printers
- Scanners
- Keyboard
- Mouse

Software;

- Word processing packages
- Database packages
- Internet
- Client Specific Software

OH & S guidelines;

- OHS guidelines
- Enterprise procedures

Storage media;

- Diskettes
- CDs
- Zip disks
- hard disk drives, local and remote
- Optical drives

Ergonomic guidelines;

- Types of equipment used
- Appropriate furniture
- Seating posture
- Lifting posture
- Visual display unit screen brightness

Desktop icons;

- Icons include the following but not limited to:
- Directories/folders
- Files

- Network devices
- Recycle bin
- Program icons

Maintenance;

- Creating and managing more space in the hard disk and other peripherals
- Reviewing programs
- Deleting unwanted files
- Backing up files
- Checking hard drive for errors
- Using up to date anti-virus programs
- Cleaning dust from internal and external surfaces

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Direct Observation
- Interview

Assessment context

Competency may be assessed in the workplace or in simulated workplace environment

Critical aspects

Assessment must show that the candidate:

- Selected and used hardware components correctly and according to the task requirement
- used basic software applications to create new files and documents
- Produced accurate and complete data in accordance with the requirements
- Used appropriate devices and procedures to transfer files/data accurately
- Used basic functions of a www-browser to locate information.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • Basic ergonomics of keyboard and computer user • Main types of computers and basic features of different operating systems • Main parts of a computer • Storage devices and basic categories of memory • Relevant types of software • General security, privacy legislation and copyright 	<ul style="list-style-type: none"> • Reading and comprehension skills required to interpret work instruction and to interpret basic user manuals. • Communication skills to identify lines of communication, request advice, follow instructions and receive feedback. • Technology skills to use equipment safely including keyboard skills.

<ul style="list-style-type: none"> • Viruses • OH & S principles and responsibilities • Calculating computer capacity • Productivity Application • Business Application • System Software 	
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Unit 07

UNIT TITLE	Use relevant technologies				
DESCRIPTOR	This unit of competency covers the knowledge, skills, and attitude required in selecting, sourcing and applying appropriate and affordable technologies in the workplace.				
CODE	SOC3oS1Uo7V1	LEVEL	3	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Study/select appropriate technology	1.1 Usage of different technologies is determined based on job requirements 1.2 Appropriate technology is selected as per work specification
Apply relevant technology	2.1 Relevant technology is effectively used in carrying out function 2.2 Applicable software and hardware are used as per task requirement 2.3 Management concepts are observed and practiced as per established industry practices
Maintain/enhance relevant technology	3.1 Maintenance of technology is applied in accordance with the industry standard operating procedure, manufacturer's operating guidelines and occupational health and safety procedure to ensure its operative ability 3.2 Updating of technology is maintained through continuing education or training in accordance with job requirement 3.3 Technology failure/ defect is immediately reported to the concern/responsible person or section for appropriate action

Range Statement

Technology;

May include but are not limited to:

- Office technology
- Industrial technology
- System technology
- Information technology
- Training technology

Management concepts;

May include but not limited to:

- Real Time Management
- Continuous improvement
- 5S
- Total Quality Management
- Other management/productivity tools

Industry standard operating procedure;

- Written guidelines relative to the usage of office technology/equipment
- Verbal advise/instruction from the co-worker

Manufacturer's operating guidelines/ instructions;

- Written instruction/manuals of specific technology/ equipment
- General instruction manual
- Verbal advise from manufacturer relative to the operation of equipment

Occupational health and safety procedure;

- Company guidelines in using technology/equipment

Appropriate action;

- Implementing preventive maintenance schedule
- Coordinating with manufacturer's technician

ASSESSMENT GUIDE

Form of assessment

Competency must be assessed through:

- Interview
- Actual demonstration
- Authenticated portfolio (related certificates of training/seminar)

Assessment context

Competency may be assessed in actual workplace or simulated environment

Critical aspects

Assessment requires evidence that the candidate:

- Studied and selected appropriate technology consistent with work *requirements*
- Applied relevant technology
- Maintained and enhanced operative ability of relevant technology

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • Awareness on technology and its function • Repair and maintenance procedure • Operating instructions • Applicable software • Communication techniques • Health and safety procedure • Company policy in relation to relevant technology • Different management concepts • Technology adaptability 	<ul style="list-style-type: none"> • Relevant technology application/implementation • Basic communication skills • Software applications skills • Basic troubleshooting skills

Unit 08

UNIT TITLE	Use mathematical concepts and techniques				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes required in the application of mathematical concepts and techniques.				
CODE	SOC3oS1Uo8V1	LEVEL	3	CREDIT	5

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Identify mathematical tools and techniques to solve problem	1.1 Problem areas are identified based on given condition 1.2 Mathematical techniques are selected based on the given problem
Apply mathematical procedure/solution	2.1 Mathematical techniques are applied based on the problem identified 2.2 Mathematical computations are performed to the level of accuracy required for the problem 2.3 Results of mathematical computation is determined and verified based on job requirements
Analyze results	3.1 Result of application is reviewed based on expected and required specifications and outcome 3.2 Appropriate action is applied in case of error

Range Statement

Mathematical techniques;

May include but are not limited to:

- Four fundamental operations
- Measurements
- Use/Conversion of units of measurements
- Use of standard formulas

Appropriate action;

- Review in the use of mathematical techniques (e.g. recalculation, re-modeling)
- Report error to immediate superior for proper action

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Authenticated portfolio
- Written Test
- Interview/Oral Questioning
- Demonstration

Assessment context

Competency may be assessed in the work place or in a simulated work place setting

Critical aspects

Assessment requires evidence that the candidate:

- Identified, applied and reviewed the use of mathematical concepts and techniques to workplace problems

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Fundamental operation (addition, subtraction, division, multiplication)• Measurement system• Precision and accuracy• Basic measuring tools/devices	<ul style="list-style-type: none">• Applying mathematical computations• Using calculator• Using different measuring tools

Unit 09

UNIT TITLE	Apply introductory programming skills in another language				
DESCRIPTOR	This unit describes the skills and knowledge required to carry out programming activities using a procedural approach.				
CODE	SOC3oS1Uo9V1	LEVEL	3	CREDIT	8

