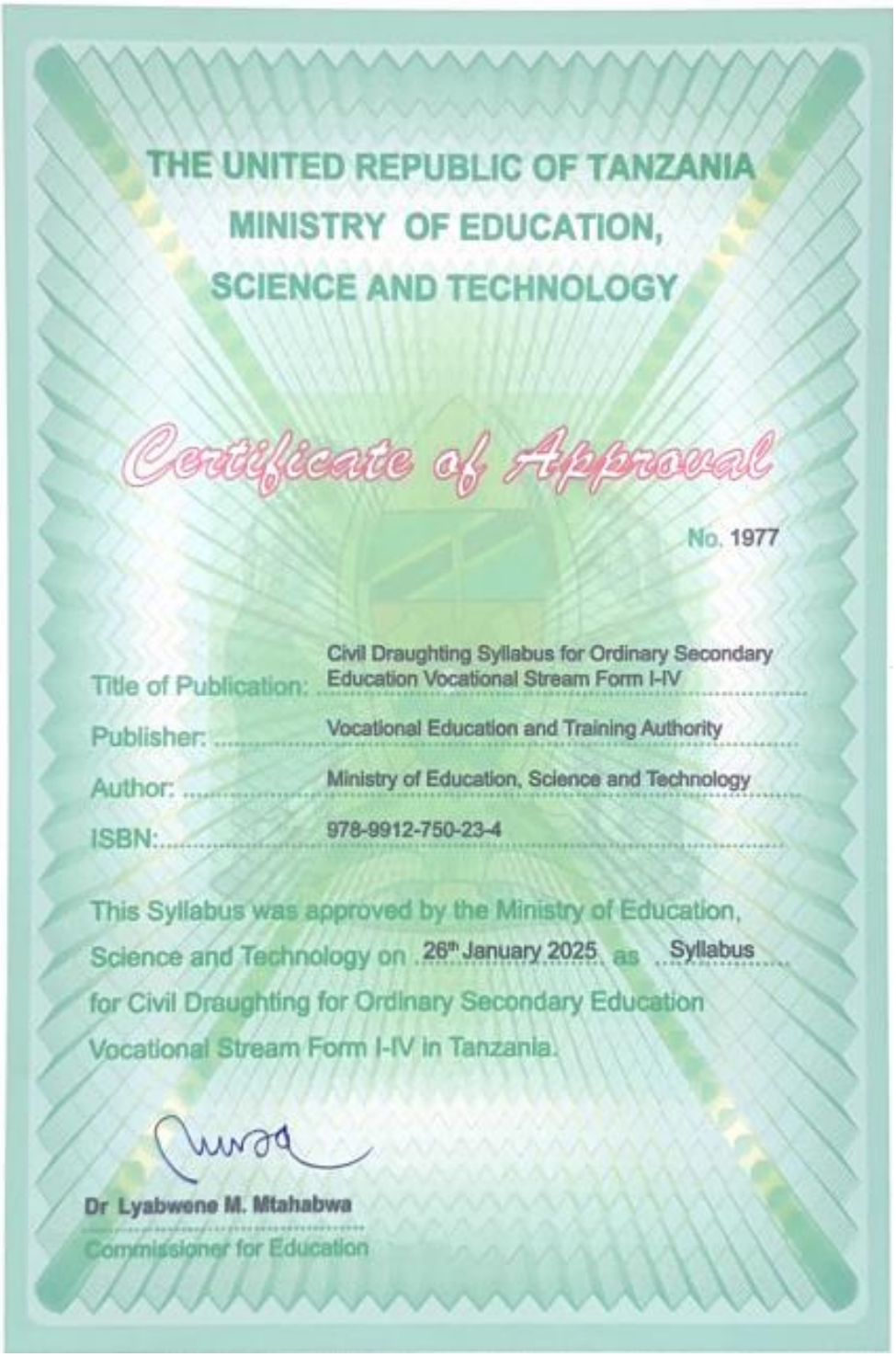
THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE, AND TECHNOLOGY



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Dr Lyabwene M. Mtahabwa
Commissioner for Education

CIVIL DRAUGHTING SYLLABUS FOR ORDINARY SECONDARY EDUCATION VOCATIONAL STREAM FORM I-IV

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Table of Contents

1.0. Table of Contents

List of Tables

Abbreviations and Acronyms

CAD	Computer Added Designing
OUS	Occupational Unit Standards
RCC	Reinforced Cement Concrete
3D	Three Dimensional
VETA	Vocational Education and Training Authority
CA	Continuous Assessment
OUS	Occupational Unit Standards
NGO	Non-Governmental Organisations

Definition of Key Terms

Assessment: The process of collecting evidence and making judgments on whether competence has been achieved, or whether specific skills and knowledge have been achieved that will lead to the attainment of competence.

Assessment: The process of collecting evidence and making judgments on whether competence has been achieved, or whether specific skills and knowledge have been achieved that will lead to the attainment of competence.

Circumstantial knowledge: Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.

Competence: The ability to use knowledge, understanding, practical and thinking skills to perform effectively to the workplace standards required in employment.

Element: A sub- unit (step), which reflects learning sequence with the aim of achieving broad learning objectives of a unit.

Performance criteria: indicate the expected end results or outcome in form of evaluative statements.

Standard: A set of statements, which if proved true under working conditions, means that an individual is meeting an expected level and type of performance.

Unit: A statement of broad learning objectives, which prescribe the requirements of a standard in form of practical skills, knowledge and appropriate attitudes.

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For and on behalf of:

Vocational Education and Training Authority

CPA. Anthony M. Kasore

Director General

1.0. Introduction

Civil Draughting is one of the key occupations offered in the Ordinary Secondary Education Vocational Stream. Its importance stems from the growing demands of Tanzania's expanding construction industry, which requires skilled professionals. By studying Civil Draughting, students gain practical skills such as using computer-aided design (CAD) software to create building drawings, preparing basic construction cost estimates, and managing construction projects and site environments. Training artisans in Civil Draughting with an emphasis on environmental consciousness supports the sustainable development of the construction industry. This, in turn, fosters economic growth, generates employment opportunities, promotes environmental sustainability, and preserves cultural heritage. Upon completion of the program, students will possess both theoretical and practical knowledge of Civil Draughting.

The Civil Draughting syllabus is designed to guide the teaching and learning of Civil Draughting in the Ordinary Secondary Education Form I–IV Vocational Stream in the United Republic of Tanzania. It outlines the competences students need to develop while studying Civil Draughting. The syllabus provides essential information to help teachers effectively plan their lessons and support learners in achieving the intended competences.

2.0. Main Objectives of Education in Tanzania

The main objectives of education in Tanzania are to enable every Tanzanian to:

(a) Develop and improve his or her personality so that he or she values himself or herself and develops self-confidence;

(b) Respect the culture, traditions, norms and customs; cultural differences; dignity; human rights; attitudes and inclusive actions;

(c) Advance knowledge and apply science and technology, creativity, critical thinking, innovation, cooperation, communication and positive attitudes for his or her own development and the sustainable development of the nation and the world at large;

(d) Understand and protect national values, including dignity, patriotism, integrity, unity, transparency, honesty, accountability and the national language;

(e) Develop life and work-related skills to increase efficiency in everyday life;

(f) Develop a habit of loving and valuing work to increase productivity and efficiency in production and service provision;

(g) Identify and consider cross-cutting issues, including the health and well-being of the society, gender equality, as well as the management and sustainable conservation of the environment; and

(h) Develop national and international cooperation, peace and justice per the Constitution of the United Republic of Tanzania and international conventions.

3.0 General Competences for Ordinary Secondary Education Vocational Stream

The general competences for Ordinary Secondary Education, Form 1–IV, Vocational Education stream are to:

(a) Apply the knowledge, skills and attitudes the student developed in the primary school stage to increase his/her understanding of technical skills;

(b) Appreciate citizenship and national virtues;

(c) Use language skills;

(d) Demonstrate self-confidence in learning in various fields, including science and technology, technical knowledge and technical skills;

(e) Apply technical knowledge and skills in designing, discovering and making various things to solve challenges in society, including cross cutting issues;

(f) Appreciate procedures and safety rules in using technical tools correctly; and

(g) Apply the technical knowledge and skills acquired to develop oneself with vocational and technical education and join the workforce.

4.0 General Competences of the Occupation

Upon completion of this occupation training, students are expected to have ability to:

(a) Maintain personal safety, workshop and equipment;

(b) Prepare architectural, structural and service drawings;

(c) Make models;

(d) Apply computer aided design (CAD) software to prepare building drawings;

(e) Prepare basic building cost estimate;

(f) Manage site and administrative works;

(g) Adapt construction techniques and methods in buildings construction.

5.0 Main and Specific Competences

The main and specific competences to be developed are presented in Table 1

Table 1: *Main and Specific Competences for Form I-IV*

Modules (Main Competence)	**Units (Specific competences)**
1.0 Maintaining safety of workshop and surroundings	1.1. Maintaining workshop safety 1.2. Handling accidents and incidents 1.3. Handling fire accidents 1.4. Performing first aid 1.5. Maintaining workshop environments
2.0 Preventive maintenance of tools and equipment	2.1. Maintaining tools and equipment
3.0 Performing technical drawing	3.1. Performing technical drawings 3.2. Applying scaling
4.0 Identifying building materials	4.1. Identifying binding materials 4.2. Identifying structural building materials 4.3. Identifying glass and plastic materials 4.4. Identifying paints
5.0 Producing basic building drawings	5.1. Producing architectural drawings 5.2. Writing specifications
6.0 Adapting building construction technologies	6.1. Adapting building construction techniques 6.2. Preparing openings assembly details 6.3. Installing building services
7.0 Performing physical building measurements	7.1. Carrying out physical building measurements 7.2. Preparing measured drawings and documentation
8.0 Producing working drawings by using CAD software	8.1. Applying computer aided design in producing working drawings 8.2. Producing architectural drawings 8.3. Preparing Services drawings and layouts 8.4. Making models
9.0 Preparing structural detailed drawings	9.1. Preparing building structural detailed drawings 9.2. Preparing steel bending schedules
10.0 Performing architectural design	10.1. Performing basic design procedures 10.2. Preparing sketch designs by using CAD software 10.3. Preparing architectural brief 10.4. Performing building refurbishment

Modules (Main Competence)	Units (Specific competences)
11.0 Performing architectural practice and regulations	11.1. Applying building law
12.0 Performing building estimates and costing	12.1.Preparing building estimates 12.2.Performing cost estimates
13.0 Performing construction management practice	13.1.Performing site works 13.2.Performing site survey 13.3.Managing personal and environment safety 13.4.Carrying out administrative tasks at site 13.5.Carrying out risk assessment 13.6.Managing environmental pollution
14.0 Managing preventive maintenance	14.1. Planning preventive maintenance 14.2.Supervising preventive maintenance

6.0. The Roles of Teachers, Students and Parents in Teaching and Learning

Good relationship between a teacher, student, and parent, or guardian is fundamental to ensuring successful learning. This section outlines the roles of each participant in facilitating effective teaching and learning of Civil Draughting.

6.1 The Teacher

The teacher is expected to:

(a) Help the student to learn and develop the intended competences in Civil Drafting;

(b) Use teaching and learning approaches that will allow students with different needs and abilities to:

(c) Develops the competences needed in the 21st Century;

(d) Actively participate in the teaching and learning process.

(e) Use student centred instructional strategies that make the student a centre of learning which allow them to think, reflect and search for information from various sources;

(f) Create a friendly teaching and learning environment;

(g) Prepare and improvise teaching and learning resources;

(h) Conduct formative assessment regularly by using tools and methods which assess theory and practice;

(i) Treat all the students according to their learning needs and abilities;

(j) Protect the student from the risky environment while he or she is at school;

(k) Keep track of the student's daily progress;

(l) Identify individual student's needs and provide the proper intervention;

(m) Involve parents/guardians and the society at large in the student's learning process; and

(n) Integrate cross-cutting issues and ICT in the teaching and learning process.

6.2 The student

The student is expected to:

(a) Develop the intended competences by participating actively in various learning activities inside and outside the classroom; and

(b) Participate in the search for knowledge from various sources, including textbooks, reference books and other publications in online libraries.

6.3 The Parent/Guardian

The parents/guardian is expected to:

(a) Monitor the child's academic progress ;

(b) Where possible, provide a child with the needed academic support;

(c) Provide a child with a safe and friendly home environment which is conducive for learning;

(d) Keep track of a child's progress in behaviour;

(e) Provide the child with any necessary materials required in the learning process; and

(f) Instil in a child a sense of commitment and positive value towards education and work.

7.0. Teaching and Learning Methods

The teaching and learning methods play a vital role in developing students' competences. This syllabus suggests various methods for each activity, including, but not limited to, demonstrations, practical/hands-on activities, observations, role play, simulations, group work, peer teaching and learning, discussions, presentations, field visits, research, and project work. Teachers are encouraged to plan and employ additional appropriate methods based on the specific environment or context. All teaching and learning methods should be closely integrated with the students' everyday lives. The focus should prioritise practical application and the development of cognitive, affective, and psychomotor skills through learner-centred approaches. Vocational teachers serve as facilitators, combining school-based teaching with project work supervision.

8.0. Teaching and Learning Resources

The teaching and learning process requires a variety of resources. In this regard, both teachers and students should collaborate to gather or improvise alternative resources available in the school and home environments as needed. They are also expected to actively seek information from various sources to enhance the effectiveness of the teaching and learning process. A list of approved textbooks and reference materials will be provided by the Tanzania Institute of Education (TIE).

9.0. Assessment

Assessment is important in teaching and learning of Civil Draughting occupation. It is divided into formative and summative assessments. Formative assessment provides feedback to teachers and students on the progress of teaching and learning and assists in making decisions to improve the teaching and learning process. Teachers are, therefore, expected to apply a wide range of formative assessment methods, including demonstrations, discussions, presentations, oral questions, experiments, observations, practical assignments, and projects. Summative assessment, on the other hand, will focus on determining students' achievement of learning. Teachers are expected to use a variety of summative assessments, such as the Form Two National Assessment, terminal examinations, annual examinations, mock examinations, and projects. The scores obtained from these assessments will be used as Continuous Assessment (CA). Continuous assessments will contribute 60%, while the National Form IV Examination will account for 40%, as indicated in Table 2.

Project Work

Project work is a carefully planned and clearly defined task or problem that a student undertakes, either individually or in a group, to enhance and apply the skills and knowledge gained in the classroom, workshop, kitchen, or laboratory. It is grounded in the principles of Learning by Doing and Learning by Living. In this context, the implementation of project work in the vocational streams of secondary schools is essential. Projects within the vocational stream should be conducted in the core subject (occupation). To ensure success, the supervision and assessment of student project work must adhere to the established guidelines provided by the National Examinations Council of Tanzania (NECTA).

Table 2: *Contribution of Continuous Assessment and National Examination in the final score*

Assessment Category	Weight (%)	National Examination
Form Two National Assessment (FTNA)	6.0	**40.0**
Form Three Terminal Examination	5.0	
Form Three Annual Examination	5.0	
Form Four Mock Examination	7.0	
Project	7.0	
Form Two Practical	10.0	
Form Three Practical	10.0	
Form Four Practical	10.0	
Total	**60.0**	

10.0. Number of Periods

The Civil Draughting Syllabus for Ordinary Secondary Education Vocational Stream Form I–IV provides time estimates for teaching and learning each specific competence. These estimates take into account the complexity of the competences and the associated learning activities. A total of eight (8) periods of 40 minutes each have been allocated per week, with two (2) periods designated for theory and six (6) for practical sessions, which may require double periods (e.g., 80 minutes). Double periods allow sufficient time for hands-on activities.

11.0. Teaching and Learning Contents

The contents of the syllabus are organised into a matrix with seven (07) columns: main competences, specific competences, learning activities, suggested teaching and learning methods, assessment criteria (which is divided into process assessment, products/service assessment, and underpinning knowledge), suggested teaching and learning resources, and number of periods as, presented in Table 3 to 6.