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Apply basic language syntax and layout	1.1 Apply basic language syntax rules 1.2 Use language data types, operators and expressions to create clear and concise code 1.3 Use appropriate language syntax for sequence, selection and iteration constructs
Code using data structures	2.1 Use data structures 2.2 Write code to create and manipulate arrays 2.3 Design, define and use data structures
3. Code using standard algorithms	.1 Create sequential search, binary search, insertion and deletion algorithms to operate on arrays 3.2 Code standard sequential access algorithms and random-access algorithms
Debug code	4.1 Use stand-alone debugging tools or tools provided by integrated development environment (IDE) to debug code 4.2 Use a debugger to trace code execution and examine variable contents to detect and correct errors
Document activities	5.1 Follow organizational guidelines for developing maintainable code and adhere to provided coding standard when documenting activities 5.2 Apply internal documentation, suitable for use by peers, to all code created and use documentation tools available in target language when documenting activities
Test code	6.1 Design and document tests

Range Statement

- Language may include:
 - C++
 - C#
 - Java
 - JavaScript
 - Visual Basic (VB)
 - VBScript.
-
- Constructs may include:
 - iterations or loops
 - nested control structures
 - selection statements:
 - if
 - switch.
-
- Data structures may include:
 - arrays
 - collections
 - dictionaries
 - lists
 - maps
 - sets.
-
- Arrays may include:
 - multi-dimensional arrays
 - one-dimensional arrays.
-
- Integrated development environment may include:
 - C++Builder
 - Cod elite
 - Eclipse
 - Java Builder
 - Microsoft Visual Studio
 - NetBeans
 - XCode.
-
- Organizational guidelines may include:
 - communication methods

- content of emails
- dispute resolution
- document procedures
- downloading information and accessing particular websites
- financial control mechanisms
- opening mail with attachments
- personal use of emails and internet access
- templates
- virus risk.

ASSESSMENT GUIDE

Form of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- evaluation of candidate s application code, test and documentation
- verbal or written questioning of candidate on key programming concepts, such as:
- syntax and language features
- aggregate data types (such as collections, lists, hash tables, arrays and queues) that are appropriate to the language studied
- using an IDE
- debugging code.

Critical aspects

Evidence of the ability to:

perform programming coding to create, debug and test medium-size applications

generate design and code documentation

test and confirm that created application meets program specifications.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • basic knowledge of: • documentation techniques • programming techniques • testing techniques • small-size application development. • 	<ul style="list-style-type: none"> • literacy skills to: • read and interpret: • code standards and organizational guidelines • program specifications • write internal documentation • problem-solving skills to develop solutions for applications • technical skills to use integrated development environment

Unit 10

Unit Title	Operate a word processing and Database applications (Database)				
Descriptor	This unit defines the competency required to correctly operate database applications and perform basic operations				
CODE	SOC3oS1U10V1	LEVEL	3	CREDIT	8

ELEMENT OF COMPETENCIES	PERFORMANCE CRITERIA
1. Create a database	<ul style="list-style-type: none">1.1 Formulate a simple design for a two-table database incorporating basic design principles1.2 Develop tables with fields and attributes according to database usage requirements1.3 Enter data and link and navigate tables1.4 Create a primary key and establish an index1.5 Modify table layout and field attributes as required1.6 Modify data in tables for information requirements1.7 Add and delete records as required1.8 Follow correct close down procedures to ensure data is not lost
2. Customise basic settings	<ul style="list-style-type: none">2.1 Adjust page display modes, orientation and size to meet user requirements and / or2.2 special needs2.3 Modify toolbar to meet user and database uses2.4 Ensure font type, size and color is appropriate for the purpose of the database
3. Create reports	<ul style="list-style-type: none">3.1 Design report to present data in a logical sequence3.2 Modify reports to include / exclude additional information requirements3.3 Modify existing reports to accommodate current information requirements3.4 Distribute reports are in a suitable format (softcopy/ hardcopy)

4. Create forms	<p>4.1 Create simple forms which include imported files (images/graphics) and customized using a wizard</p> <p>4.2 Open existing database and modify records through a simple form</p> <p>4.3 Rearrange objects within the form to accommodate information requirements</p> <p>4.4 Save and close database to hard disk and disk</p>
5. Retrieve information	<p>5.1 Access existing database and locate required record</p> <p>5.2 Create simple query and retrieve required information</p> <p>5.3 Develop query with multiple criteria and retrieve required information</p> <p>5.4 Apply filters and access information</p> <p>5.5 Refine queries to more precisely retrieve information</p> <p>5.6 Select data and sort according to information retrieval requirements</p>

Range Statement

1.3. The Range of Variables statement contextualize the unit of competence and provide a focus for assessment. The information provided is intended to define the scope of assessment and to assist assessors define the performance to be achieved by an individual in the workplace.

Hardware

1.3. variables may include but are not limited to personal computers and networked systems.

Document

1.3. variables may include but are not limited to: established files and new documents.

Software

1.3. variables may include but are not limited to: commercial software applications; organisational specific software; word processing.

Keyboarding

1.3. Speed will vary according to different organisational requirements and different job roles within an organisation. The keyboard technique will be in line with OHS requirements for safe use of keyboards.

Organizational

1.3. variables may include but are not limited to: keyboarding and accuracy as per organisation guidelines.

Operating Systems

1.3. Command line and Graphical User Interface.

Disks

1.3. may include but are not limited to: diskettes, CDs, zip disks.

OH, and S Standards

1.3. As per company, statutory and vendor requirements. Ergonomic and environmental factors must be considered during the demonstration of this competency; Occupational Health and Safety guidelines related to use of screen based equipment, computing equipment and peripherals, and ergonomic work stations; security procedures; customisation requirements.

Workplace environment

1.3. May involve a business involved in a total organisational change, a system only change, a business improvement process, an e-commerce solution involving the total organisation or part of the organization.

Documentation and Reporting

1.3. Documentation for version control may follow ISO standards. Audit trails, naming standards, version control, project management templates and report writing styles will vary according to organisational approach; information gathering processes may have associated templates.

Standards and Procedures

1.3. Will vary from formal procedures that must be adhered to with implementation of financial control mechanisms, communication with stakeholders, dispute resolution and modification procedures, processes for determining size and cost.

Assessment Guide

Form of assessment

1.3. Continuous assessments together with collected evidence of performance will be suitable for this unit.

Assessment context

1.3. Assessment may be done in workplace or a simulated work environment.

Critical aspects of evidence

1.3. Assessment must confirm the ability to design and develop a simple database using a standard database package the candidate must add data, use queries, create forms and reports

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS INCLUDE
<ul style="list-style-type: none">• General OH&S principles and responsibilities• Basic technical terminology in relation to reading help files and prompts• Logging procedures relating to accessing a PC• Organizational benchmarks for keyboarding• Basic technical terminology in relation to reading help files and prompts• Security, viruses, privacy legislation, copyright• Basic database design• Types of software	<ul style="list-style-type: none">• Basic analysis in relation to a limited range of routine areas• Low level decision making in relation to a limited range of routine areas• Reading and writing at a level where basic workplace documents are understood• Communication is clear and precise• Interpretation of user manuals

Unit 11

UNIT TITLE	Lead workplace communication				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes required to lead in the dissemination and discussion of ideas, information and issues in the workplace				
CODE	SOC3oS2Uo1V1	LEVEL	4	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Communicate information about workplace processes	1.1 Appropriate communication method is selected 1.2 Multiple operations involving several topics areas are communicated accordingly 1.3 Questions are used to gain extra information 1.4 Correct sources of information are identified 1.5 Information is selected and organized correctly 1.6 Verbal and written reporting is undertaken when required 1.7 Communication skills are maintained in all situations
Lead workplace discussions	2.1 Response to workplace issues are sought 2.2 Response to workplace issues are provided immediately 2.3 Constructive contributions are made to workplace discussions on such issues as production, quality and safety 2.4 Goals/objectives and action plan undertaken in the workplace are communicated
Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate personnel 3.4 Communication problems and issues are raised as they arise

Range Statement

Methods of communication;

- Non-verbal gestures
- Verbal
- Face to face
- Speaking to groups
- Using telephone

- Written
- Internet

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Direct Observation
- Interview

Assessment context

Competency may be assessed in the workplace or in simulated workplace environment

Critical aspects

Assessment requires evidence that the candidate:

- Dealt with a range of communication/information at one time
- Made constructive contributions in workplace issues
- Sought workplace issues effectively
- Responded to workplace issues promptly
- Presented information clearly and effectively in written form
- Used appropriate sources of information
- Asked appropriate questions
- Provided accurate information

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Organization requirements for written and electronic communication methods• Effective verbal communication methods	<ul style="list-style-type: none">• Organize information• Understand and convey intended meaning• Participate in variety of workplace discussions• Comply with organization requirements for the use of written and electronic communication methods

Unit 12

UNIT TITLE	Lead small teams				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes to lead small teams including setting and maintaining team and individual performance standards				
CODE	SOC3oS2Uo2V1	LEVEL	4	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Provide team leadership	1.1 Work requirements are identified and presented to team members 1.2 Reasons for instructions and requirements are communicated to team members 1.3 Team members' queries and concerns are recognized, discussed and dealt with
Assign responsibilities	2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy 2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible
Set performance expectations for team members	3.1 Performance expectations are established based on client needs and according to assignment requirements 3.2 Performance expectations are based on individual team members duties and area of responsibility 3.3 Performance expectations are discussed and disseminated to individual team members
Supervise team performance	4.1 Monitoring of performance takes place against defined performance criteria and/or assignment instructions and corrective action taken if required 4.2 Team members are provided with feedback, positive support and advice on strategies to overcome any deficiencies 4.3 Performance issues which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5 Team operations are monitored to ensure that employer/client needs and requirements are met 4.6 Follow-up communication is provided on all issues affecting the team 4.7 All relevant documentation is completed in accordance with company procedures

Range Statement

Work requirements;

- Client Profile
- Assignment instructions

Team member's concerns;

- Roster/shift details

Monitor performance;

- Formal process
- Informal process

Feedback;

- Formal process
- Informal process

Performance issues;

- Work output
- Work quality
- Team participation
- Compliance with workplace protocols
- Safety
- Customer service

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Direct observations of work activities of the individual member in relation to the work activities of the group
- Observation of simulation and/or role play involving the participation of individual member to the attainment of organizational goal
- Case studies and scenarios as a basis for discussion of issues and strategies in teamwork

Assessment context

- Competency assessment may occur in workplace or any appropriately simulated environment
- Assessment shall be observed while task is being undertaken whether individually or in-group.

Critical aspects

Assessment requires evidence that the candidate:

- Maintained or improved individuals and/or team performance given a variety of possible scenario
- Assessed and monitored team and individual performance against set criteria
- Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf
- Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed
- Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Company policies and procedures• Relevant legal requirements• How performance expectations are set• Methods of Monitoring Performance• Client expectations• Team member's duties and responsibilities	<ul style="list-style-type: none">• Communication skills required for leading teams• Informal performance counseling skills• Team building skills• Negotiating skills

Unit 13

UNIT TITLE	Develop a micro business proposal				
DESCRIPTOR	This unit describes the performance outcomes, skills and knowledge required to develop an identified business idea, to research the feasibility of the business opportunity and to present a business idea in formats that suit a range of stakeholders.				
CODE	SOC3oS2Uo3V1	LEVEL	4	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Evaluate business opportunities	<ul style="list-style-type: none">1.1 Identify and research key factors influencing viability of business ideas1.2 Analyse business ideas in terms of personal or family needs and commitments1.3 Evaluate impacts of emerging or changing technology, including e-commerce, on the opportunity1.4 Determine viability of business opportunity in line with perceived risks, available resources, financial returns and other outcomes sought1.5 Assess and match personal skills and attributes against those required for a particular business opportunity1.6 Identify and assess business risks according to resources available and personal preferences
Detail the business idea	<ul style="list-style-type: none">2.1 Develop an accurate description of the business idea for key stakeholders2.2 Develop an accurate summary of the major products or services required to suit personal needs and requirements
Prepare the business overview to suit different stakeholders	<ul style="list-style-type: none">3.1 Present an accurate list of key stakeholders and their information requirements