Form One

Table 3: *Detailed contents for Form One*

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
1. Maintaining Safety of Workshop and Surroundings	1.1. Maintaining Workshop Safety	a) Maintaining workshop safety rules and regulations	**Brainstorming:** Guide the students to brainstorm on the concepts of workshop safety **Group discussion:** Guide the students in manageable groups to discuss and come up with the importance of workshop safety **Individual assignment:** Assign each student the task of explaining how to maintain workshop safety rules and regulations	**The student should be able to:** • Select relevant safety gear • Maintain workshop safety • Identify causes of health and safety hazards in a workshop and its surroundings • Take precaution against health and safety hazards • Interpret different safety signs in the workshop • Draw safety signs • Maintain safe working environment • Maintain personal environments • Clean workshop, tools,	Safety of workshop and tools maintained as per safety rules and regulations	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: • Maintain workshop safety rules and regulations • Dispose different types of wastes **Principles:** The student should explain principles of: • Importance of maintaining workshop • Storing different types of tools and equipment **Theories:** The student should explain:	The following tools, equipment, and safety gear are to be available: • Safety boots • Gloves • Overalls • Soap • Hoe • Broom • Brush • Safety gear (PPE) • Dust covers • Dust mask • Dustbins • Slasher • Workshop safety rules and regulations charts • Student cleaning roaster	33

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Feedback: Provide feedback to students on their tasks and introduce the next topic	equipment, and workshop surroundings • Store equipment and safety gear • Use safety gear • Dispose different types of wastes as per OHS		• Importance of maintaining workshop safety rules and regulations • Classification of wastes and their hazards **Circumstantial knowledge** **Detailed knowledge about:** • Safe working practices when working in the workshop • Workshop rules and regulations		
		b) Maintaining workshop working environment	**Brainstorming:** Guide the students to brainstorm on the concepts of workshop working environment **Practical:** Demonstrate to student on how to organise working environment in a proper layout	**The student should be able to:** • Select relevant safety gear • Maintain workshop • Interpret different safety signs in the workshop • Draw safety signs • Maintain safe working environment • Clean workshop,	Workshop working environment maintained as per safety rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Maintaining workshop working environment **Principles:** The student should explain principles involved in:	The following tools, equipment, and safety gear are to be available: • Safety boots • Gloves • Overalls • Cleaning materials • Hoe • Broom • Brush • Safety gear (PPE) • Dust covers • Dust mask • Dustbins	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Activity: Assign the students to small groups to organise a Civil Draughting workshop following instructions aligned with Engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	tools, equipment, and workshop surroundings • Store equipment and safety gear • Use safety gear • Dispose different types of wastes as per OHS		Maintaining workshop working environment **Theories:** The student should explain importance of: • Maintaining workshop working environment • Methods of disposing different types of wastes **Circumstantial knowledge** **Detailed knowledge about:** • Observe personal protection when maintaining workshop environment • Safe working practices • Waste disposal procedures • Workshop rules and regulations		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		c) Maintaining personal safety	**Brainstorming:** Guide the students to brainstorm the meaning of personal safety **Group discussion:** Guide the students in manageable groups to discuss ways to maintain personal safety **Individual assignment:** Assign each student the task of explaining how to maintain personal safety according to the required standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Select relevant safety gear • Identify causes of health and safety hazards in a workshop and its surroundings • Take precaution against health and safety hazards • Interpret different safety signs in the workshop • Draw safety signs • Maintain safe working environment • Maintain personal environments • Clean workshop, tools, equipment, and workshop surroundings • Store equipment and safety gear • Use safety gear • Dispose	Safety of workshop and tools maintained as per safety rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Maintaining personal safety **Principles:** The student should explain principles involved in: • Maintaining personal safety **Theories:** The student should explain: Importance of maintaining personal safety **Circumstantial knowledge** **Detailed knowledge about:** • OSHA rules and regulations • Observe personal safety protection • Waste disposal procedures • Workshop	The following tools, equipment, and safety gear are to be available: • Safety boots • Gloves • Overalls • Cleaning materials • Hoe • Broom • Brush • Safety gear (PPE) • Dust covers • Dust mask • Dustbins	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				different types of wastes as per OSHA		rules and regulations		
		d) Maintaining safety gear	**Brainstorming:** Guide the students to brainstorm the meaning of safety gears **Group discussion:** Guide students in manageable groups to discuss and identify the importance of maintaining safety gear **Activity:** Assign the students the task of identifying safety gear according to the standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Select relevant safety gear • Use safety gear • Maintain safety gear • Store equipment and safety gear	Safety gear maintained as per safety rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Maintain safety gear **Principles:** The student should explain principles of: • Storing different types of tools and equipment **Theories:** The student should explain importance of: • Wearing safety gears **Circumstantial knowledge** **Detailed knowledge about:** • OSHA rules and regulations • Safe working	The following tools, equipment, and safety gear are to be available: • Safety boots • Gloves • Overalls • Cleaning materials • Brush • Safety gear (PPE) • Dust covers • Dust mask • Dustbins	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						practices • Waste disposal procedures • Workshop rules and regulations		
	1.2. Handling Accidents and Incidents	a) Handling mechanical hazards	**Brainstorming:** Guide the students to brainstorm the meaning of mechanical hazard **Activity:** Assign the students to walk around the school compound to identify possible mechanical hazards **Individual assignment:** Assign each student the task of demonstrating or explaining the proper handling of mechanical hazards as per	**The student should be able to:** • Identify the causes of mechanical hazards • Inspect tools and equipment before starting the machine • Use service manual • Interpret workshop rules and regulations • Respond correctly and safely when faced with an emergency • Identify and use all emergency equipment and supplies appropriately • Locate first aid kit	mechanical hazards handled as per safety rules	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Handle hazardous materials **Principles:** The student should explain the principles of: • Handling hazardous materials • Emergency life support **Theories:** The student should explain importance of: Handling mechanical hazards • Wearing PPE against	The following tools, equipment, and safety gear are to be available: • Power machine • Overalls • Rubber gloves • Gloves • Safety boots • Clear safety glasses • First aid kit • First aid poster • Helmet • Gloves • Earplugs • Mask • Overall • Workshop rules and regulations • Service manual	33

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Make periodic inspection of workshop area and equipment • Identify hazardous materials • Use safety gear • Clean tools, equipment, and workplace • Store tools and equipment		• Understanding the usage of colour codes and safety signs **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling accidents and incidents • Safe handling of tools, equipment, and machines • Waste disposal methods		
		b) Handling physical hazards	**Brainstorming:** Guide the students to brainstorm the meaning of physical hazards **Activity:** Assign the students to walk around the school compound to identify possible	**The student should be able to:** • Identify Physical hazards • Use service manual • Interpret workshop rules and regulations • Respond correctly and safely when faced with an emergency	Check if students appropriately handle machines, equipment, and chemical accidents and incidents, according to workshop rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Identify sources of physical hazards • handle physical hazards	The following tools, equipment, and safety gear are to be available: • Tool kit • Power machines • Overalls • Rubber gloves • Gloves • Safety boots • Clear safety glasses • First aid kit • Helmet • Earplugs Mask • Workshop rules and	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			physical hazards **Individual assignment:** Assign each student the task of explaining how to handle physical hazards in line with engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Identify and use all emergency equipment and supplies • Locate first aid kit • Make periodic inspection of workshop area and equipment • Identify hazardous materials • Use colour code and know what each colour represents • Follow good environmental practices		**Principles:** The student should explain the principles of: • Classifying hazards • Handling hazardous materials • Identifying hazardous materials • Emergency life support **Theories:** The student should explain: • Effects of physicals hazards to human being • Emergency life support for unconscious person • Importance of using safety gears **Circumstantial knowledge** **Detailed knowledge about:** • Safety	regulations • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						measures to control physical hazards • Safe handling of tools, equipment, and machines • Waste disposal methods		
		c) Handling chemical hazards	**Brainstorming:** Guide the students to brainstorm the meaning of chemical hazards **Activity:** Assign the students to identify possible chemical hazards in civil draughting workshop **Individual assignment:** Assign each student the task of explaining how to handle chemical hazards in accordance	**The student should be able to:** • Identify chemical hazards • Interpret workshop rules and regulations • Respond correctly and safely when faced with a n emergency • Identify and use all emergency equipment and supplies • Locate first aid kit • Make periodic inspection of workshop area and equipment • Handle	Machines, equipment, and chemicals, as well as accidents and incidents are handled, according to workshop rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Identify hazardous materials • Handle chemical hazards • Use safety gears • Use colour code and safety signs • Assist an accident victim • Label all chemical container in	The following tools, equipment, and safety gear are to be available: • Tool kit • Fire extinguisher • Power machines • Overalls • Rubber gloves • Gloves • Safety boots • Clear safety glasses • First aid kit • First aid poster • Helmet • Earplugs Mask • Workshop rules and regulations • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			with engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	hazardous materials • Use colour code and know what each colour represents • Follow good environmental practices • Use safety gear • Clean tools, equipment, and workplace • Store tools and equipment		workshop • Carry out first aid • Respond correctly and safely when faced with emergency **Principles:** The student should explain the principles of: • Handling chemical hazards • Emergency life support **Theories:** The student should explain: • Effects of chemical hazards • Importance of using safety gears **Circumstantial knowledge** **Detailed knowledge about:** • State safety precautions while handling chemical to		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						avoid chemical hazards accidents and incidents • Safe handling of tools, equipment, and machines • Waste disposal methods • Respiratory and circulatory systems		
		d) Handling electrical hazards	**Brainstorming:** Guide the students to brainstorm the meaning of electrical hazards **Activity:** Assign the students to identify electrical hazards in civil draughting workshop **Individual assignment:** Assign each student the task	**The student should be able to:** • Administer first aid to person involved in accidents related to electrical hazards • Use service manual • Interpret workshop rules and regulations • Respond correctly and safely when faced with a n emergency • Identify and use all emergency	Electrical hazards handled according to workshop rules and regulations	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: • Identify hazardous materials • Handle electrical hazards **Principles:** The student should explain the principles of: • De-energize the power when need to	The following tools, equipment, and safety gear are to be available: • Tool kit • Fire extinguisher • Power machines • Overalls • Rubber gloves • Gloves • Safety boots • Clear safety glasses • First aid kit • First aid poster • Helmet • Earplugs • Mask • Workshop rules and regulations	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			of explaining how to handle electrical hazards in accordance with engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	equipment and supplies • Locate first aid kit • Administer artificial respiration • Take necessary steps to save the victim • Make periodic inspection of workshop area and equipment • Identify hazardous materials • Handle hazardous materials • Use colour code and know what each colour represents • Handle electrical hazards • Follow the rules for handling compressed air • Follow good environmental practices • Handle machines		perform maintenance • Handling hazardous materials • Identifying hazardous materials • Emergency life support **Theories:** The student should explain: • Effects of electrical hazards • Importance of using safety gears while working with electric circuits **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling accidents and incidents • Safe handling of tools, equipment,	• Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				• Use safety gear • Clean tools, equipment, and workplace Store tools and equipment		and machines • Waste disposal methods • Respiratory and circulatory systems		
		e) Handling ergonomic hazards	**Brainstorming:** Guide the students to brainstorm the meaning of ergonomic **Activity:** Assign the students to identify possible causes of ergonomics in civil draughting workshop **Individual assignment:** Assign each student the task of explaining how to handle ergonomic hazards in accordance with engineering standards	**The student should be able to:** • Administer first aid to person involved in accidents related to chemical, electrical, physical, mechanical, and ergonomic hazards • Use service manual • Interpret workshop rules and regulations • Respond correctly and safely when faced with an emergency • Identify and use all emergency equipment and supplies • Locate first aid	Machines, equipment, and chemicals as well as accidents and incidents are handled, according to workshop rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Identify hazardous materials • Handle hazardous materials • Use safety gears • Use colour code and safety signs • Assist an accident victim • Assist an unconscious victim • Assist a fire victim • Carry out first	The following tools, equipment, and safety gear are to be available: • Tool kit • Fire extinguisher • Power Machines • Overalls • Rubber gloves • Gloves • Safety boots • Clear safety glasses First aid kit • First aid poster • Helmet Earplugs • Mask • Workshop rules and regulations • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Feedback: Provide feedback to students on their tasks and introduce the next topic	kit • Administer artificial respiration • Take necessary steps to save the victim • Report to superiors • Record accidents • Make periodic inspection of workshop area and equipment • Identify hazardous materials • Handle hazardous materials • Use colour code and know what each colour represents • Handle mechanical and electrical equipment • Follow the rules for handling compressed air • Follow good environmental		aid • Respond correctly and safely when faced with emergency **Principles:** The student should explain the principles of: • Classifying hazards • Handling hazardous materials • Identifying hazardous materials • Cardio pulmonary resuscitation • resuscitation • Emergency life support **Theories:** The student should explain: • Effects of mechanical, chemicals, and physicals hazards • Emergency life support		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				practices • Handle machines • Use safety gear • Clean tools, equipment, and workplace • Store tools and equipment		• Treatment for electric shock • Treatment for burns • Treatment for fractures • Treatment for an unconscious person • Importance of using safety gears • Advantages of accidents preventions • Usage of colour code and safety signs • Reading manufacturer's instruction before operating machine **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling accidents and		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						incidents • Safe handling of tools, equipment, and machines • Waste disposal methods • Respiratory and circulatory systems • Basic functions of the human body		
	1.3. Handling Fire Accidents	a)Handling different types of fire	**Brainstorming:** Guide the students to brainstorm on the concept of fire **Activity:** Assign the students to identify combustible materials **Individual assignment:** Assign each student the task of differentiating between types of	**The student should be able to:** • Identify combustible le materials • Group combustible materials according to their nature • Identify types of fire according to the fuels	Type fire identified as per instructions	**Knowledge evidence: Detailed knowledge of: Method used:** The Student should explain how to: • Identify different types of fire extinguishers • Use the appropriate type of fire extinguishers • Use	The following tools, equipment, and safety gear are to be available: • Fire fighting rules and regulations • Workshop rules and regulations • Fire extinguishers • firefighting materials • First aid kit • Gloves • Safety boots • Overalls Clear safety glasses	33

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			fire **Feedback:** Provide feedback to students on their tasks and introduce the next topic			appropriate type of firefighting materials **Principles:** The student should explain the principles of: • Identifying different types of fire extinguishers • Checking and testing fire extinguishers • Using appropriate class of fire extinguishers **Theories:** The student should explain: • Importance of handling fire accidents • Types and common classes of fire • Handle different types of fire • Importance of		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						checking and servicing fire extinguishers • Importance of differentiating fire fighting materials **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling fire accidents • Safe handling of tools and equipment • Waste disposal methods		
		b) Handling firefighting equipment and materials	**Brainstorming:** Guide the students to identify firefighting equipment **Practical:** Demonstrate to the student how to fight different types of fire	**The student should be able to:** • Select tools, equipment, and safety gear • Identify common classes of fire • Use first aid kit • Respond correctly and safely when faced with	Fire accidents handled as per rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Identify different types of fire extinguishers • Use the	The following tools, equipment, and safety gear are to be available: • Fire fighting rules and regulations • Workshop rules and regulations • Fire extinguishers • Firefighting materials • First aid kit • Gloves • Safety boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Activity: Guide the students in manageable groups to fight different types of fire **Individual assignment:** Assign each student the task of explaining how to handle firefighting equipment and materials **Feedback:** Provide feedback to students on their tasks and introduce the next topic	different types of fire • Use the appropriate class of fire extinguisher • Handle different types of fire • Apply right class of firefighting materials • Check and test fire extinguishers • Clean up tools, equipment and working place Store tools, equipment, and safety gear		appropriate type of fire extinguisher • Use appropriate type of firefighting materials **Principles:** The student should explain the principles of: • Identifying different types of fire extinguishers • Checking and testing fire extinguishers • Using appropriate class of fire extinguishers **Theories:** The student should explain: • Importance of handling fire accidents • Types and common classes of fire	• Overalls Clear safety glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Handle different types of fire • Importance of checking and servicing fire extinguishers • Importance of differentiating fire fighting materials **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling fire accidents • Safe handling of tools and equipment • Waste disposal methods		
	1.4. Providing First Aid	a) Performing artificial respiration	**Brainstorming:** Guide the students to discuss the meaning of first aid, first aid kit, and artificial respiration	**The student should be able to:** • Select tools and equipment • Identify types of injuries • Perform artificial respiration	First aid offered conforms to medical requirements.	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to perform first aid **Principles:** The	The following tools, equipment, and safety gear are to be available: • First aid kit • Stretcher • Sterilizer • Towel • Overalls • Medical gloves	33

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Practical: Demonstrate to students on how to perform artificial respiration through chest compression **Activity:** Assign the students in manageable groups to artificial respiration through chest compression **Individual assignment:** Assign each student the task of explaining how to perform artificial respiration through chest compressions **Feedback:** Provide feedback to students on their tasks and introduce the	• Attend minor wounds • Sterilize first aid tools • Observe safety precautions • Store first aid kit		student should explain principles of: • Performing artificial respiration • Attending minor wounds • Providing first aid **Theories:** The student should explain: • Different types of wounds • Different types of accidents • Types of artificial respiration • The use of different accessories in a first aid kit • Importance of first aid **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions to be observed		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			next topic			while performing first aid • Safe handling of first aid kit • Waste disposal		
		b) Performing first aid to minor wounds and scalpels	**Brainstorming:** Guide the students to distinguish wounds from scalpels **Activity:** Assign the students in manageable groups to identify steps for providing first aid to minor wounds and scalpels **Individual assignment:** Assign each student the task of performing artificial respiration through chest compressions	**The student should be able to:** • Identify the wound and scalpels • Select first aid items • State procedures for providing first aid • Provide first aid • Sterilize used items • Store first aid items in first aid kit	First aid offered conforms to medical requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to perform first aid to minor wounds and scalpels **Principles:** The student should explain principles involved in: Performing first aid to minor wounds and scalpels **Theories:** The student should explain: • The importance of providing first aid • The use of different accessories in	The following tools, equipment, and safety gear are to be available: • First aid kit • Stretcher • Sterilizer • Towel • Overalls • Medical gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Feedback: Provide feedback to students on their tasks and introduce the next topic			a first aid kit **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions to be observed while performing first aid • Safe handling of first aid kit • Waste disposal		
	1.5. Maintaining Workshop Environments	a) Managing environmental pollution	**Brainstorming:** Guide the students to explain meaning of environment and environmental pollution **Activity:** Assign the students in manageable groups to walk around school compound to identify sources of environmental pollution	• The student should be able to: • Select relevant safety gear • Maintain safe working environment • Maintain personal safety • Select proper waste disposal • Select tools and equipment • Maintain environment safety • Observe safety precautions • Clean and store	Environmental pollution managed as per required standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to maintain environment **Principles:** The student should explain principles of: • Maintaining compliance with environmental pollution standards • Maintaining	The following tools, equipment, and safety gear are to be available: • Dustbin • Rack • Chalk board/White board • Pictures /charts	37

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Individual assignment: Assign each student the task of performing first aid for minor wounds and scalpels **Feedback:** Provide feedback to students on their tasks and introduce the next topic	tools at proper custody		sustainable construction practices **Theories:** The student should explain: • Environment pollution standards • Types of environment issues/pollutions **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions to be observed while performing environmental issues • Safe handling of first aid kit • Waste disposal		
		b) Maintaining safe waste disposal	**Brainstorming:** Guide the students to explain meaning of waste disposal	**The student should be able to:** • Select relevant safety gear • Maintain safe working	Waste disposed as per required standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should	The following tools, equipment, and safety gear are to be available: • Dustbin • Rack	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Practical: Demonstrate to the students the methods of waste disposal **Activity:** Assign the students in manageable groups to identify type of wastes and disposing methods **Individual assignment:** Assign each student the task of explaining how to maintain safe waste disposal as per safety standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	environment • Maintain personal safety • Select proper waste disposal • Select tools and equipment • Maintain environment • Observe safety precautions • Clean and store tools at proper custody		explain how to maintain environment **Principles:** The student should explain principles of: • Maintaining compliance with environmental pollution standards • Maintaining sustainable construction practices **Theories:** The student should explain: • Environment • Types of environment issues **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions to be observed while addressing	• Chalk board/White board	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						environmental issues • Safe handling of first aid kit • Waste disposal		
2. Performing preventive maintenance of tools and equipment	2.1. Maintaining Tools and Equipment	(a) Maintaining cutting tools	**Brainstorming:** Guide the students to identify cutting tools **Practical:** Demonstrate to students on how to maintain cutting tools **Activity:** Assign the students in manageable groups to maintain cutting tools **Individual assignment:** Assign each student the task of explaining how to maintain cutting tools **Feedback:** Provide feedback	**The student should be able to:** • Re-sharpening and oil/grease cutting tools • Store different types of tools safely • Handle different types of tools safely • Identify faults at early stages	Cutting tools maintained as per manufacturer's specification	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain different procedures of maintaining tools **Principles:** The student should explain principles involved in: Maintaining workshop tools **Theories:** The student should explain: • Types of maintenance • Steps of sharpening • Types of greasing • Oiling • Importance of maintaining tools • Maintenance	The following tools, equipment, and safety gear are to be available: • Masonry cutting tools • Masonry laying tools • Masonry measuring tools • Masonry finishing tools • Oil can, grease gun • Brushes (1" – 4") • Safety boots • Helmet • Gloves • Overalls	97

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			to students on their tasks and introduce the next topic			schedules • Types of tools and their uses **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions when maintaining various tools • Environmental issues • First aid		
		(b) Maintaining measuring tools	**Brainstorming:** Guide the students to explain the meaning of measurements, and identify measuring tools **Practical:** Demonstrate to students on how to maintain measuring tools **Activity:** Assign the students in manageable	**The student should be able to:** • Store different types of measuring tools safely • Handle different types of tools safely • Identify faults at early stages	Measuring tools maintained as per standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain different procedures of maintaining measuring tools **Principles:** The student should explain principles involved in maintaining measuring tools **Theories:** The student should explain:	The following tools, equipment, and safety gear are to be available: • Tape measures • Ruler • Laser measuring device	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			groups to maintain measuring tools **Individual assignment:** Assign each student the task of explaining how to maintain measuring tools **Feedback:** Provide feedback to students on their tasks and introduce the next topic			• Importance of maintaining measuring tools **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions when maintaining measuring tools		
		(c) Maintaining drawing tools	**Brainstorming:** Guide the students to identify drawing tools **Practical:** Demonstrate to students on how to maintain drawing tools **Activity:** Assign the students in manageable	**The student should be able to:** • Re-sharpening and oil/grease cutting tools • Store different types of tools safely • Handle different types of drawing tools safely • Identify faults at early stages • Wipe out and dusting always • Perform regular	Drawing tools maintained as per standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain different procedures of maintaining drawing tools **Principles:** The student should explain principles involved in maintaining workshop tools	The following tools, equipment, and safety gear are to be available: • Drawing board • Clutch pencil • Tee square • Scale rule • Stencils • Set squares • Eraser • Drawing paper • Masking tape • Ink pen (drafting)	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			groups to maintain drawing tools **Individual assignment:** Assign each student the task of explaining how to maintain drawing tools **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• inspections • Create maintenance schedule		**Theories:** The student should explain: • Importance of maintaining drawing tools **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions when maintaining various tools • Environmental issues • First aid.		
3. Performing Technical Drawings	3.1. Performing Technical Drawings	(a) Drawing paper formats and layout	**Brainstorming:** Guide the students to explain the meaning of paper format and layout **Practical:** Demonstrate to students on how to layout drawing paper **Activity:** Assign each	**The student should be able to:** • Read instructions • Interpret instruction • Prepare formats and title blocks • Perform freehand lettering • Mark point • Construct line drawings • Construct angles • Construct	Drawings paper layout prepared as per technical standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in in preparing drawing paper layout **Principles:** The student should explain the principles of: Drawing paper	The following tools, equipment, and safety gear are to be available: • Sheets of drawing paper of different sizes (A4, A3, A2, etc.) • Draughting table • Drawing boards • T -squares 30%/60% and 45% or adjustable set square • Drawing pen set • Pair of compasses • Ruler	780

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			student the task of drawing paper formats and layouts **Feedback:** Provide feedback to students on their tasks and introduce the next topic	triangles • Construct quadrilaterals • Construct polygons • Construct circles • Construct ellipses • Construct pictorial drawings • Construct orthographic projections		layout **Theories:** The student should explain: • Application of various geometrical lines • Plane and solid geometry • Application of various tools and equipment • Application of teaching aids in solid geometry **Circumstantial knowledge** **Detailed knowledge about:** • Safe handling of drawing tools • Safe operation of drawing equipment • Safe protection of machines by covering	• Erasing shield • Parallelogram • Protractor • Pencil sharpener • Clutch pencil/pencil	
		(b) Writing Freehand and mechanical lettering	**Brainstorming:** Guide the students to explain the concept lettering,	**The student should be able to:** • Read instructions • Interpret	Freehand and mechanical lettering performed as per instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The	The following tools, equipment, and safety gear are to be available: • Draughting table • Drawing boards	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			and identify types of lettering **Practical:** Demonstrate to students on how to perform lettering **Activity:** Guide each student to perform lettering as per Architectural standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	instruction • Identify different types of font styles suitable for drawing • Identify steps of performing lettering • Perform Freehand lettering • Perform mechanical lettering		student should explain the methods involved in: Writing Freehand and Mechanical Lettering **Principles:** The student should explain the principles of: • Performing lettering **Theories:** The student should explain: • Uses of lettering • Importance of lettering **Circumstantial knowledge** **Detailed knowledge about:** • Safe handling of drawing tools • Observing lettering standards	• T -squares • 30%/60% and 45% or adjustable set squares • Drawing pen set • Pair of compasses • Ruler • Erasing shield • Protractor • Pencil sharpener • Clutch pencil/pencil	
		(d) Constructing	**Brainstorming:**	**The student should**	Plane figure	**Knowledge**	The following tools,	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		plane geometry	Guide the students to explain the concept of plane geometry, and identify types of plane figures **Practical:** Demonstrate to students on how to construct plane figures **Activity:** Assign each student to construct plane Geometry as per Engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**be able to:** To perform plane geometry drawings in accordance with technical standards	constructed as per instruction	**evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in producing technical drawings **Principles:** The student should explain the principles of: • Arm movement while performing freehand lettering • Constructing basic and solid geometry • applying geometric drawing in real-world situations **Theories:** The student should explain application of: • Various geometrical lines • Plane and solid geometry	equipment, and safety gear are to be available: • Draughting table • Drawing boards • T -squares • 30%/60% and 45% or adjustable set squares • Drawing pen set • Pair of compasses • Ruler • Erasing shield • Protractor • Pencil sharpener • Clutch pencil/pencil	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Various tools and equipment • Teaching aids in solid geometry **Circumstantial knowledge** **Detailed knowledge about:** • Safe handling of drawing tools • Safe operation of drawing equipment • Safe protection of machines by covering		
		(e) Constructing solid geometry	**Brainstorming:** Guide the students to explain the concept of solid geometry (3D), and identify types of solid geometry **Practical:** Demonstrate to students on how to construct solid geometry	**The student should be able to:** • Select tools • Identify types of three-dimensional drawings • Identify the appropriate steps for creating three-dimensional drawings	Three-dimensional figures drawn as per standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in constructing solid geometry **Principles:** The student should explain the principles of: • Constructing solid geometry	The following tools, equipment, and safety gear are to be available: • Draughting table • Drawing boards • T -squares • 30%/60% and 45% or adjustable set squares • Drawing pen set • Pair of compasses • Ruler • Erasing shield • Parallelogram • Protractor	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Activity: Assign each student to construct solid geometry as per Engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			**Theories:** The student should explain: • meaning of three -dimensional drawings • types of three-dimensional drawings • Uses of three-dimensional drawings **Circumstantial knowledge** **Detailed knowledge about:** • Observation of standard of drawing three-dimensional drawings	• Pencil sharpener • Clutch pencil/pencil	
	3.2. Performing Scaling	(a) Applying Architectural scales	**Brainstorming:** Guide the students to explain the concept of scale and its use **Practical:** Demonstrate to students on how to apply scale in drawings	**The student should be able to:** • Select tools and materials • Layout a drawing paper • Choose the appropriate scale to be used for a drawing according to the paper and object size provided	Architectural scale applied as per standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in scaling of drawings/objects. **Principles:** The student should explain the	The following tools, equipment, and safety gear are to be available: • Draughting table • Drawing boards • T -squares • 30%/60% and 45% or adjustable set squares • Drawing pen set • Pair of compasses • Scale rule • Erasing shield	225

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Activity: Guide each student to apply scale in drawings	• Draw the given object on the paper		principles of: • Scaling of drawings/objects **Theories:** The student should explain: • Meaning of scaling • Identify application of scale relating to type of drawing **Circumstantial knowledge** **Detailed knowledge about:** Observation of standard of using specified scale ratio	• Protractor • Pencil sharpener • Clutch pencil/pencil • Scientific calculators	
		(b) Reducing and enlarging drawings	**Brainstorming:** Guide the students to explain the concept of enlarging and reducing objects by providing examples, such as how a house is scaled to fit on a paper when	**The student should be able to:** • Select methods of reduction/enlarge drawing • Select tools • Read drawing to be changed • Transfer the dimension to destination file.	Enlarged/reduced drawings produced conforming to technical specifications.	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in: Reducing and enlarging drawings **Principles:** The	The following tools, equipment, and safety gear are to be available: • Draughting table • Drawing boards • T -squares • 30%/60% and 45% or adjustable set squares • Drawing pen set • Pair of compasses • Ruler	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			drawing it. **Practical:** Demonstrate to students on how to enlarge and reduce object by use of scale **Activity:** Assign each student the task of enlarging and reducing a given drawing as per Architectural standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Carryout dimension • Clean and store drawing tools		student should explain principles of: • Enlargement and reduction of drawings **Theories:** The student should explain the importance of: • Reducing and enlarging drawings **Circumstantial knowledge** **Detailed knowledge about:** • Observation of standards • Handling of tools and equipment	• Erasing shield • Protractor • Pencil sharpener • Clutch pencil/pencil • Scientific calculators	

Form Two

Table 4*: Detailed Contents for Form Two*

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
1. Identifying Building Materials	1.1. Identifying Binding Materials	(a) Identifying binding materials	**Brainstorming:** Guide the students to explain the concept on building binding materials **Practical:** Demonstrate to students how to identifying binding materials **Activity:** Assign the students in manageable groups to identify binding materials as per building standards **Individual assignment:** Assign each student the task of identifying different binding materials**Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Explain the meaning of binding materials • Identify types of binding materials used in construction • Explain the functions of various binding materials	Correct application of binding materials conforming to building requirements, environmental factors, and set standards Written specification text conforms to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in manufacturing and application of binding materials as used in building construction **Principles:** The student should explain the: • Uses of binding materials • Function of binding materials **Theories:** The student should explain: • Application of binding materials	The following tools, equipment, and safety gear are to be available: • Charts • Handouts • Binding materials • Safety gear • Tools and materials for preparation of mortar such as sand, water, hoe spade, etc.	67

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Mixing process of binding materials **Circumstantial knowledge** **Detailed knowledge about:** • Observation of construction standards		
	1.2. Identifying Structural Building Materials	(a) Identifying stones	**Brainstorming:** Guide the students to describe various types of stones used in building **Question and answer:** Use questions and answers to guide the students to explore various types of stones and their properties **Activity:** Assign the students to walk around the school compound or visit construction and other sites; and collect different types of stones then group them	**The student should be able to:** • Explain the types of stones and their formation • Explain the application of stones in building construction	Application of stone materials conforms to building requirements, environmental factors, and set standards Written specification text conforms to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain different types of stones and their formation **Principles:** The student should explain the principle of: • Classifying stones **Theories:** The student should explain: • Application of stone in buildings,	The following tools, equipment, and safety gear are to be available: • Samples of different types of stones • Buildings and landscapes built in stones to be used as case studies • Safety gear • Handouts • Clutch pencil /pencil	67