	3.2 Determine an acceptable method of presentation of information for each stakeholder
	3.3 Provide accurate customised information to target audiences

Range Statement

Key factors may include:

- economy
- infrastructure requirements
- legal requirements and licensing
- market competition
- opportunities available
 - resources and premises/location available
 - risks related to a particular business opportunity
 - skills available

Personal skills/attributes may include:

- business knowledge and skills
- communication skills
- entrepreneurship
- financial knowledge and skills
- technical and/or specialist skills
- willingness to explore opportunities

Business risks may be affected by and may include:

- cultural, community factors
- market competition
- market trends
- relevant legislative requirements
- resources available
- security of investment
- security of premises/location
- supply and demand

Accurate description of the business idea includes:

- business type and location such as:
 - specific aspects of type of business
 - type or field of business
 - where the business will operate from

- *overall purpose of the business general scope such as:*
 - address community or social justice objectives
 - maximise profits and personal wealth
 - provide employment opportunities for self, family or community members
 - provide not-for-profit goods and services for the community
 - retain linkages to land or locality

Accurate summary of the major products and/or services includes:

customer and market description such as:

- customer characteristics
- marketing issues to meet needs
- specialised needs of customers

Overall predicted costs including:

- capital
- distribution costs
- insurance
- maintenance
- overheads
- production costs
- supply costs

Processes or operations such as:

- how business might be structured
- what ethical or cultural principles and protocols will guide the running of the business
- what major activities the business will undertake

Resources such as:

- capital
- cultural knowledge
- equipment
- premises
- skills and abilities

Key stakeholders may include:

- business and community members and organizations
- councils (local, land and other)
- customers
- family members
- funding bodies/banks/lending institutions
- Suppliers

Preparing the business overview may mean determining:

- appropriate medium for presentation, such as oral or visual presentation, video, written documentation, developing a web page
- best style of presenting the information, such as using plain English, using first language, joint presentation with key stakeholders
- most suitable information to include in different versions of the overview
- order of information to best suit the needs and interests of the audience
- time and location that best suits the target audience needs and their importance

Method of presentation includes:

- main characteristics of the method
- reasons for the method and any cultural considerations

Presentation may be via:

- formal written business proposal
- oral or visual presentation
- video

ASSESSMENT GUIDE

Form of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- oral or audio-visual presentation of business proposal, depending on the proposed stakeholder/s
- portfolio of evidence including an outline of the business idea, evaluation of viability based on research and presentation of the business idea in an appropriate format for the proposed stakeholder/s
- oral or written questioning to assess knowledge of regulations and codes of practice relevant to the business operation
- review of list of key stakeholders and their information requirements.

Assessment context

Assessment must ensure:

- access to relevant documentation
- candidate's individual circumstances and work in the context of establishing or running a micro business, are the basis for assessment.

Critical aspects

Evidence of the following is essential:

- accurate and complete outline of the business idea that considers the major elements of:
 - products/services
 - customers
 - operations and processes
 - income and expenditure
 - resources
 - marketing
 - location
- evaluation of research results and assessment of the likely viability and practicability of a business opportunity, taking into account the current business/market climate and resources available
- effective presentation of business idea and profile
- knowledge of relevant legislative requirements affecting business operation.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• local government legislative requirements relating to business operation, especially in regard to health and safety and environmental issues, equal employment opportunity, industrial relations• income and expenditure costing• regulations and codes of practice relevant to the business operation• principles of risk assessment relevant to the business opportunity.	<ul style="list-style-type: none">• analytical skills to assess personal attributes and to identify business risks, for example, to conduct strengths, weaknesses, opportunities, threats (SWOT) analysis• communication skills to present information in an appropriate format for the audience• literacy skills to enable interpretation of business information• numeracy skills to analyse data to aid research• research skills to investigate the feasibility of a business opportunity.

Unit 14

UNIT TITLE	Build client relationships and business networks				
DESCRIPTOR	This unit describes the performance outcomes, skills and knowledge required to establish, maintain and improve client relationships, and to actively participate in networks to support attainment of key business outcomes				
CODE	SOC3oS2Uo4V1	LEVEL	4	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Initiate interpersonal communication with clients	<p>1.1 Identify and use preferred client communication styles and methods</p> <p>1.2 Establish rapport with clients using verbal and non-verbal communication processes</p> <p>1.3 Investigate and act upon opportunities to offer positive feedback to clients</p> <p>1.4 Use open questions to promote two-way communication</p> <p>1.5 Identify and act upon potential barriers to effective communication with clients</p> <p>1.6 Initiate communication processes which relate to client needs, preferences and expectations</p>
Establish client relationship management strategies	<p>2.1 Develop client loyalty objectives focusing on the development of long term business partnerships</p> <p>2.2 Assess client profile information to determine approach</p> <p>2.3 Develop client loyalty strategies to attract and retain clients in accordance with the business strategy</p> <p>2.4 Identify and apply client care and client service standards</p>

Maintain and improve ongoing relationships with clients	<p>3.1 Develop strategies to obtain ongoing feedback from clients to monitor satisfaction levels</p> <p>3.2 Develop strategies to elicit feedback which provide information in a form that can be used to improve relationships with clients</p> <p>3.3 Obtain feedback to develop and implement strategies which maintain and improve relationships with clients</p>
Build and maintain networks	<p>4.1 Allocate time to establish and maintain business contacts</p> <p>4.2 Participate in business associations and/or professional development activities to establish and maintain a network of support for the business and to enhance personal knowledge of the market</p> <p>4.3 Establish communication channels to exchange information and ideas</p> <p>4.4 Provide, seek and verify information to the network</p>

Range Statement

Preferred client communication styles and methods may include:

- email
- face-to-face
- mail
- phone

Verbal communication may include:

- articulation
- clarity of speech
- feedback
- language
- listening skills
- open questions
- questioning skills
- voice modulation
- voice projection

Non-verbal communication may include:

- active listening
- body language
- body orientation
- clothing
- color
- distance
- facial expression
- grooming
- gestures
- music
- posture
- sound
- touching
- voice

Barriers to effective communication may include:

- acting on false assumptions and stereotypes
- cultural differences not being addressed
- educational differences not being addressed
- failure to prominently display contact details in all communications provided to the client
- inappropriate word choice
- ineffective non-verbal communication
- lack of 'contact us' forms or pages on websites

- lack of distribution of reply paid cards or envelopes in mail outs
- lack of voice modulation and articulation
- not listening actively
- organizational factors
- physical, personal, gender and age differences not being addressed

Client loyalty strategies include:

- access to dedicated staff
- added value offers
- anniversary offers
- client reward schemes
- credit or discount facilities
- dedicated or private facilities
- discounts
- formal letter of thanks
- handwritten note thanking the client
- offering promotional items
- phone call thanking client for the business
- regular recontact with best clients
- thank you gifts and promotions

Client care and client service standards may include:

- accuracy of billing
- accuracy of product/service descriptions, specifications in marketing communications
- complaint resolution times
- incidences of stock outs and back orders
- on-hold times
- order delivery standards such as:
 - whether right product or service was delivered
 - delivered to right person or address
 - delivered on time
 - politeness, helpfulness and grooming of delivery staff
 - delivery vehicles parked properly
 - cleanliness of delivery vehicles

- shipment tracking services
- telephone answering times and responses

Strategies to obtain ongoing feedback may include:

- including 'comments and queries' on all order forms
- complaints handling procedures
- email
- letter
- surveys of current clients
- telephone interviews
- training staff to ask open questions about product or service levels

Business associations may include:

- industry associations
- institutes
- professional bodies
- societies

Professional development activities may include:

- demonstrations
- exhibitions
- fairs
- industry information seminars
- industry training
- pre-launch activities
- technical information briefings
- trade shows

Networks may include:

- business
- formal
- groups
- individuals

- informal
- organizations
- personal

Information and ideas may include:

- changes in the environment
- changing customer requirements
- information on competitors' activities
- personal, professional or business support

ASSESSMENT GUIDE

Form of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- assessment of written reports
- direct questioning
- observation of the candidate communicating with clients
- observation of presentations made to business networks
- oral or written questioning to assess knowledge and understanding
- review of authenticated documents from the workplace or training environment
- review of testimony from team members, colleagues, supervisors or managers.

Assessment context

Assessment must ensure:

- access to office equipment and resources.

Critical aspects

Evidence of the following is essential:

- establishing and maintaining relationships with a range of clients related to the candidate's business
- participating in and providing, an active contribution to a business-related network.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> key provisions of relevant legislation from all forms of government, codes of practice and national standards that may affect aspects business operations, such as: <ul style="list-style-type: none"> ➤ ethical principles ➤ marketing code of practice ➤ marketing communications concepts and processes ➤ principles and techniques for effective communication and networking ➤ sources of business related networks. 	<ul style="list-style-type: none"> Communication skills to determine client needs and preferences through active listening and presenting ideas clearly and precisely culturally appropriate communication skills to relate to people from diverse backgrounds and people with diverse abilities interpersonal skills to establish rapport, and to build and maintain relationships with clients.

Unit 15

UNIT TITLE	Apply mathematical techniques for software development				
DESCRIPTOR	This unit describes the skills and knowledge required to use basic mathematical methods and operations in standard computer notation, Boolean algebra, data types and computer storage.				
CODE	SOC3oS2Uo5V1	LEVEL	4	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Manipulate algebraic terms, leading to the solution of linear equations	1.1 Position number types on the number line 1.2 Evaluate various numerical expressions involving integers, fractions and indices 1.3 Simplify various algebraic expressions involving integers, fractions and indices
Construct mathematical formulas	2.1 Solve simple equations 2.2 Convert formulas between standard algebraic form and computer form 2.3 Create several formulas in standard algebraic form and in computer form
Simplify and evaluate Boolean expressions and formulas	3.1 Simplify and evaluate several Boolean expressions 3.2 Complete truth tables based on simple Boolean expressions and logic 3.3 Simplify and evaluate several formulas
Manipulate number and character representation systems	4.1 Convert numbers between binary, decimal and hexadecimal number systems 4.2 Add, subtract and multiply numbers in binary 4.3 Determine binary memory storage of an integer and a character

Range Statement

Boolean expressions may include the use of:

- AND
- NOT
- OR

ASSESSMENT GUIDE

Form of assessment

The assessor will assess candidate with:

- Portfolio
- Sample codes

Assessment context

Critical aspects

Evidence of the ability to:

solve and evaluate various mathematical problems in various computational contexts

demonstrate a knowledge, use and manipulation of:

Boolean algebra

number types

memory storage.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• overview knowledge of mathematical terms and operations and calculation tools.	<ul style="list-style-type: none">• analytical skills to evaluate various numerical expressions• numeracy skills to solve simple equations• planning and organizational skills to meet deadlines• problem-solving skills to recognize and address issues and problems.

Unit 16

UNIT TITLE	Perform programming in Python				
DESCRIPTOR	This unit describes the performance outcomes, skills and knowledge for doing foundation level programming in Python				
CODE	SOC3oS2Uo6V1	LEVEL	4	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Introduction to programming fundamentals of Python	1.1 Describe the basic datatypes and sequence types in Python 1.2 Perform the task of creating, updating and removing dictionaries 1.3 Use arithmetic operations and Boolean operations 1.4 Write simple codes by using different types of control flows
Functions in Python	2.1 Use functions from the Python Standard Library 2.2 Describe how to define and call a function 2.3 Perform basic programming by using function
Classes	3.1 Describe how to create a class 3.2 Describe how to instantiate an object 3.3 Describe how to access class attributes and methods 3.3 Describe inheritance 3.4 Use importing and modules 3.5 Describe and use the Built-in 3.6 Use file processing and error handling.

Range Statement

Basic data types:

- Integers
- Floats
- Strings

Sequence types:

- Tuples
- Lists
- Strings

Operators:

- 'in' Operator
- + Operator

- Boolean Expressions
 - True and False
 - Logical Operators
 - Conditional Expressions

Control Flows:

- If statement
- While loops
- Break and continue
- Assert
- For loops
- For loops and the range () function

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Written Test
- Execution of simple codes or programs

Assessment context

Competency may be assessed in the work place or in a simulated work place setting

Critical aspects

Assessment requires evidence that the candidate:

- Identified, applied and reviewed the basic foundation principles of Python.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Basic programming principles in Python• Functions and Classes in Python	<ul style="list-style-type: none">• Basic computer operation skills• Logic analysis• Communication skills• Code writing and debugging skills

Unit 17

UNIT TITLE	Perform Programming in HTML5 with CSS3				
DESCRIPTOR	This unit provides an introduction to HTML5 and CSS3. This course helps students gain basic HTML5/CSS3 programming skills.				
CODE	SOC3oS2U07V1	LEVEL	4	CREDIT	8

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
HTML syntax	1.1 Learn about and install a text editor 1.2 Discover the tree-structured format of HTML 1.3 Use HTML tags to create a simple web page
HTML syntax problem set	2.1 Add headers to structure a page 2.2 Create a list of items 2.3 Add images to an existing site
CSS syntax	3.1 Write a CSS Ruleset 3.2 Use CSS units to place content on the page 3.3 Use Developer Tools to debug CSS
CSS syntax problem set	4.1 Style images 4.2 Style the font of the page 4.3 Create and link a stylesheet

Range Statement

HTML tags:

- <body>
- <head>
- <title>
- Tags related to text, images, lists, links, tables, forms and etc

CSS selectors:

- Selectors for text, color, lists, tables, forms and etc

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Demonstration with questioning
- Observation with questioning
- Assessment of produced documents

Assessment context

- Competency may be assessed in workplace or in a simulated workplace setting
- Assessment shall be observed while task are being undertaken whether individually or in group

Critical aspects

Assessment requires evidence that the candidate:

- Developed basic HTML document using HTML5 and CSS 3 syntax

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Basic scripting in HTML• Basic styling in CSS	<ul style="list-style-type: none">• Basic computer operation skills• Logic analysis• Communication skills• Code writing skills

Unit 18

UNIT TITLE	Perform Programming using JavaScript				
DESCRIPTOR	This unit provides an introduction to JavaScript. This course helps students gain basic JavaScripting programming skills.				
CODE	SOC3oS2Uo8V1	LEVEL	4	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
JavaScript syntax	1.1 Give a brief background on JavaScript 1.2 Describe how to use JavaScript on HTML 1.3 Perform simple JavaScript programs by using variables, operators and constructs
Functions	2.1 Define functions by using <i>function</i> keyword 2.2 Use arrays to create simple programs
Events	3.1 Use events to create simple programs 3.2 Perform exception handling in programs
Classes	4.1 Describe the built-in JavaScript objects 4.2 Create simple programs by using objects and classes
HTML Document Object Model	5.1 Describe what is a Document Object Model(DOM) 5.2 Perform simple manipulations of DOM objects

Range Statement

Operators ;

- Arithmetic (+, -, *, /, %) –
- Assignment (=, +=, -=, *= /=, %=, ++, --)
- Logical (&&, ||, !) –
- Comparison (<, >, <=, >=, ==)

Constructs;

- If-else
- while
- for
- Switch case

Simple user interactions;

- alert(msg)
- confirm(msg)

- prompt(msg, default)

Common events:

- onload and on unload
- on focus, on blur, on change
- on submit
- on mouseover, onmouseout

Built-in JavaScript objects:

- String
- Date
- Array
- Boolean
- Math

Environment objects of HTML DOM:

- Window
- Navigator
- Screen
- History
- Location
- Document

HTML objects

- Anchor,
- Area
- Base
- Body
- Button
- Event
- Form
- Frame, Frameset, Iframe,
- Image and etc.

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Demonstration with questioning
- Observation with questioning
- Assessment of produced documents

Assessment context

- Competency may be assessed in workplace or in a simulated workplace setting
- Assessment shall be observed while task are being undertaken whether individually or in group

Critical aspects

Assessment requires evidence that the candidate:

- Developed basic HTML document using HTML5 and CSS 3 syntax

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Basic scripting in HTML• Basic styling in CSS	<ul style="list-style-type: none">• Basic computer operation skills• Logic analysis• Communication skills• Code writing skills

Unit 19

UNIT TITLE	Perform programming by using JQuery				
DESCRIPTOR	This unit provides an introduction to JQuery and AJAX. This course helps students gain basic JQuery and AJAX programming skills				
CODE	SOC3oS2Uo9V1	LEVEL	4	CREDIT	8

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Introduction to jQuery	1.1 Installing jQuery 1.2 Writing the syntax of jQuery 1.3 Perform simple codes with jQuery selectors 1.4 Perform simple codes with JQuery Event Methods
Perform simple codes with JQuery Effects	2.1 Perform simple codes by using Hide and Show 2.2 Perform simple codes by using Fading 2.3 Perform simple codes by using Sliding 2.4 Perform simple codes by using Animation
Perform simple codes with JQuery functions and methods.	3.1 Perform simple functions by using Callback 3.2 Perform simple codes by using Chaining method 3.3 Perform simple codes by using Get Content and Attributes 3.4 Perform simple codes by using methods to add new content 3.5 Perform simple codes by using methods to remove content
Use JQuery to manipulate CSS	4.1 Perform simple codes to manipulate CSS
Introduction AJAX	5.1 Describe AJAX and its functionality 5.2 Perform simple codes by using AJAX methods

Range Statement

JQuery selectors;

- Element selector
- #id selector
- .class selector

JQuery Event Methods:

- `$(document).ready(function)`
- `$(selector).click(function)`
- `$(selector).focus(function)`
- `$(selector).mouseover(function)`

jQuery Effects:

- `hide()`
- `show()`
- `toggle()`
- `fade in ()`
- `fadeOut ()`
- `fade Toggle ()`
- `fade to ()`
- `slide Down ()`
- `slide Up ()`
- `slide Toggle ()`
- `animate()`

jQuery methods to add new content:

- `append()`
- `prepend()`
- `after()`
- `before()`

jQuery methods to add new content:

- `remove()`
- `empty()`

jQuery methods to manipulate CSS:

- `add Class ()`
- `removeClass()`
- `toggle Class ()`
- `CSS ()`

AJAX methods:

- `load()`
- `get()`
- `post()`
- `no Conflict ()`

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Demonstration with questioning
- Observation with questioning
- Third party report
- Assessment of produced documents