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			according their properties **Feedback:** Provide feedback to students on their tasks and introduce the next topic			structures, and landscape works **Circumstantial knowledge** **Detailed knowledge about:** • Observation of construction standards		
		(b) Identifying concrete	**Brainstorming:** Guide the students to define concrete **Question and answer:** Use questions and answers to guide the students to explore production and components of concrete and their properties **Activity:** Guide the students to prepare concrete as per specified ratio	**The student should be able to:** • Explain the components of concrete and the production of concrete • Differentiate grades of aggregate • Explain the application of concrete in building construction • Explain the whole process of concrete mixing/ manufacturing	Correct application of concrete conforming to building requirements, environmental factors, and set standards Written specification text conforms to set standards.	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the process of concrete production and different methods used in concrete production **Principles:** The student should explain the: • Components of concrete • Grades of aggregates • Methods used	The following tools, equipment, and safety gear are to be available: • Concrete components: aggregate, cement, sand, water, etc. • Tools for mixing concrete: shovel, hoe, mixer, etc. • Sieves • Safety gear • Tools and equipment for checking concrete	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				• Explain the concrete curing process and its importance		in producing concrete • Properties of concrete **Theories:** The student should explain: • Application of concrete and aggregates in construction **Circumstantial knowledge** **Detailed knowledge about:** • Observation of quality of concrete and aggregates based on set standards	quality • Tools and materials for curing concrete • Drawing board • Clutch pencil/pencil	
		(c) Identifying bricks and blocks	**ICT-based learning:** Prepare a video on the making of bricks and blocks, guiding students to define bricks and blocks and learn how they are made	**The student should be able to:** • Explain bricks and blocks and the materials used in their production • Explain the application of	Bricks and blocks identified conforming to building requirements, environmental factors, and set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain bricks and blocks, and their	The following tools, equipment, and safety gear are to be available: • Samples of standard bricks and blocks • Brick and	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Field visit: Organise the students in groups or the whole class to visit a brick and block production sites to study how to make bricks and blocks **Group discussion:** Guide the students to present their findings from the videos and field works on how to make bricks and blocks and differentiate between bricks and blocks **Individual assignment:** Assign each student the task of identifying concrete as per engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	blocks in building construction • Differentiate bricks from blocks • Explain the process of bricks and blocks manufacturing		production **Principles:** The student should explain the: • Types and Uses of bricks and blocks • Standard sizes of bricks and blocks **Theories:** The student should explain: • Application of bricks and blocks in construction **Circumstantial knowledge** **Detailed knowledge about:** • Observation of quality and standards	block moulding tools • Materials for brick and block production: cement, sand, clay, water, etc. • Safety gear • Sieves • Spade • Hoe • Buildings built with bricks and blocks	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
		(d) Identifying timber	**ICT-based learning:** Prepare videos on timber building material and guide the students to learn about timber production, treatment, and defects **Field visit:** Organise the students in groups or the whole class to visit a nearby timber workshop or construction site to learn timber production, treatment, and defects **Group discussion:** Guide the students to present their findings on timber production, treatment, and defects from the videos and field works **Individual assignment:** Assign each student the task of identifying various types of timber	**The student should be able to:** • Explain timber structure • Differentiate hardwood and softwood • Differentiate uses of timber according to their types • Explain the process of timber production • Explain timber defects • Explain the methods of timber treatment and preservation	Correct application of timber conforming to building requirements, environmental factors and set standards Written specification text conforms to set standards.	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should classify timber **Principles:** The student should explain the: • Types of timber • Uses of timber • Treatment and preservation of timber **Theories:** The student should explain: • Types of timber • Uses of timber • Defects of timber **Circumstantial knowledge** **Detailed knowledge about:** • Observation of	The following tools, equipment, and safety gear are to be available: • Charts • Handouts • Timber • Buildings made with timber materials • Sample defective timber	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Feedback: Provide feedback to students on their tasks and introduce the next topic			standards		
		(e) Identifying metal materials	**ICT-based learning:** Prepare videos on metal building materials and guide the students to learn about metal properties and uses in building construction **Field visit:** Organise the students into groups or as a whole class to visit a nearby metal workshop, construction site, or building constructed with metal materials to observe and learn about the use of metals in building construction **Group discussion:** Guide the students to present their findings on metal properties and their uses from the videos and field works	**The student should be able to:** • Explain the meaning of metals • Explain types of metals and their properties • Explain uses of metals in construction • Differentiate metals from non-metals	Properties and uses of metal explained and differentiated	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain types of metals **Principles:** The student should explain principles involved in: • Identifying types metals **Theories:** The student should explain: - • Types of metals • Uses of metals **Circumstantial knowledge** **Detailed knowledge about:** • Observation of standards	The following tools, equipment, and safety gear are to be available: • Charts • Handouts • Metals • Buildings comprising metal materials • Safety gear	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Individual assignment: Assign each student the task of identifying metal materials **Feedback:** Provide feedback to students on their tasks and introduce the next topic					
	1.3. Identifying Glass and Plastic	(a) Identifying glass	**ICT-based learning:** Prepare videos on glass building materials and guide the students to learn about their properties and uses in building construction **Field visit:** Organise the students into groups or as a whole class to visit a nearby glass workshop, construction site, or building where glass has been significantly used to observe and learn about its applications in building construction **Group discussion:** Guide the students to	**The student should be able to:** • Explain glass and its production • Explain various types of glass materials • Explain glass uses according to their types	Correct application of glass conforming to building requirements, environmental factors, and set standards Written specification text conforms to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: classify glass. **Principles:** The student should explain the principles involved in: • Identifying glasses **Theories:** The student should explain: • Types glass • Uses of glass **Circumstantial knowledge**	The following tools, equipment, and safety gear are to be available: • Samples of glass • Buildings comprising glass material • Safety gear • Charts • Handouts • Drawing boards • T -square • Set squares • Clutch pencil /pencil	67

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			present their findings on glass properties and their uses from the videos and field works **Individual assignment:** Assign each student the task of identifying different types of glass **Feedback:** Provide feedback to students on their tasks and introduce the next topic			**Detailed knowledge about:** • Observation of standards		
		(b) Identifying plastic	**ICT-based learning:** Prepare videos on plastic building materials and guide the students in learning about their properties and applications in building construction **Field visit:** Organise the students in groups or as a whole class to visit a nearby plastic works workshop, construction site, or building where plastic has been	**The student should be able to:** • Explain plastic and its production • Explain various types of plastic • Explain uses of plastic according to their types	Correct application of plastic conforming to building requirements, environmental factors, and set standards Written specification text conforms to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The Student should explain how to: • Classify plastics **Principles:** The student should explain the principles related to: • Plastic production	The following tools, equipment, and safety gear are to be available: • Samples of plastic used in construction • Buildings comprising plastic materials • Charts • Handouts • Drawing board • T -square	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			significantly used, to observe and learn about its properties and applications in building construction **Group discussion:** Guide the students to present their findings on plastic properties and their uses from the videos and field works **Individual assignment:** Assign each student the task of identifying different types of plastics **Feedback:** Provide feedback to students on their tasks and introduce the next topic			**Theories:** The student should explain: • Types glass • Uses of glass **Circumstantial knowledge** **Detailed knowledge about:** • Observation of standards	• Set squares • Clutch pencil /pencil	
	1.4. Identifying Paints	(a) Identifying types and uses of paints	**Brainstorming:** Guide the students to define paints and state uses of paints in building construction	**The student should be able to:** • Explain types of paints • Explain the constituents of all paints	types and uses of paints identified as per building requirements, environmental factors, and set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain classification of paints	The following tools, equipment, and safety gear are to be available: • Charts • Handouts • Paints • Colour charts • Safety gear	68

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			ICT-based learning: Prepare videos on paints properties and uses in building construction **Activity:** Assign the students in a manageable group to identify uses of paints **Individual assignment:** Assign each student the task of identifying types of paints and their uses **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Explain application of paints • Explain procedure for painting • Explain defects of paints		**Principles:** The student should explain principles involved in: • The production of paints **Theories:** The student should explain: • Types paints • Application of paints **Circumstantial knowledge** **Detailed knowledge about:** • Observation of standards	• Buildings painted in different colours	
		(b) Identifying procedure for painting and paint defects	**Brainstorming:** Guide the students to identify procedures for painting **Question and answer:** Use questions and answers to guide the students to explain	**The student should be able to:** • Explain types of paints • Explain the constituents of all paints • Explain application of	Procedure for painting identified as per requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain procedures for identifying paints	The following tools, equipment, and safety gear are to be available: • Charts • Handout • Paints • Colour charts • Safety gear	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			constituents of paints **Activity:** Assign the students to identify defects of paints **Individual assignment:** Assign each student the task of describing the procedures for painting and identifying paint defects **Feedback:** Provide feedback to students on their tasks and introduce the next topic	paints • Explain defects of paints		**Principles:** The student should explain the: • Application of paint **Theories:** The student should explain: • Types of paints • Application of various paint **Circumstantial knowledge** **Detailed knowledge about:** • Observation of standards		
2. Producing Basic Building Drawings	2.1. Producing Architectural Drawings	(a) Drawing site layout plan	**Brainstorming:** Guide the students to explain the meaning of site layout plan **Practical:** Demonstrate to students on how to draw a site layout plan **Activity:** Assign the students to individually draw site	**The student should be able to:** • Select tools appropriate for the task • Draw paper layout with title block • Select appropriate scale and plan work • Draw site layout plan	Site layout plans drawn according to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in producing site layout plans. **Principles:** The student should explain the principles of:	The following tools, equipment, and safety gear are to be available: • Drawing board • Drafting table • T-square • Set squares • Scale rule • Circle template • Clutch pencil	465

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			layout plan as per Architectural standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Perform inking of the drawings • Perform lettering of the drawings • Clean drawing tools and store them		• Drawing site layout plans • Inking a drawing • Lettering on the drawing **Theories:** The student should explain: • Dimensioning of a site layout plan • Information shown on a site layout plan **Circumstantial knowledge** **Detailed knowledge about:** • Safe handling of working tools • Safe handling of drawing pens	• Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener Scientific calculators	
		(b) Drawing floor and foundation plans	**Brainstorming:** Guide the students to explain the meaning of floor and foundation plans	**The student should be able to:** • Select tools appropriate for the task • Draw paper	Floor and foundation plan drawn according to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student	The following tools, equipment, and safety gear are to be available: • Drawing board	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Practical: Demonstrate to students on how to draw floor and foundation plans **Activity:** Assign the students to individually to draw floor and foundation plans as per Architectural standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	layout with title block • Select appropriate scale and plan work • Draw floor and foundation plans • Perform inking of the drawings • Perform lettering of the drawings • Clean drawing tools and store them		should explain the methods involved in producing floor and foundation plans **Principles:** The student should explain the principles of: • Drawing floor and foundation plans **Theories:** The student should explain: • Importance of drawing floor and foundation plans • Kind of information shown on floor and foundation plans **Circumstantial knowledge** **Detailed knowledge about:** • Safe handling of working	• Drafting table • T -square. • Set squares • Scale rule • Circle template • Clutch pencil/pencil • Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						tools • Safe handling of drawing pens		
		(c) Drawing elevations	**Brainstorming:** Guide the students to explain the meaning of elevation **Practical:** Demonstrate to students on how to draw elevation **Activity:** Guide the students to individually draw elevation plans as per Architectural standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Select tools appropriate for the task • Draw paper layout with title block • Select appropriate scale and plan work • Draw building elevations • Perform inking of the drawings • Perform lettering of the drawings • Clean drawing tools and store them	Building elevations drawn conform to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in producing building elevations **Principles:** The student should explain the principles of: • Drawing building elevations • Inking drawings • Lettering of drawings **Theories:** The student should explain: • Information shown on building elevations.	The following tools, equipment, and safety gear are to be available: • Drawing board • Drafting table • T -square • Set squares • Scale rule • Circle template • Clutch pencil/pencil • Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						Circumstantial knowledge **Detailed knowledge about:** • Safe handling of working tools • Safe handling of drawing pens		
		(d) Drawing roof plans	**Brainstorming:** Guide the students to explain the meaning of roof plan **Practical:** Demonstrate to students on how to draw roof plan **Activity:** Guide the students to individually draw roof plan as per Architectural standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Select tools appropriate for the task • Draw paper layout with title block • Select appropriate scale and plan work • Draw roof plans • Perform inking of the drawings • Perform lettering of the drawings • Clean drawing tools and store them	Drawn roof plans conform to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in producing roof plans **Principles:** The student should explain the principles of: • Drawing roof plans • Inking drawings • Lettering of the drawings **Theories:** The student should explain:	The following tools, equipment, and safety gear are to be available: • Drawing board • Drafting table • T -square • Set squares • Scale rule • Circle template • Clutch pencil/pencil • Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Dimensioning of roof plans • Information shown on roof plans **Circumstantial knowledge** **Detailed knowledge about:** • Safe handling of working tools • Safe handling of drawing pens • Neatness of the drawings		
		(e) Drawing sections	**Brainstorming:** Guide the students to explain the meaning of sections **Practical:** Demonstrate to students on how to draw sections **Activity:** Assign the students individually to draw sections as per	**The student should be able to:** • Select tools appropriate for the task • Draw paper layout with title block • Select appropriate scale and plan work • Draw building sections.	Drawn building sections conform to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in producing building sections **Principles:** The student should explain the principles of:	The following tools, equipment, and safety gear are to be available: • Drawing board • Drafting table • T -square • Set squares • Scale rule • Circle template • Clutch pencil/pencil	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Architectural standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Perform inking of the drawings • Perform lettering of the drawings • Clean drawing tools and store them		• Drawing building sections • Inking drawings • Lettering of the drawings **Theories:** The student should explain: • Dimensioning of building sections • Information shown on building sections **Circumstantial knowledge** **Detailed knowledge about:** • Safe handling of working tools • Safe handling of drawing pens • Protection from dust during tracing	• Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Neatness of the drawings		
		(f) Drawing three-dimensional drawings	**Brainstorming:** Guide the students to explain the meaning of three-dimensional drawings **Practical:** Demonstrate to students on how to draw three-dimensional drawings **Activity:** Assign the students individually draw to three-dimensional drawings as per Architectural standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Select tools appropriate for the task • Draw paper layout with title block • Select appropriate scale and plan work • Draw three-dimensional drawings • Perform lettering of the drawings • Clean drawing tools and store them.	Drawn three-dimensional drawings conform to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in producing three-dimensional drawings **Principles:** The student should explain the principles of: • Drawing three-dimensional drawing • Lettering of the drawings. **Theories:** The student should explain: • Types of three-dimensional drawings • Information shown on three-dimensional	The following tools, equipment, and safety gear are to be available: • Drawing board • Drafting table • T -square • Set squares • Scale rule • Circle template • Clutch pencil/pencil • Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						drawings **Circumstantial knowledge** **Detailed knowledge about:** • Safe handling of working tools • Safe handling of drawing pens • Protection from dust during tracing • Neatness of the drawings		
	2.2. Writing Specifications	(a) Writing a schedule of materials and symbols	**Brainstorming:** Guide the students to explain the meaning of schedule of materials and symbols **Practical:** Demonstrate to students on how to write schedule of materials and symbols **Activity:** Assign the students in group on how to write schedule of materials	**The student should be able to:** • Select tools as per range statement • Prepare paper format and title block layout • Draw floor plan, drawings, section, and elevations • Write dimensions • Write/express	Written schedule of material conforms to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in the writing of schedule of materials **Principles:** The student should explain the principle of:	The following tools, equipment, and safety gear are to be available: • Drawing board • T -square • Set squares • Clutch pencil /pencil • Drawing pens • Erasing shield • Lettering stencils • Scientific	225

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			and symbols and supervise them while performing the activity **Feedback:** Provide feedback to students on their tasks and introduce the next topic	correct material symbols on floor plan and section drawings		• Labelling a drawing • Rendering a drawing **Theories:** The student should identify: • Labelling techniques **Circumstantial knowledge** **Detailed knowledge about:** • Handling of tools • Storage of drawings (transparencies)	calculators	
		(b) Writing a schedule of specifications	**Brainstorming:** Guide the students to explain the meaning of schedule of specifications **Practical:** Demonstrate to students on how to write schedule of specifications	**The student should be able to:** • Select tools as per range statement • Prepare paper format and title block layout • Draw floor plan, drawings, section, and elevations • Write	Written schedule of specification conforms to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in the writing of schedule of specifications **Principles:** The student should explain the	The following tools, equipment, and safety gear are to be available: • Drawing board • T -square • Set squares • Clutch pencil /pencil • Drawing pens • Erasing shield • Lettering	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Activity: Assign the students to groups to write a schedule of specifications and supervise them while performing the activity **Feedback:** Provide feedback to students on their tasks and introduce the next topic	dimensions • Write/express correct material symbols on section drawings • Write specifications on floor plan and section drawings		principles involved in: • Writing schedule of specifications **Theories:** The student should explain: • Importance of writing schedule of specifications **Circumstantial knowledge** **Detailed knowledge about:** • Handling of tools • Storage of drawings (transparencies)	stencils • Scientific calculators	
3. Adapting Building Construction Technologies	3.1. Adapting Building Construction Techniques	(a) Adapting foundation construction techniques	**ICT-based learning:** Guide the students through the use of multimedia and simulation to visualise and explore different foundation construction techniques **Group discussion**: Organise the students in small groups to list	**The student should be able to:** • Identify various types of foundations • Describe function of foundation in a building • Explain factors to consider in	Foundation construction techniques applied as per standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain different foundation construction techniques and methods	The following tools, equipment, and safety gear are to be available: • Working Drawings • Audio visual facilities	56

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			and describe different foundation construction techniques **Activity:** Guide students in groups to distinguish between various foundation construction techniques **Feedback:** Provide feedback to students on their tasks and introduce the next topic	foundation design		**Principles:** The student should explain the principle involved in: • Foundation construction techniques **Theories:** The student should explain: • Importance of foundation • Functions of foundation **Circumstantial knowledge** **Detailed knowledge about:** • Safety procedures in foundation construction • Environmental issues in foundation construction		
		(b) Adapting floors construction techniques	**ICT-based learning:** Guide the students through the use of multimedia and simulation to visualise and explore different	**The student should be able to:** • Explain site preparations needed for floor	Applied floor construction techniques conform to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student	The following tools, equipment, and safety gear are to be available: • Laptop/compu	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			floor construction techniques **Group discussion**: Organise the students in small groups to list and describe different floor construction techniques **Individual assignment** Assign each student the task of distinguishing between different floor construction techniques. **Feedback:** Provide feedback to students on their tasks and introduce the next topic	construction • Describe tools for floor construction • Select working drawings • Describe ground floor slab construction • Describe construction techniques of upper floors slabs for a multi-storey building		should explain techniques and methods involved in constructing floors **Principles:** The student should explain the principles involved in: • Floors construction **Theories:** The student should explain: • Materials used in building floors construction • Different types of floors • Floors construction techniques **Circumstantial knowledge Detailed knowledge about:** • Safety procedures in building floors	ter • Projector • Working drawings • Buildings with different types of floors for study visits	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						construction • Environmental issues in building floors construction		
		(c) Adapting wall construction techniques	**ICT-based learning:** Guide the students through the use of multimedia and simulation to visualise and explore different wall types and construction techniques **Group discussion**: Organise the students in small groups to list and describe different wall construction techniques **Individual assignment** Assign each student the task of differentiating between various wall construction techniques **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Describe how to prepare site for wall construction • Describe tools used in wall construction • Select working drawings • Describe how to set out building walls on the floor or slab • Describe how to lay superstructure walls • Describe methods of bridging openings on walls • Describe wall finishing techniques	walls constructed as per required standards	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain techniques and methods involved in constructing walls **Principles:** The student should explain the principle of • Setting out building walls • Constructing building walls • Opening bridging • Arches construction • Wall finishing	The following tools, equipment, and safety gear are to be available: • Laptop/computer • Projector • Working drawings • Buildings with different types of floors for study visits	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						Theories: The student should explain: • Materials used in building walls construction • Types of walls • Wall construction techniques • Different types of arches in opening • Different types masonry • Handling of tools • Storage of tools • Environmental issues related to superstructure walls construction		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						Circumstantial knowledge Detailed knowledge about: • Handling of tools • Storage of tools • Observation of standards • Environmental issues related to superstructure walls construction		
		(d) Adapting ceiling construction techniques	**ICT-based learning:** Guide the students through the use of multimedia and simulation to visualise and explore different ceiling types and ceiling construction techniques **Group discussion**: Organise the students in small groups to list and describe different ceiling construction techniques	**The student should be able to:** • Describe how to prepare the building for ceiling installation • Explain tools involved in ceiling installation • Select working drawings • Describe how to fix ceiling supporting	Ceiling installed as per the required standards	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain techniques and methods involved in installing ceilings **Principles:** The student should explain the principle of: • Planning and measuring the	The following tools, equipment, and safety gear are to be available: • Laptop/computer • Projector • Working drawings • Buildings with different types of ceilings within the school compound	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Individual assignment Assign each student the task of differentiating between various ceiling construction techniques **Feedback:** Provide feedback to students on their tasks and introduce the next topic	members • Describe how to install the ceiling • Describe cleaning and storage of tools		ceiling dimensions • Fixing the support frame for the ceiling • Installing the ceiling • Applying ceiling finishes **Theories:** The student should explain: • Types of ceilings • Materials used in ceiling construction • Fixing of different types of ceilings • Application of different types of ceilings finishes • Ceiling construction techniques • Handling of		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						tools • Storage of tools • Environmental issues **Circumstantial knowledge** **Detailed knowledge about:** • Safety procedures when installing a ceiling • Observation of standards • Environmental issues related to ceilings construction and finishes		
		(e) Adapting stairs construction techniques and details	**ICT-based learning:** Guide the students through the use of multimedia and simulation to visualise and explore different stair types and stair construction techniques	**The student should be able to:** • Explain parts of stairs • Explain various types of stairs • Describe tools used in the construction of stairs	Stairs built as per required standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain techniques and methods involved in constructing stairs	The following tools, equipment, and safety gear are to be available: • Laptop computer • Projector • Working drawings • Buildings	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Group discussion: Organise the students in small groups to list and describe different stair construction techniques **Individual assignment** Assign each student the task of differentiating various stair construction techniques **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Describe how to set out a stair • Describe the construction of stairs • Describe cleaning and storage of tools		**Principles:** The student should explain the principles of • Setting out a stair • Constructing a stair • Application of finishes to stairs **Theories:** The student should explain: • Types of stairs • Materials used in stairs construction • Uses of different types of stairs • Stair construction techniques • Storage of tools • Environmental issues.	with different types of stairs within the school compound	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						Circumstantial knowledge Detailed knowledge about: • Safety in stair construction • Environmental issues		
	3.2. Preparing Openings Assembly Details	(a) Preparing door assembly details	**Brainstorming:** Guide the students to identify parts of a door, different types of doors, and different modes of operation of doors in buildings **Practical:** Demonstrate to students on how to prepare assembling details of doors **Individual activity:** Guide each student in preparing assembly details of doors and drawing the details of the given doors according to standards **Feedback:** Provide feedback to students on their tasks	**The student should be able to:** • Describe doors • Explain types of doors • Describe the parts of a door • Explain different modes of operation of doors • Draw conventional symbols of standard doors • Draw door plans, elevations, and sections • Describe standard dimensions of doors • Lettering of detailed door	Door assembly details are prepared to the required standards	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain procedures involved in preparing door assembly details. **Principles:** The student should explain the principle of: • Assembling a door • Detailing door assembly **Theories:** The student should explain:	The following tools, equipment, and safety gear are to be available: • Drawing board • Drafting table • T -square • Set squares • Scale rule • Circle template • Clutch pencil/pencil • Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	56

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			and introduce the next topic	drawings • Label doors on building plans		• Materials used in fabricating doors • Types of doors • Modes of operation of different types of doors • Door construction techniques • Handling of tools • Storage of tools • Environmental issues **Circumstantial knowledge** **Detailed knowledge about:** • Handling of tools • Observation of standards • Storage of tools • Environment		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						al issues		
		(b) Preparing window assembly details	**Brainstorming:** Guide the students to identify parts of a door, different types of windows, and different modes of operation of windows in buildings **Practical** Demonstrate to students on how to prepare assembling details of windows **Individual activity:** Guide the students in preparing to draw details of given windows **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Describe windows • Explain various types of windows • Describe the parts of a window • Explain different modes of operation of windows • Draw conventional symbols of standard windows • Draw window plans, elevations, and sections • Describe standard dimensions of windows • Lettering of detailed windows drawings • Label windows on building plans	Window assembly details are prepared to the required standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain procedures involved in preparing window assembly details **Principles:** The student should explain the principle of • Assembling a window • Detailing window assembly **Theories:** The student should explain: • Materials used in fabricating windows • Types of windows • Modes of operation of	The following tools, equipment, and safety gear are to be available: • Drawing board • Drafting table • T -square • Set squares • Scale rule • Circle template • Clutch pencil/pencil • Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						different types of windows • Window construction techniques • Handling of tools • Storage of tools • Environmental issues **Circumstantial knowledge** **Detailed knowledge about:** • Handling of tools • Observation of standards • Storage of tools • Environmental issues		
	3.3. Installing Building Services	(a) Installing plumbing systems	**Brainstorming:** Guide the students to describe plumbing systems in a building **Practical** Demonstrate to	**The student should be able to:** • Select tools • Draw conventional symbols for plumbing system	Plumbing system layout is drawn to the required standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain	The following tools, equipment, and safety gear are to be available: • Plumbing pipes • Plumbing	57

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			students on how to do plumbing systems work **Individual activity:** Guide the students in preparing plumbing system layout as per Engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Draw plumbing installation layout plan for a building • Draw plumbing system on a building elevation/section • Write water supply layout general notes • Draw plans and sections of septic tank and soak-away pit		techniques and methods involved in installing plumbing systems **Principles:** The student should explain the principle of • Installation of plumbing systems • Drawing plumbing systems **Theories:** The student should explain: • Materials used in plumbing system installation construction • Pipe sizes • Types of plumbing systems • Working of a clean water supply system • Main parts of a plumbing	fixtures • Building plumbing systems • Floor plan and sections • Drawing board • Drafting table • T -square • Set squares • Scale rule • Circle template • Clutch pencil/pencil • Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						system • Procedures for drawing plumbing system in a building • Drainage system • Types of drainage systems • Handling of tools • Storage of tools • Environmental issues **Circumstantial knowledge** **Detailed knowledge about:** • Handling of tools • Observing standards • Storage of tools • Environmental issues		
		(b) Installing electrical systems	**Brainstorming:** Guide the students to describe electrical	**The student should be able to:** • Draw	Plumbing system layout is drawn to the required	**Knowledge evidence: Detailed**	The following tools, equipment, and safety gear are	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			systems in a building **Practical** Demonstrate to students how to perform electrical system operations **Individual activity:** Guide the students in preparing electrical system layout as per Engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	conventional electrical symbols • Draw electrical installation layout plan for a building • Draw electrical installation details on a building section/elevation	standards	**knowledge of:** **Method used:** The student should explain techniques and methods involved in installing electrical systems. **Principles:** The student should explain the principle of • Installation of electrical systems • Drawing electrical installation systems **Theories:** The student should explain: • Materials used in electrical system installation construction • Working of an electrical installation system • Main parts of an electrical	to be available: • Electrical installation wires • Electrical installation components • Building electrical installations • Floor plan and sections • Drawing board • Drafting table • T -square • Set squares • Scale -ruler • Circle template • Clutch pencil/pencil • Drawing pens • Lettering stencils • Parallelogram • Pencil sharpener • Scientific calculators	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						installation system • Procedures for drawing electrical system in a building • Handling of tools • Storage of tools • Environmental issues **Circumstantial knowledge** **Detailed knowledge about:** • Handling of tools • Observing standards • Storage of tools • Environmental issues		
4. Performing Physical Building Measurements	4.1. Carrying out Physical Building Measurement	(a) Carrying out physical building measurement	**Brainstorming:** Guide the students to explain the physical building measurements **Practical** Demonstrate to	**The student should be able to:** • Select tools • Set out reference point • Survey and sketch building	A Freehand drawn set of outline drawings that conform to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain	The following tools, equipment, and safety gear are to be available: • Clipboard • Measuring tapes	75

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			students on how to carry out physical building measurement **Activity:** Guide the students in manageable groups to take measurements of a selected simple building within the school compound **Feedback:** Provide feedback to students on their tasks and introduce the next topic	layout • Take measurements of the building on floor plan • Sketch the elevations and sections • Take measurements of building parts on elevations and sections • Sketch detailed drawings of selected parts • Measure levels using horse pipe • Sketch 3D drawings of the building • Store the tools		different ways of: • Performing Freehand sketching • Conducting measurements **Principles:** The student should explain the principles of: • Triangulation used in measurement • Measurement by using a horse water pipe **Theories:** The student should explain: • The importance of physical measurements • Forms of measured drawings • Stages in conducting measured	• Water hose pipe • Straight timber board • Clear safety glasses • Masks • Helmets • Gloves • Pair of compasses • Ranging poles • Dumpy level • Machete (Panga) • Scientific calculators • Steel arrows • Hammer	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						works • Types of surveys • Principal adjustment methods • Data collection • Presentation of technical data **Circumstantial knowledge** **Detailed knowledge about:** • Safety requirements • Accurate measurement		
	4.2. Preparing Measured Drawings and Documentation	(a) Preparing documentation of measured work	**Brainstorming:** Guide the students to explain the meaning of documentation of physical building measurements **Practical** Demonstrate to students on how to document physical building measurement	**The student should be able to:** • Review information obtained from site • Organise information obtained from site • Write general information of the measured	Well organised and documented set of measured drawings from site conforming to required standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain methods involved in the: • Taking measurements of buildings on site	The following tools, equipment, and safety gear are to be available: • Drawing board • T-square • Set squares • Scale rule • Clutch pencil/pencil • Lettering stencils	45

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Activity: Guide each student to document physical building measurements of the measured selected simple building within the school compound **Feedback:** Provide feedback to students on their tasks and introduce the next topic	building • Verify and add annotations on the drawings where necessary		• Preparation of measured drawings documentation **Principles:** The student should explain the principles involved in: • Taking measurements • Documentation writing **Theories: The** student should explain: • Types of measured drawings • Dimensioning techniques • Interpretation of drawings Circumstantial knowledge Detailed knowledge about: • Safety requirements • Accuracy	• Drawing pens • Pencil sharpener • Clipboard	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Site and environmental issues		
		(b) Preparing as-built drawings	**Brainstorming:** Guide the students to describe as built drawings **Activity:** Guide each student to as per built drawing of the measured selected simple building within the school compound **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Collect original design of the building • Select tools • Calculate the dimensions • Decide the scale to be used • Prepare drawing paper format and layout • Draw the site layout plan • Draw floor plans as per dimensions • Draw the elevations • Draw building sections • Prepare detailed drawings for selected elements • Ink the drawings	Traced drawings with all dimensions drawn conform to required standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain methods involved in the: • Production of measured drawings (“as built” drawing) • Preparation of documentation Principles: The student should explain the principles involved in: • Production of as-built drawings Theories: The student should explain: • Types of measured drawings • Scale and	The following tools, equipment, and safety gear are to be available: • Drawing board • T-square • Set squares • Scale rule • Clutch pencil/pencil • Lettering stencils • Drawing pens • Pencil sharpener • Clipboard.	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						determination • Dimensioning techniques • Inking techniques • Interpretation of drawings • Types of storage drawings **Circumstantial knowledge** **Detailed knowledge about:** • Neatness of the drawings • Accuracy		
		(c) Archiving as-built drawings	**Brainstorming:** Guide the students to explain the meaning of drawing archival **Practical** Demonstrate to students on how to archive drawings **Activity:** Guide students on how to archive as-built drawings according to	**The student should be able to:** • Select method of storage • Select tools for storage • Organise drawings • Store drawings • Secure drawings	Safely and properly archived as-built drawings	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain methods involved in the: • Archiving of "as built" drawings **Principles:** The student should	The following tools, equipment, and safety gear are to be available: • Drawing board • T-square • Set squares • Scale rule • Clutch pencil/pencil • Lettering stencils • Drawing pens	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			drawing standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			explain the principles involved in: • Documenting archives of as-built drawings • Organising as-built drawings • Ensuring security of as-built drawings **Theories:** The student should explain: • Types of storage drawings **Circumstantial knowledge Detailed knowledge about:** • Safety and security requirements	• Pencil sharpener • Clipboard	