Assessment context

- Competency may be assessed in workplace or in a simulated workplace setting
- Assessment shall be observed while task are being undertaken whether individually or in group

Critical aspects

Assessment requires evidence that the candidate:

- Developed basic JQuery programs by manipulating HTML and CSS elements
- Incorporated AJAX to create JQuery documents

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Basic principles in jQuery• Events and Methods in JQuery	<ul style="list-style-type: none">• Basic computer operation skills• Logic analysis• Communication skills• Code writing and debugging skills

Unit 20

UNIT TITLE	Use structured query language				
DESCRIPTOR	This unit describes the skills and knowledge necessary for using structured query language				
CODE	SOC3oS2U10V1	LEVEL	4	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Write a simple SQL statement to retrieve and sort data	1.1 Retrieve all the data from a single table 1.2 Retrieve data from specific columns in a single table 1.3 Use 'order by' to sort query output
Write an SQL statement that selectively retrieves data	2.1 Restrict the number of rows retrieved, by placing criteria in the 'where' clause 2.2 Restrict the number of rows retrieved, by placing specific criteria in the select statement 2.3 Use comparison operators in the 'where' clause to compare numeric, character, string, date and time data 2.4 Use Boolean operators with the correct precedence 2.5 Use criteria in the 'where' clause, to check for a range of values, to select values from a list, and to check for values that match a pattern 2.6 Use SQL syntax to suppress duplicate values from query results 2.7 Take action to exclude null values from a query result

Write SQL statements that use functions	<p>3.1 Use arithmetical operators with the correct precedence</p> <p>3.2 Use string functions, and operators, to obtain the required query output</p> <p>3.3 Use mathematical functions to obtain the required output</p> <p>3.4 Use date functions to obtain the required output</p> <p>3.5 Use SQL aggregate functions to obtain the required output</p>
Write SQL statements that use aggregation and filtering	<p>Use 'group by' to aggregate data by multiple columns</p> <p>4.2 Sort aggregated data in the query output</p> <p>4.3 Filter aggregated data using the 'having' clause</p>
Write SQL statements that retrieve data from multiple tables	<p>5.1 Employ the inner join syntax, to retrieve data from two or more tables</p> <p>5.2 Use 'left outer', 'right outer' and 'full outer' syntax, to join tables in the select statement</p> <p>5.3 Use correct syntax in the 'where' clause, to retrieve data from multiple tables</p> <p>5.4 Write a union query that retrieves data from more than one table</p>
Write and execute SQL sub-queries	<p>6.1 Construct single and nested sub-queries</p> <p>6.2 Construct sub-queries that return a single row and multiple rows</p> <p>6.3 Use correlated sub-queries to retrieve required data</p> <p>6.4 Write sub-queries that use aggregates</p>

Create and manipulate tables	<p>7.1 Identify the required columns, data types, keys, relationships, indexes and constraints</p> <p>7.2 Use the relevant naming conventions for database elements</p> <p>7.3 Create tables that implement the required elements</p> <p>7.4 Manipulate tables to meet specific requirements</p>
Create and use views	<p>8.1 Create views that satisfy information requirements</p> <p>8.2 Use check constraints in a view</p> <p>8.3 Retrieve, insert, update, and delete data using a view</p> <p>8.4 Drop a view from a database</p>
Create and use stored procedures	<p>9.1 Create and execute stored procedures that use SQL to retrieve, insert, or modify data, according to information requirements</p> <p>9.2 Create and execute stored procedures, that use one or more parameters</p> <p>9.3 Drop a stored procedure from the database</p> <p>9.4 Create and test database triggers that automate data management, or perform specific required data-related functions</p>

Range Statement

- Comparison operators may include:
- equal to
- greater than
- greater than or equal to
- less than
- less than or equal to
- not equal to.
- Boolean operators may include the use of:

- AND
- NOT
- OR.
- Arithmetical operators may include:
- addition
- modulus division
- multiplication
- subtraction.
- Mathematical functions may include:
- cos
- log
- power
- sin
- square root.
- Manipulating tables may include:
- inserting rows into a table
- updating some or all of the data in a table
- adding columns to a table
- modifying a column within a table
- deleting a column from a table
- deleting rows from a table
- viewing detailed information regarding a table
- deleting tables with regard to referential integrity rules.

ASSESSMENT GUIDE

Form of assessment

The assessor will assess candidate with:

- Portfolio
- Sample codes

Critical aspects

- Evidence of the ability to:
- design a simple relational database
- use SQL to create database structures, and store, retrieve and manipulate data in a relational database
- create a variety of SQL queries to match client requirements
- create and use views and stored procedures.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• client-server concepts• data-integrity concepts• data-modelling structures• databases and database objects, including data types, data structures, identifiers and metadata	<ul style="list-style-type: none">• analytical skills to evaluate business requirements to determine:• report and view requirements• required data objects and data structures• numeracy skills to use arithmetical operators and mathematical functions

<ul style="list-style-type: none">• programming concepts• query design• relational database design• SQL client environment• SQL server architecture.•	<ul style="list-style-type: none">• planning and organizational skills to analyses and organize data according to business query and reporting requirements• problem-solving skills to:• troubleshoot SQL syntax errors• understand typical warnings and errors• technical skills to:• run data modelling, particularly during the design and development phases• write SQL queries.•
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Unit 21

UNIT TITLE	Perform relational database management in SQL database technology				
DESCRIPTOR	This unit introduces the fundamentals of SQL, specifically it teaches the concepts of relational databases and the SQL programming language. It teaches how to write queries against single and multiple tables, manipulate data in tables, and create database objects				
CODE	SOC30S2U11V1	LEVEL	4	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Introduction database management system and SQL	1.1 Briefly explain the components of a relational database. 1.2 Describe the SQL Server 1.3 Explain the components of SQL Server Management Studio 1.4 Create a database in SQL
Perform simple SQL queries	2.1 Create a table in SQL 2.2 Describe the SQL constraints 2.3 Perform operations by using different statements in SQL.
SQL Scripts	3.1 Write SQL scripts to perform simple transactions
SQL Views	4.1 Create SQL views by using statements and from the editor.
Stored Procedures	5.1 Create stored procedure for simple transactions
Function	6.1 Write statements by using Built-in functions 6.2 Write statements by using User- defined functions
Communication by other applications	7.1 Introduction to ODBC 7.2 Create a connection to an application 7.3 Show how to access a database from an application.

Range Statement

SQL Constraints:

- PRIMARY KEY
- NOT NULL
- UNIQUE
- FOREIGN KEY
- CHECK
- DEFAULT
- IDENTITY

SQL statements:

- CREATE
- ALTER TABLE
- INSERT INTO
- UPDATE
- DELETE
- SELECT
- JOIN

SQL Scripts

- Comments
- Variable
- Built-in Global Variables
- Flow Control

SQL Functions

- Built-in functions
 - Aggregate :
 - AVG()
 - STDEV()
 - COUNT()
 - MAX()
 - MIN()
 - SUM()
 - Scalar:
 - UPPER()
 - LOWER()
 - LEN()
 - ROUND()
 - GETDATE()
- String functions
 - CHAR
 - CHARINDEX
 - REPLACE
 - SUBSTRING
 - LEN
 - REVERSE
 - LEFT
 - RIGHT
 - LOWER
 - UPPER
 - LTRIM
 - RTRIM
- Date and Time functions
 - DATEPART
 - GETDATE

- DATEADD
- DATEDIFF
- DAY
- MONTH
- YEAR
- ISDATE
- Mathematics and Statistics Functions
 - COUNT
 - MIN
 - MAX
 - COS
 - SIN
 - TAN
 - SQRT
 - STDEV
 - MEAN
 - AVG

ASSESSMENT GUIDE

Form of assessment

The assessor will assess candidate with:

- Portfolio
- Sample codes

Assessment context

- Competency may be assessed in workplace or in a simulated workplace setting
- Assessment shall be observed while task are being undertaken whether individually or in group

Critical aspects

Assessment requires evidence that the candidate:

- Create a simple database in SQL
- Perform simple queries

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
2.1 Familiarity with data processing concepts and techniques	3.1 Basic computer operation skills
2.2 Data processing	3.2 Logic analysis
2.3 SQL concepts, syntax and flavors	3.3 Communication skills
2.4 RDBMS concepts	3.4 Code writing and debugging skills
2.5 Control database access to specific objects.	
2.6 Retrieve data by using advanced subqueries.	

Unit 22

UNIT TITLE	Authentication & Authorization: OAuth				
DESCRIPTOR	This unit provides an introduction to Authentication and Authorization. This course helps students to implement OAuth 2.0.				
CODE	SOC3oS2U12V1	LEVEL	4	CREDIT	8

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Authentication vs. Authorization	1.1 Learn the difference between authentication and authorization. 1.2 Learn how OAuth 2.0 makes implementing security easier for developers and users. 1.3 See OAuth 2.0 in action as you make API requests using Google's OAuth 2.0 Playground.
Creating a Google+ Sign-In	2.1 Learn about the different types of security flows your application can implement. 2.2 See how security can be handled by your server and your user's browser. 2.3 Add a Google+ Sign-In to an existing web application and implement a hybridized client/server flow.
Local Permission Systems	3.1 Add python code to create server-side rules that will constitute a permission system. 3.2 Limit access of the database for each logged in user based on how the developer designs this code. 3.3 Add a User model to your database to store the credentials collected from the OAuth provider's API.
Adding Facebook & Other Providers	4.1 Learn to implement multiple OAuth providers on your web application. 4.2 Add Facebook Login as an alternative sign in option for your users. 4.3 Understand how to use OAuth provider documentation to add as many providers as you see fit.

Range Statement

Authorization flows:

- Authorization code
- Implicit grant for browser-based client-side applications
- Resource owner password-based grant
- Client credentials

Tools and Libraries:

- Google's OAuth 2.0 Playground
- Apigee's Console
- Facebook's Access Token Tool and Access Token Debugger

ASSESSMENT GUIDE

Form of assessment

Competency may be assessed through:

- Demonstration with questioning
- Observation with questioning
- Third party report
- Assessment of produced documents

Assessment context

- Competency may be assessed in workplace or in a simulated workplace setting
- Assessment shall be observed while task are being undertaken whether individually or in group

Critical aspects

Assessment requires evidence that the candidate:

- Explain the difference between Authentication and Authorization
- Implement OAuth 2.0 on a platform

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Difference between Authentication and Authorization• Local permission systems• OAuth 2.0	<ul style="list-style-type: none">• Basic computer operation skills• Logic analysis• Communication skills• Code writing and debugging skills

Unit 23

UNIT TITLE	Full Stack Foundations				
DESCRIPTOR	This unit provides a foundation for the students on full stack development. It also familiarizes the students on web frameworks				
CODE	SOC30S2U13V1	LEVEL	4	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
Working with the CRUD	1.1 Learn about CRUD; Create, Read, Update, and Delete. 1.2 Implement CRUD operations on a database. 1.3 Use an ORM (Object-Relational Mapping) as an alternative to SQL.
Making a Web Server	2.1 Build a web server from scratch using Python and some pre-installed libraries. 2.2 Learn how GET and POST requests can retrieve and modify information on a web site. 2.3 How to add CRUD functionality to our website.
Developing with Framework	3.1 Introduction to web frameworks like Django and Ruby on Rails. 3.2 Use the Flask web framework to develop our own web application. 3.3 Introduction to APIs and how to add JSON endpoints to our application.
Iterative Development	4.1 Build an entire web application on your own. 4.2 Learn about the iterative development process. 4.3 Have a working prototype throughout all stages of the development process.

Range Statement**ASSESSMENT GUIDE****Form of assessment**

Competency may be assessed through:

- Demonstration with questioning
- Observation with questioning

- Third party report
- Assessment of produced documents

Assessment context

- Competency may be assessed in workplace or in a simulated workplace setting
- Assessment shall be observed while task are being undertaken whether individually or in group

Critical aspects

Assessment requires evidence that the candidate:

- Build a web application

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• CRUD• Web frameworks	<ul style="list-style-type: none">• Basic computer operation skills• Logic analysis• Communication skills• Code writing and debugging skills