Form Three

Table 5: *Detailed Contents for Form Three*

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
1. Producing Working Drawings by Using CAD Software	1.1. Applying Computer Aided Design in Producing working Drawings	(a) Connecting computer peripherals	**Question and answer:** Use questions and answers to guide the students to explain the meaning of computer peripherals and their use **Demonstration:** Demonstrate to students on how to connect computer peripherals **Activity:** Guide each student to connect computer peripherals by following appropriate procedures **Feedback:**	**The student should be able to:** • Prepare your working desk • Turn the computer off (if it is desktop computer) • Select the peripherals to be connected (USB, HDMI, VGA etc.) • Connect the peripherals • Turn on the computer • Install necessary drivers for peripherals that do not install drivers automatically • Test and troubleshoot peripherals	Peripherals connected and working properly	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to connect computer peripherals. **Principles:** The student should explain the general principles on how to connect computer peripherals **Theories:** The student should explain: • Types of computer peripherals • Application of different types of peripherals • Troubleshooting peripherals **Circumstantial knowledge** **Detailed**	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	166

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			Provide feedback to students on their tasks and introduce the next topic			**knowledge about:** Personal and computer safety requirements		
		(b) Installing and running CAD program	**Question and answer:** Use questions and answers to guide the students in describing CAD software and its uses **Demonstration:** Demonstrate to students how to install CAD software and draw objects using it **Activity:** Guide each student in installing CAD software and drawing objects with it **Feedback:** Provide	**The student should be able to:** • Installing CAD • Activate CAD • Update the CAD program if desired • Identify different commands and their uses • Draw different shape and figures	Different objects are drawn by using CAD software	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to install AutoCAD software create, save and manage files **Principles:** The student should explain the general principles on how to install, uninstall, create files, save files and manage **Theories:** The student should explain: • Use of CAD commands • Use of CAD in civil draughting **Circumstantial**	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			feedback to students on their tasks and introduce the next topic, along with the reference on the hand out			**knowledge** **Detailed knowledge about:** Personal and computer safety requirements	• Flash disc 4 GB or above	
	1.2. Producing Architectural Drawings	(a) Drawing the ground floor and general floor drawings	**Question and answer:** Use Questions and answers to guide the students to explain the meaning of floor plan **Activity:** Guide each student to draw the floor plan by using CAD softwareas per Engineering standards **Feedback:** Provide feedback to students on	**The student should be able to:** • Comprehend the task through reading • Compute measurements based on the sketch design • Run CAD software • Prepare the working space in the CAD window • Construct grid lines/centre-to-centre lines • Draw wall elements • Indicate openings • Specify floor finishing materials (conventional) • Apply all dimensions (detailed, centre-to-centre, and overall	The floor plan drawing and general floor plans well prepared as per architectural standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in: • Producing ground and general floor plan **Principles:** The student should explain the principles of: • Producing floor plans **Theories:** The student should explain: • The use of different CAD commands • The procedure of preparing	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least	166

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			their tasks and introduce the next topic	dimensions) • Define the function of each room • Save the drawing • Shut down the computer		floor plan • Information show in the floor plan **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	500W Printing paper • Flash disc 4 GB or above.	
		(b) Drawing Section drawings	**Question and answer:** Use questions and answers to guide the students to explain the meaning of section drawing **Activity:** Guide each student to draw section drawing by using CAD	**The student should be able to:** • Read floor plan intensively to task • Prepare drawing working space • Construct grid reference/centre to centre lines • Indicate wall regarding cutting line from floor plan • Indicate substructure elements • Indicate superstructure	Section drawing is well-prepared to conform to architectural standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in: • Producing section drawing **Principles:** The student should explain the principles of: • Producing section drawing **Theories:** The	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			software as per Engineering standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	elements • Indicate roof elements • Perform lettering to section drawing • Save the drawing and shut down the computer		student should explain: • The use of different CAD commands • The procedure of preparing section • Information show in the section drawing **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W. • Printing paper • Flash disc 4 GB or above	
		(c) Drawing elevation drawings	**Question and answer:** Use questions and answers to guide the students to explain the meaning of elevation	**The student should be able to:** • Read and comprehend the floor plan and section drawing for the task • Prepare the working space in the CAD window	Elevations drawings prepared to conform to architectural standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in: • Producing elevations	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			Activity: Guide each student to draw elevations by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Set the plinth line • Position windows at the bottom • Align the opening line with the section in terms of height • Indicate the roof view in reference to the floor plan and section • Add the location name for each elevation • Save the drawing and shut down the computer		**Principles:** The student should explain the principles of: • Producing elevations **Theories:** The student should explain: • The use of different CAD commands • The procedure of preparing elevations • Information show in the elevation **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	• Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
		(d) Drawing roof plan drawings	**Question and answer:** Use questions and answers to guide the students to explain the meaning of a roof plan **Activity:** Guide each student to draw roof plans by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Read and comprehend the task • Prepare the working space in the CAD window • Open the floor plan • Decide on the roofing style to be used (e.g., hipped roof) • Construct a 45-degree line at every corner of the floor plan • Connect the roof peaks where the 45-degree lines meet • Connect the lower parts of the lines to complete the roof plan • Save the drawing and shut down	The roof plan drawings are well prepared to conform to architectural standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in: • Producing a roof plan **Principles:** The student should explain the principles of: • Producing roof plans **Theories:** The student should explain: • The use of different CAD commands • The procedure of preparing roof plans • Information shows in the roof plan **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
						• Printing of drawings • Storage of drawings (both digital and physical storage)		
		(e) Drawing site layout drawings	**Question and answer:** Use questions and answers to guide the students to explain the meaning site layout drawings **Activity:** Guide each student to prepare site layout **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Read the given block plan to comprehend the task • Prepare working space in CAD window • Indicate main gate • Locate building position. • Indicate drainage system • Indicate gardens and trees area • Indicate north direction • Indicate plot coverage. • Perform letterings • Save the work and shutdown the computer	The site plan drawings are well-prepared to conform to architectural standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in: • Producing site plan **Principles:** The student should explain the principles of: • Producing site plans **Theories:** The student should explain: • The use of different CAD commands • The procedure of preparing site plan • Information shown in the	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example AutoCAD 2007 – or above versions) • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
						site plan **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	• Printing paper • Flash disc 4 GB or above	
	1.3. Preparing Services Drawings and Layouts	(a) Preparing Mechanical services drawings	**Brainstorming** Guide the students to explain the meaning of mechanical services drawings **Demonstration**: Demonstrate to students on how to prepare mechanical services drawings **Activity:**	**The student should be able to:** • Review architectural plans to identify mechanical needs • Determine heating, cooling, and ventilation requirements based on building usage and standards • Set up workspace • Take the labelled architectural plans (e.g., bathrooms) • Draw supply and return air ducts, exhaust ducts, and fresh air intake	Mechanical services drawings are well-prepared as per specified standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in preparing mechanical services drawings **Principles:** The student should explain the principles of: • Preparing mechanical services drawings **Theories:** The	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with	166

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			Guide the students in preparing mechanical services drawings **Feedback:** Provide feedback to students on their tasks and introduce the next topic	paths • Mark terminal points such as grilles, diffusers, and registers • Show locations for air handling units (AHUs), fan coil units (FCUs), exhaust fans, and chillers • Show ventilation paths for exhaust and fresh air systems • Indicate airflow direction using arrows and add flow rates where necessary • Ensure compliance with standards for air changes per hour (ACH) in specific rooms • Label ducts and pipes with sizes, materials, and insulation requirements • Add symbols for mechanical components (e.g., fans, dampers,		student should explain: • The use of different CAD commands • The procedure of preparing mechanical services drawings • Information shown in the mechanical services drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer. • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
				valves, etc.). • Specify equipment details, such as capacities and performance data • Add legends and schedules for ducts, pipes, and equipment • Save the drawing and shut down the computer				
		(b) Preparing electrical drawings	**Brainstorming** Guide the students to explain the meaning of electrical services drawings **Demonstration**: Demonstrate to students on how to prepare electrical services drawings **Activity:** Guide each student to	**The student should be able to:** • Review architectural plans to identify electrical needs (e.g. lighting, sockets, and appliances) Set up workspace • Take the labelled architectural plans • Mark light fixture positions on ceilings or walls • Indicate socket outlets, switches, and equipment requiring power • Show the location of the main distribution board	Electrical services drawings are prepared as per specified standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in preparing electrical services drawings **Principles:** The student should explain the principles of: • Preparing electrical services drawings **Theories:** The student should explain: • The use of	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above. • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU)	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			prepare electrical services drawings **Feedback:** Provide feedback to students on their tasks and introduce the next topic	(DB), sub-panels, and cable routes. • Draw wiring routes for lighting and power circuits • Use different line types for single-phase, three-phase, or data cables • Label circuits (e.g. "Circuit 1 – Lighting," "Circuit 2 – Sockets") • Include cable sizes, conduit types, and breaker ratings • Overlay electrical drawings with other services to check for conflicts • Add labels, dimensions, and a legend for symbols • Save the drawing and shut down the computer		different CAD commands • The procedure of preparing electrical services drawings • Information shown in the electrical services drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	
		(c) Preparing plumbing drawings	**Brainstorming** Guide the students to explain the meaning of plumbing services	**The student should be able to:** • Review architectural plans and identify plumbing requirements • Set up workspace	Plumbing services drawings are well-prepared as per specified standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			drawings **Demonstration**: Demonstrate to students on how to prepare plumbing services drawings **Activity:** Guide each student in preparing plumbing services drawings **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Take the labelled plans • Mark locations for water supply points (e.g. faucets, showers) and drainage fixtures (e.g. sinks, toilets) • Draw water supply lines and drainage pipes, using symbols for fixtures • Indicate pipe sizes and materials • Add slopes for drainage pipes • Check for conflicts with other services • Add labels, dimensions, and a legend for symbols • Save the drawing and shut down the computer		preparing plumbing services drawings Principles**:** The student should explain the principles of: • Preparing plumbing services drawings **Theories:** The student should explain: • The use of different CAD commands • The procedure of preparing plumbing services drawings • Information shown in the plumbing services drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings	RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
						• Storage of drawings (both digital and physical storage)		
	1.4. Making models	(a) Making building models	**Question and answer:** Use questions and answers to guide the students to describe building models and their uses **Activity:** Guide the students in manageable groups to make simple building models **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Decide on the model's purpose and select a scale • Select materials • Draw the building footprint on a sturdy base material • Mark key elements like walls, doors, and windows • Cut wall pieces to scale from foam board or cardboard • Cut out spaces for windows and doors in the wall pieces • Insert clear plastic sheets or leave openings as needed • Assemble and glue walls onto the base • Cut out and assemble roof pieces using angled cardboard or foam board • Attach securely to the walls	Building models are made as per specified standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in making building models **Principles:** The student should explain the principles of: • Making models **Theories:** The student should explain: • The use of models • The procedure of making models **Circumstantial knowledge** **Detailed knowledge about:** • Safety when using cutting tools	The following tools, equipment, and safety gear are to be available: • Foam board • Cardboard • Wood • Cardstock • Precision knife • Scissors • Ruler • Cutting mat • Glue • Tape	282

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
				• Use coloured paper, markers, or paint for textures and finishes • Add simple trees, shrubs, or figures for context if desired.		• Proper handling of materials		
		(b) Making building landscaping model	**Question and answer:** Use questions and answers to guide the students to describe landscaping model and their use **Activity:** Guide the students in manageable groups to make simple landscaping models **Feedback:** Provide feedback to students on their tasks and introduce the	• Identify the purpose of the model and choose a suitable scale • Select materials • Mark the layout of the landscape on the baseboard • Use contour lines if the design includes varying elevations • Build terrain by layering foam sheets or cardboard for elevations • Mark and construct paths, patios, or retaining walls using materials like thin cardboard, sandpaper, or small stones • For water bodies, use blue plastic sheets, resin, or paint	Landscaping model is made as per specified standards	**Knowledge evidence: Detailed knowledge of: Method used:** The Student should explain the methods involved in: Making landscaping models **Principles:** The student should explain the principles of: Making models **Theories:** The student should explain: • The use of models • The procedure of making models **Circumstantial knowledge Detailed**	The following tools, equipment, and safety gear are to be available: • Foam board, cardboard, or plywood • Foam sheets • Modelling clay • Cardboard • Moss • Green sponge • Model trees • Sand • Gravel • Small stones • Coloured paper • Precision knife • Scissors • Cutting mat • Ruler • Glue • Tape	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			next topic	• Represent grass with green felt, moss, or painted sand • Fix model trees • Scatter small pebbles or artificial turf for texture • Add benches, fences, pergolas, or structures • Include cars, people, or animals if desired		**knowledge about:** • Safety when using cutting tools • Proper handling of materials		
2. Preparing Structural Detailed Drawings	2.1 Preparing Building Structural Detailed Drawings	(a) Drawing foundation plan	**Question and answer:** Use questions and answers to guide the students to explain detailed structural drawings and foundation plan **Demonstration:** Demonstrate to students on how to draw detailed foundation	**The student should be able to:** • Read the floor plan • Prepare the working space • Create centre lines/grid reference lines • Indicate foundation walls • Indicate foundation base/footings • Indicate the cutting plane for foundation details • Indicate/add dimensions • Save the drawing and shut down the computer	Foundation plan is prepared as per structural specifications	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods of preparing foundation plan **Principles:** The student should explain the principles involved in: • Preparing foundation plan **Theories:** The student should explain: • Information	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with	225

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			drawings by using CAD software **Activity:** Guide each student to prepare foundation plan **Feedback:** Provide feedback to students on their tasks and introduce the next topic			shown on foundation drawings • Use of foundation drawings • Formulating detail drawings • Technical requirements of structural drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	
		(b) Drawing footings details	**Question and answer:** Use questions and answers to guide the students to explain detailed footing	**The student should be able to:** • Read the foundation plan carefully • Compute the correct dimensions of drawings • Prepare the	The foundation footings details is drawn with specifications as per construction standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods of preparing footing details	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			drawings **Demonstration:** Demonstrate to students how to create detailed footing drawings using CAD software **Activity:** Guide each student to prepare detailed footing drawings **Feedback:** Provide feedback to students on their tasks and introduce the next topic	working space • Prepare foundation footing details • Save the drawing and shut down the computer		**Principles:** The student should explain the principles involved in: • Preparing footings details **Theories:** The student should explain: • Information shown on footing drawings • Formulating detail drawing • Technical requirements of structural drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above. • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
		(c) Drawing columns details	**Question and answer:** Use questions and answers to guide the students to explain detailed column drawings **Demonstration:** Demonstrate to students on how to draw detailed column drawings by using CAD software **Activity:** Guide each student to prepare column detail drawings **Feedback:** Provide feedback to students on their tasks and introduce the	**The student should be able to:** • Read the foundation plan • Prepare the working space • Locate the reinforcement bars • Prepare the column plan • Indicate the number of reinforcements in the column • Indicate/add the dimensions • Indicate the reinforcement specifications and code	A complete set of structural column details is drawn with specifications as per construction standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods of preparing column detail drawing **Principles:** The student should explain the principles involved in: • Preparing column detail drawing **Theories:** The student should explain: • Information shown on column detail drawing • Formulating detail drawing • Technical requirements of structural drawings **Circumstantial knowledge** **Detailed knowledge about:**	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			next topic			• Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)		
		(d) Drawing beam details	**Question and answer:** Use questions and answers to guide the students to explain beam detailed drawings **Demonstration:** Demonstrate to students on how to draw detailed beam drawings by using CAD software **Activity:** Guide each student to prepare	**The student should be able to:** • Read the floor/ foundation plan • Prepare the working space • Prepare beam layout • Draw each beam individually and label them • Locate the reinforcement bars • Prepare beam sections • Indicate the number of reinforcements in the beam • Provide the dimensions • Specify the reinforcements specifications and codes	A complete set of beam details is prepared with specifications as per construction document standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods of preparing beam detail drawings **Principles:** The student should explain the principles involved in: • Preparing beam details drawing **Theories:** The student should explain: • Information shown on beam detail drawings • Formulating detail drawings	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			detailed beam drawings by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic			• Technical requirements of structural drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	• UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	
		(e) Drawing slab details	**Question and answer:** Use questions and answers to guide the students to explain slab detailed drawings **Demonstration:** Demonstrate to students on how to draw detailed slab drawings by	**The student should be able to:** • Read the floor/ foundation plan • Prepare the working space • Prepare slab layout • Locate the reinforcement bars in the slab • Indicate the dimensions • Mark the cutting lines for details preparations • Indicate the reinforcements	A complete set of slab details is drawn as per structural specifications and construction documents.	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods of preparing slab detail drawings **Principles:** The student should explain the principals involved in: • Preparing slab detailed drawings	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			using CAD software **Activity:** Guide each student to draw detailed slab drawings by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	specifications and codes • Save the drawings and shut down the computer		**Theories:** The student should explain: • Types of scales • Formulating slab detail drawings • Technical requirements of structural drawings • Arrangement of different structural drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	
		(f) Drawing stairs details	**Question and answer:** Use questions and answers to guide the students to	**The student should be able to:** • Read the floor plan • Prepare the working space • Prepare the stair	A complete set of stair structural drawings with specifications, is prepared as per construction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 –	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			explain stair detailed drawings **Demonstration:** Demonstrate to students on how to draw detailed stair drawings by using CAD software **Activity:** Guide each student to draw detailed stair drawings by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	layout • Locate the reinforcement bars in the staircase • Indicate dimensions • Mark the cutting lines for stair detail preparations • Specify the reinforcement specifications and codes • Save the drawing and shut down the computer	standards	explain the methods of preparing stair detail drawings **Principles:** The student should explain the principles involved in: • Preparing stair detail drawings **Theories:** The student should explain: • Information shown on stair detail drawings • Formulating stair detail drawings • Technical requirements of structural drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both	or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
						digital and physical storage)		
		(g) Drawing roof structure details	**Question and answer:** Use questions and answers to guide the students to explain roof structure details **Demonstration:** Demonstrate to students on how to draw roof structure details by using CAD software **Activity:** Guide each student to draw roof structure details by using CAD software **Feedback:** Provide	**The student should be able to:** • Read the floor plan • Prepare the working space • Prepare the structural roof layout • Locate the roof members • Mark the cutting lines for roof details preparations • Specify the reinforcements specifications and codes • Indicate the dimensions • Save the drawings and shut down the computer	A complete set of roof structural detail drawings with specifications is prepared as per construction standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods of preparing roof detail drawings **Principles:** The student should explain the principles involved in: Preparing roof detail drawings **Theories:** The student should explain: • Information shown on roof detail drawings • Formulating stair detail drawings • Technical requirements of structural drawings **Circumstantial**	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			feedback to students on their tasks and introduce the next topic			**knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)		
		(h) Drawing RCC wall details	**Question and answer:** Use questions and answers to guide the students to explain RCC wall details **Demonstration:** Demonstrate to students on how to draw RCC wall details by using CAD software **Activity:** Guide each student to	**The student should be able to:** • Read the floor plan • Prepare the working space • Prepare the RCC wall layout • Locate the reinforcement bars in the RCC wall • Mark the cutting lines for the RCC wall details preparations • Specify the reinforcements specifications and codes • Indicate the dimensions • Save the drawing and shut down the	A complete set of RCC wall details, with specifications, is drawn as per the specified construction standards	**evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods of preparing RCC wall detail drawings **Principles:** The student should explain the principles involved in: • Preparing RCC wall details drawing **Theories:** The student should explain: • Information shown on RCC	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU)	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			draw RCC wall details by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	computer		wall detail drawings • Formulating wall detail drawings • Technical requirements of structural drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	
		(i) Preparing structural steel details	**Question and answer:** Use questions and answers to guide the students to explain structural steel details **Demonstration:**	**The student should be able to:** • Read architectural drawings • Prepare the working space • Prepare concrete footing-steel column connection details • Prepare steel column structural	A complete set of structural steel details with specifications, is prepared according to construction standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods of preparing structural steel detail drawings **Principles:** The student should	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD)	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			Demonstrate to students on how to draw structural steel details by using CAD software **Activity:** Guide each student to draw buildings structural steel details by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	details • Prepare beam structural details • Prepare slab structural details • Prepare steel stair structural details		explain the principles involved in: • Preparing structural steel detail drawings **Theories:** The student should explain: • Information shown on structural steel details • Formulating steel detail drawing • Technical requirements of structural drawings **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
	2.2 Preparing Steel Bending Schedules	(a) Preparing structural steel specifications	**Question and answer:** Use questions and answers to guide the students to explain structural steel specifications **Demonstration:** Demonstrate to students on how to write structural steel specifications by using CAD software **Activity:** Guide each student to write structural steel specifications by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the	**The student should be able to:** • Identify the use of structural steel specifications • Recognise different types of steel materials • Interpret structural steel details • Write steel specifications	Structural steel specifications are prepared as per construction standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain methods involved in the preparation of steel specifications **Principles:** The student should explain the procedures of: • Steel scheduling • Specification for steel design **Theories:** The student should explain: • Type of steel reinforcement bar • Spacing steel reinforcements **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Word processing software (e.g. Microsoft Word) • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	75

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			next topic			• Storage of drawings (both digital and physical storage)		
		(b) Preparing bar bending schedules	**Question and answer:** Use questions and answers to guide the students to explain bar bending schedules **Demonstration:** Demonstrate to students on how to prepare a bar bending schedule **Activity:** Guide each student to prepare bar bending schedules for specified structural members as per instruction	**The student should be able to:** • Read structural drawings • Identify all reinforcement bars, including their locations, sizes, and grades Classify bar shapes • Calculate the total length of each bar • Create a table with columns like bar mark, bar size, quantity, length, shape, and weight • Sum up total lengths and weights • Include bar bending diagrams	Bar bending schedules for steel reinforcement are prepared as per standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain methods involved in the preparation of steel bending schedules **Principles:** The student should explain the procedures of: • Steel scheduling • Specification for bar bending schedule design • Preparation of bar bending schedule **Theories:** The student should explain: • Type of steel reinforcement bars • Reinforcement bar shapes • The application	The following tools, equipment, and safety gear are to be available: • Licensed CAD software (example) AutoCAD 2007 – or above versions • Spreadsheet software (e.g. Microsoft Excel) • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product Assessment	Knowledge Assessment		
			Feedback: Provide feedback to students on their tasks and introduce the next topic			of bending schedules **Circumstantial knowledge** **Detailed knowledge about:** • Proper handling of computer • Printing of drawings • Storage of drawings (both digital and physical storage)	500W • Printing paper • Flash disc 4 GB or above	

Form Four

Table 6: *Detailed Contents for Form Four*

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
1. Performing Architectural Design	1.1. Performing Basic Design Procedures	(a) Identifying design procedures for simple building project	**Question and answer:** Use questions and answers to guide the students to explain the concepts of building needs and the relation between the building and its environment **Demonstration:** Demonstrate to students on how to interpret the client needs and site conditions of a given site **Role play:** Organise the students into pairs or small groups, where one student will assume the role of the client, and the others will take notes on the	**The student should be able to:** • Interpret user/client requirements • Assess the site conditions (soil type, topography, climate, accessibility, etc.)	A complete set of user/client needs and site conditions to guide the design process are identified	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in the interpretation of client/user requirements **Principles:** The student should explain the principles of: • Interpretation of user/client requirements • Site analysis **Theories:** The student should explain: • Anthropometric studies • Site conditions studies **Circumstantial knowledge** **Detailed**	The following tools, equipment, and safety gear are to be available: • Notebook • Note pad/sketchbook • Camera • Pencil • Sharpener • Measuring tapes • Water hose pipe • A straight timber board • Clear safety glasses • Masks • Helmets • Gloves • A pair of compasses • Ranging poles • Dumpy level • Panga • Scientific calculator • Steel arrows • Hammer	168

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			client's needs for designing a residential house **Field visit:** Organise the students into groups or assign them individually to visit selected sites in order to analyse the site conditions that impact or influence design decisions and procedures for the residential house, as noted in the role-play activity **Individual assignment:** Assign tasks to students on identifying design procedures for simple building projects **Feedback:** Provide feedback to students on their tasks and introduce the next topic			**knowledge about:** • Completeness of the user/client requirements • Completeness of the site conditions information		

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				Process Assessment	Services Assessment	Knowledge Assessment		
		(b) Preparing room (rooms) schedule and concept development	**Demonstration:** Demonstrate to students how to prepare a room schedule and generate different design concepts based on client needs and site conditions **Activity:** Guide each student to prepare room schedule and generate different design concepts from the client needs and site conditions **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Determine space requirements • Create sketch layouts to visualise different possible spatial arrangements • Sketch side views and 3D drawings to visualise the object's forms, aesthetics, and style • Present different house form layouts to the user/client to choose an appealing design • Clean the workshop and store tools as per storage principles	Proposals of outline design sketches conforming to technical specifications	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in the preparation of an outline design **Principles:** The student should explain the principles of: • Analysing user requirements • Generating design requirements • Preparing sketch outline **Theories:** The student should explain: • Anthropometric studies • Spatial organisation • Concept development • Development of design programme • Design	The following tools, equipment, and safety gear are to be available: • Drawing board • T -square • Set squares • Clutch pencil/pencil • Pencil sharpener • Scale rule	

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				Process Assessment	Services Assessment	Knowledge Assessment		
						procedures **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling drawing tools • Logical organisation of spaces		
	1.2. Preparing Sketch Designs by using CAD Software	(a) Developing design concepts by using ARCHICAD	**ICT based-learning:** Prepare videos demonstrating how to install ARCHICAD and use it to prepare both 3D and 2D views **Activity:** Guide each student to prepare both 3D and 2D views of the conceived projects **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Connect computer peripherals • Install ARCHICAD software • Launch ArchiCAD • Create a new project • Choose Template • Go to Options > Project Preferences > Working Units to set units (e.g., meters, feet etc.) • Compute the measurements on the sketch drawings • Go to the Project Map and click on any storey level • Set the height of each storey to define the height between	A 3D and 2D views of the design idea are prepared in ARCHCAD as per design standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in the preparation of an outline design **Principles:** The student should explain the principles of: • Analysing user requirements • Generating design requirements • Preparing sketch outline	The following tools, equipment, and safety gear are to be available: • Design standards and guidelines • Licensed ARCHCAD 2015 or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU)	168

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				storeys • Select the Wall Tool from the toolbar • Define wall properties (height, thickness, material) in the settings • Draw walls by clicking to define start and end points • Select the Door Tool or Window Tool • Choose a style and size, then click on a wall to place it • Use the Slab Tool to define the floor area • Adjust the slab thickness and materials as needed • Add furniture or fixtures using the Object Tool • Choose object items from the library • Click on the Roof Tool and go to its setting to define different parameters as pitch, materials • Draw the roof by tracing around the building walls • Select the Elevation		**Theories:** The student should explain: • Anthropometric studies • Spatial organisation • Concept development • Development of design programme • Design procedures **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling drawing tools • Logical organisation of spaces	NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				Tool and place markers around your floor plan to define the viewpoints • Double-click an elevation marker or navigate to the Project Map (left-hand navigator) and open the elevation view • Adjust visibility, or tweak design elements directly in the elevation view • Use the Dimension Tool to add measurements to your plan and elevations • Use the Text Tool or label tool to annotate • Switch to the 3D View (click the 3D icon or press F5) to see the model in 3D • Adjust the camera and render settings for a better visual representation • Save the drawings • Manage the storage of drawings on the computer				

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				• Save the drawings and shut down the computer				
		(b) Drawing site layout and floor plan	**Demonstration:** Demonstrate to students on how to draw site layouts and floor plans by using CAD software **Activity:** Guide each student to draw site layouts and floor plans by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Run ARCHICAD • Compute measurements on the sketch drawing • Prepare the working space in ARCHICAD • Draw site the layout plan • Develop and draw the floor plan from the design idea you previously conceived • Perform lettering of the drawings • Save the drawings and shut down the computer	Site layout and floor plan are drawn as per requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods used in the preparation of site layout and floor plan drawings **Principles:** The student should explain the principles of: • Formulation of shapes • Determination of spatial requirements • Projection of forms **Theories:** The student should explain: • Analyse preliminary design requirements • General design theory	The following tools, equipment, and safety gear are to be available: • Licensed ARCHCAD 2015 or above versions • Computer with RAM 8 GB or above. • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper. • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Types of architectural forms • Composition forms **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling of computer • Observation of standards		
		(c) Drawing elevation views	**Demonstration:** Demonstrate to students on how to draw building elevations by using CAD software **Activity:** Guide each student to draw building elevations by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Run ARCHICAD • Compute measurements on the sketch drawing • Prepare the working space in ARCHICAD • Develop and draw building elevations • Perform lettering of the drawings • Save the drawings and shut down the computer	Building elevation views are drawn as per requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods used in the preparation of building elevations **Principles:** The student should explain the principles of: • Formulating shapes • Determinations of spatial requirements • Projecting	The following tools, equipment, and safety gear are to be available: • Licensed ARCHCAD 2015 or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						forms **Theories:** The student should explain: • Analyse preliminary design requirements • General design theory • Types of architectural forms • Composition forms **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling of computer • Observation of standards	card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	
		(d) Drawing sectional views	**Demonstration:** Demonstrate to students on how to draw building sectional drawings by using CAD software **Activity:** Guide each student	**The student should be able to:** • Run ARCHICAD • Compute measurements on the sketch drawing • Prepare the working space in ARCHICAD • Develop and draw building sectional	Building sectional views drawn as per requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods used in the preparation of building sectional	The following tools, equipment, and safety gear are to be available: • Licensed ARCHCAD 2015 or above versions • Computer with RAM 8 GB or above • Computer with 500	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			to draw building sectional drawings by using CAD software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	drawings of the parts that need to be shown in detailed • Perform lettering of the drawings • Save the drawings and shut down the computer		drawings **Principles:** The student should explain the principles of: • Formulating of shapes • determination of spatial requirements • Projecting of forms **Theories:** The student should explain: • Analyse preliminary design requirements • General design theory • Types of architectural forms • Composition forms **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling of computer • Observation of	GB storage (HDD) or above/ 256 GB storage (SSD) or above. • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						standards		
		(e) Rendering 3D drawings by using software	**Question and answer:** Use questions and answers to guide the students to explain rendering of drawings and their applications **Demonstration:** Demonstrate to students on how to render 3D drawings by using software **Activity:** Guide each student to render 3D drawings by using software **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Develop a 3D model in CAD software and export it in a format supported by the rendering software • Open the rendering software • Start a new project • Import the 3D model • Adjust terrain and environment • Replace materials with the rendering software's library • Add lighting, objects, and fine-tune the settings • Adjust camera for an appropriate view • Add rendering effects like real skies, reflections, shadows, and colour • Test the render by creating a draft render • Render high-quality images or animations, selecting the desired resolution and quality settings	3D drawings produced by using rendering software	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods used in the preparation of 3D renders **Principles:** The student should explain the principles of: • Formulating of shapes • Determining of spatial requirements • Projecting of forms • Colour composition and aesthetics **Theories:** The student should explain: • General design theory • Types of architectural forms • Composition	The following tools, equipment, and safety gear are to be available: • CAD software (e.g. ARCHICAD or Sketch up) • Rendering software e.g. Twin motion, V-Ray, Key Shot, Lumion, Real time, Atlantis • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				• Save the drawings and shut down the computer		forms • Colour composition **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling of computer • Observation of standards	above	
	1.3. Preparing Architectural Brief	(a) Preparing project requirements and contents	**Question and answer:** Use questions and answers to guide the students to explain how to prepare project's requirements from the client needs and site conditions **Demonstration:** Demonstrate to students on how to prepare project's requirements from the client needs and site conditions **Activity:** Guide each student to prepare project's	**The student should be able to:** • Study the site organisation and zoning • Read client's proposal and priorities • Prepare the offer acceptance document • Prepare a formal list of requirements • Check on all the land terrain and physical features • Work on the feasibility study • Prepare various design schedules	Project requirements and contents are prepared and written conforming to design requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method Used:** The student should explain necessary procedures used in preparing architectural briefs according to architectural specifications **Principles:** The student should explain principles involved in: • Establishing functional requirements of project	The following tools, equipment, and safety gear are to be available: • Office Furniture • Standard method of measurement • Schedule of rates • Drawing equipment • Printing facilities • Rulers • Pens • Drawing pens • Word processing software e.g. Microsoft Word • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit	168

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			requirements from the client needs and site conditions **Feedback:** Provide feedback to students on their tasks and introduce the next topic			• Spatial analysis of the rooms • Schedule of Materials • Developing Project Programme • Planning for the tasks and responsibilities of technical people, the architect and client • Preparing preliminary cost estimates **Theories:** The student should explain: • Site physical properties • The client organisation requirement • Climatic analysis • Organisation structure Concept Development • Room and Spatial	with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						analysis • The cost estimates • Design Proposal **Circumstantial knowledge** **Detailed knowledge about:** • Health and Safety requirements • Project Impact on Environment • Regulatory issues (CRB, AQRB, ERB, MISNISTRIES…)		
		(b) Presenting an Architectural brief	**Question and answer:** Use questions and answers to guide the students to explain organisation and presentation of a brief **Demonstration:** Demonstrate to students on how to organise and	**The student should be able to:** • Organise the brief content logically • Check the consistency of the brief formatting • Select the method of binding the brief • Select binding materials • Prepare the cover page • Prepare	Logically compiled brief with consistent format, clear illustrations, and appropriate binding	**Knowledge evidence:** **Detailed knowledge of:** **Method Used:** The student should explain necessary procedures used in compiling and binding a brief **Principles:** The student should explain principles involved in:	The following tools, equipment, and safety gear are to be available: • Office Furniture • Drawing equipment • Printing facilities • Rulers • Pens • Paper cutter or trimmer • Binding machine • Binding supplies • Folders and	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			present a brief **Activity:** Guide each student to to organise and present a brief in front of the class	separators/dividers for different sections of the brief • Add supporting documents in the appendix for reference (e.g. building regulations)		• Organising a brief • Presentation of a brief **Theories:** The student should explain: • Sections of a brief • Methods of compiling a brief • Annotation of drawings in the brief **Circumstantial knowledge** **Detailed knowledge about:** • Regulatory issues (CRB, AQRB, ERB, MISNISTRIES…)	portfolios • Drawing pens	
	1.4. Performing Building Refurbishment	(a) Preparing Proposals for additions/alterations of uses	**ICT based-learning:** Prepare relevant videos on surveying of an existing building conditions and surroundings	**The student should be able to:** • Select tools • Survey the existing building's layout and dimensions • Document the current condition and structure of the	A set of working drawings illustrating additions/alterations of use to the building	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in producing	The following tools, equipment, and safety gear are to be available: • Licensed ARCHCAD 2015 or above versions • Computer with RAM 8 GB or above	171

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Field visit/: Organise the students in small groups to survey a small building within the school compound **Activity:** Guide each student to propose additions/alterations of use to the existing building **Feedback:** Provide feedback to students on their tasks and introduce the next topic	building • Collect existing building drawings if available or draw them if not available • Analyse the site and zonal regulations • Interpret user/client requirements • Prepare conceptual drawings and sketches • Prepare sketch floor plans, elevations, and sections to illustrate the modifications • Present the drawings to the user/client for feedback • Incorporate the client's comments • Draw floor plans • Draw the site layout plan • Draw elevations • Draw the section drawing • Draw details		refurbishment works drawings **Principles:** The student should explain the principles of: • Producing drawings of alteration/additions to building structure **Theories:** The student should explain: • The application of symbols to differentiate new extension from original design • The application of construction materials expressions • Building regulations (development conditions) • Determination of built-up area.	• Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above. • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						Circumstantial knowledge **Detailed knowledge about:** • Safe handling of computer and drawing tools • Observation of standards and health regulations		
		(b) Preparing scheduling of materials on alterations/additions	**Activity:** Guide each student to propose materials and indicate them by using symbols on the drawings **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Select tools as per range statement • Prepare the working space • Draw floor plan, drawings, section, and elevations • Write dimensions • Write/express correct material symbols on floor plan and section drawings	Correct application of material symbols conforming to set standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in the writing of specifications on a drawing **Principles:** The student should explain the principle of: • Labelling a drawing • Rendering a drawing **Theories:** The student should	The following tools, equipment, and safety gear are to be available: • Licensed ARCHCAD 2015 or above versions • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						explain: • The application of symbols to differentiate new extension from original design • The application of construction materials expression • Labelling techniques • Rendering • Dimensioning **Circumstantial knowledge** **Detailed knowledge about:** • Handling of computer and drawing tools • Storage of drawings (transparencies) • Observation of standards and building regulations	Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
		(c) Preparing specifications for refurbishment	**Activity:** Guide each student to prepare specifications for the refurbishment works as per standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	**The student should be able to:** • Select tools as per range statement • Prepare the working space • Draw floor plan, drawings, section, and elevations • Write dimensions • Write/express correct material symbols on section drawings. • Write specifications on floor plan and section drawings	Materials and symbols are correctly applied, and specification text is well-written to conform to established standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in the writing of specifications on a drawing **Principles:** The student should explain the principles of: • Labelling a drawing • Rendering a drawing **Theories:** The student should explain: • The application of symbols to differentiate new extension from original design • Representation of data • The application of construction	The following tools, equipment, and safety gear are to be available: • Licensed ARCHCAD 2015 or above versions • Word processing software e.g. Microsoft Word • Computer with RAM 8 GB or above • Computer with 500 GB storage (HDD) or above/ 256 GB storage (SSD) or above • Video display unit with resolution 1440 x 900 or above • Computer with dedicated graphics card (GPU) NVIDIA or Radeon series • Plotter or printer • UPS unit at least 500W • Printing paper • Flash disc 4 GB or above	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						materials expression • Labelling techniques • Rendering • Dimensioning **Circumstantial knowledge** **Detailed knowledge about:** • Handling of tools • Storage of drawings (transparencies) • Observation of standards and building regulations		
2. Performing Architectural Practice and Regulations	2.1 Applying Building Law	(a) Identifying building regulations and law	**Question and Answer:** Use questions and answers to guide the students to explain the meaning of law and building laws and regulations **Internet and library search:** Guide the students in groups	**The student should be able to:** • Consult the local authority or government website for project location requirements • Review local zoning maps and planning regulations for land use and building limitations • Consult fire safety codes	Documented building regulations conform to architectural standards and building law	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in applying building law **Principles:** The student should explain the principles of:	The following tools, equipment, and safety gear are to be available: • Scientific calculators • Building by-laws • Schedule of agreement and conditions of contract • Form of contract	75

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			to search relevant building and environmental laws and regulations in Tanzania **Guest speaker:** Invite an official from either the local authority or building and construction boards (ERB, AQRB) to speak on building laws and regulations **Individual assignment:** Assign the students the task of identifying building regulations and laws according to international standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Verify accessibility standards, including those for people with disabilities • Review energy and environmental codes, such as those of NEMC Check the requirements for building permit applications at local authorities		• Building protection • Layout planning • Space determination **Theories:** The student should explain: • State advantages of setbacks • Calculate plot coverage of a building site • Define pedestrian facilities – arcades, walkways and easements • Describe conditions of contract • Describe forms of contracts **Circumstantial knowledge** **Detailed knowledge about:** • Health and safety requirements		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Environmental planning and protection		
		(b) Identifying factors and conditions for development	**ICT based-learning:** Prepare relevant videos on factors and conditions that influence development of a site **Field visit:** Organise The students into small groups to visit a site destined for construction of a residential house for them to analyse factors that will influence the development of the site **Individual assignment:** Assign each student the task of identifying concrete according to standards	**The student should be able to:** • Analyse site location and context, including accessibility, transport, and utilities • Analyse topography and land features, such as terrain and natural features like rivers • Analyse climate and weather, including temperature, rainfall, and winds • Assess existing infrastructure, including availability of water, electricity, sewage, and internet connectivity, as well as the impact of nearby infrastructure on the project (e.g., noise) • Analyse zoning and land use laws, such as permitted land uses (residential, commercial) and	Well-prepared building regulations conform to architectural standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain the methods involved in applying building law **Principles:** The student should explain the principles of: • Building protection • Layout planning • Space determination **Theories:** The student should explain: • State advantages of setbacks • Calculate plot coverage of a building site • Define pedestrian	The following tools, equipment, and safety gear are to be available: • Scientific calculators • Building by-laws • Schedule of agreement and conditions of contract • Land use plans and regulations • Form of contract	

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				Process Assessment	Services Assessment	Knowledge Assessment		
			Feedback: Provide feedback to students on their tasks and introduce the next topic	limitations (height, setbacks, density) • Ensure compliance with building codes, including local and national construction standards for fire safety, structural integrity, and accessibility requirements • Review environmental regulations, such as conservation requirements for protected areas or ecosystems, and secure permits for tree removal, water usage, or air quality impacts • Verify the validity of ownership or the title deed for the plot • Analyse natural hazards in the area • Evaluate the availability of resources and technology for construction • Apply construction rules and regulations		facilities – arcades, walkways and easements • Describe conditions of contract • Describe forms of contracts **Circumstantial knowledge** **Detailed knowledge about:** • Health and safety requirements. • Environmental planning and protection		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				• Incorporate design principles and requirements • Integrate planning requirements into the design • Implement engineering requirements • Adhere to contract procedures				
3. Performing Building Estimates and Costing	3.1. Performing Building Estimates	(a) Preparing building estimates	**Questions and answers:** Use questions and answers to guide the students to explain the meaning of building estimates **Demonstration:** Demonstrate to the students on how to take measurements of building works and prepare building estimates by following standard methods of measurements **Activity:** Guide each student to take	**The student should be able to:** • Interpret drawing for taking off • Select tools and materials • Prepare the taking off page • Prepare a descriptive list of activities to be performed • Take off building measurements	Building quantities determined according to required standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain methods involved in: • Preparing a "taking off" page • Construction activities for quantity taking off • Computing quantities in volume, area or unit **Principles:** The student should explain the principles of:	The following tools, equipment, and safety gear are to be available: • Scientific calculators • Ruler • Standard methods of measurement (SMM) • A computer • Spreadsheet software e.g. Microsoft Excel	56

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			measurements of building works and prepare building estimates by following standard methods of measurements **Feedback:** Provide feedback to students on their tasks and introduce the next topic			• Taking-off • Building up quantities • Determination of rates **Theories:** The student should explain: • Define "taking off" • The list of construction activities applied to a building • Type of measurement of quantities • List of measured items **Circumstantial knowledge** **Detailed knowledge about:** • Accuracy of quantities calculated • Observation of standards		
		(b) Preparing bill of quantities and material specifications	**ICT based-learning:** Prepare relevant videos on	**The student should be able to:** • Select materials • Gather the taking-off	Bill of Quantities (BoQ) prepared according to	**Knowledge evidence:** **Detailed knowledge of:**	The following tools, equipment, and safety gear are to be available: • Scientific	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			preparations of Bill of Quantities (BoQ) **Activity:** Guide each student to prepare a Bill of Quantity (BoQ) according to standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	sheet, architectural, structural, and service drawings • Review design specifications and project scope documents to understand construction requirements • Prepare the BoQ according to the standard format • Identify the unit of measurement for each component (e.g., m^3 for concrete, m^2 for plastering) • Group construction elements into categories aligned with the BoQ structure • List items with details based on type and location • Specify measurement units (e.g., m^2, m^3, pcs) • Insert quantities from the measurement sheet • Obtain rates from market research,	required standards	**Method used:** The student should explain methods involved in: • Preparing a Bill of Quantities and materials specifications **Principles:** The student should explain the principles involved in: • Taking-off • Building up quantities • Determination of rates • Preparing BoQ **Theories:** The student should explain the: • Definition of BoQ • Main parts or sections of a BoQ • Importance of a BoQ • Materials specifications • Importance of	calculators • Ruler • Standard methods of measurement (SMM) • Materials and works rates from the market • A computer • Spreadsheet software e.g. Microsoft Excel	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				suppliers, or historical data and insert them • Multiply quantities by rates for each item to calculate amounts • Draft material specifications, defining quality, standards, and details for materials (e.g., Concrete: Grade: C25/30) • Fill material specifications in a table according to standards		materials specifications **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling the paper materials • Accuracy of costs entered in the Bill of Quantities		
	3.2. Performing Cost Estimates	(a) Writing schedule of rates	**Questions and answers:** Use questions and answers to guide the students to explain how to schedule of rates of construction items can be developed **Demonstration:** Demonstrate to students on how to develop a schedule of rates of a construction item	**The student should be able to:** • Determine cost rate of an activity • Fill cost rate as per activities column	A quantified list of work activities conforming to the estimating standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to build rates of a building work **Principles:** The student should explain the principles of: • Building an activity rate • Building an	The following tools, equipment, and safety gear are to be available: • Scientific calculators • Market prices of materials and construction works • Ruler • Computer • Spreadsheet software e.g. Microsoft Excel software	56

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			by considering different activities involved **Activity:** Guide each student to prepare schedule of rates of building work items by considering different activities involved **Feedback:** Provide feedback to students on their tasks and introduce the next topic			activity cost **Theories:** The student should explain: • The elements constituting an activity rate • The percentages of the elements that build rate **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling of tools • Accuracy of built rates		
		(b) Preparing costing estimates	**Questions and answers:** Use questions and answers to guide the students to explain how to prepare cost estimates of construction items can be developed **Demonstration:** Demonstrate to students on how a	**The student should be able to:** • Select tools • Review the available schedule or rates • Perform costing of works	A quantified list of work activities with a total cost, prepared as per estimating standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to cost a building work **Principles:** The student should explain the principles of: • Building an activity rate	The following tools, equipment, and safety gear are to be available: • Scientific calculators • Schedule of rates • Ruler • Computer • Spreadsheet software e.g. Microsoft Excel software	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			cost estimate of a construction item can be built by considering different activities involved **Activity:** Guide each student to prepare cost estimates of building works by considering different activities involved **Feedback:** Provide feedback to students on their tasks and introduce the next topic			• Building an activity cost **Theories:** The student should explain: • The elements constituting an activity rate • The percentages of the elements that build rate **Circumstantial knowledge** **Detailed knowledge about:** • Safety on handling of tools • Accuracy of costs		
4. Performing Construction Management Practice	4.1. Performing Site Works	(a) Preparing technical report	**Internet and library search:** Guide the students in groups or individually to search on preparation of technical report for construction works **Field visit:** Organise the	**The student should be able to:** • Read and interpret drawings • Prepare the office log book • Undertake materials inspection • Enter technical data into logbook • Write monthly and annual reports	Technical reports are prepared according to standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Prepare technical reports for site works **Principles:** The	The following tools, equipment, and safety gear are to be available: • Standard method of measurements and specifications • Scientific calculators • Current schedule of rate for building materials • Formats for taking	21

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			students in groups or the whole class to visit a building site to study the process of preparing technical report for site works **Group discussion:** Guide the students to present their findings from field works and literature searches and discuss on the procedures and content of a technical report **Individual assignment:** Assign each student the task of preparing a work report according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			student should explain the principles of: • Report writing and reporting • Assessing of work and quality control **Theories:** The student should explain: • Organisation of building team • Tasks performed by members of building teams • Activities of the construction industry • Formation of contract • Duties, responsibilities and right to contracts • Contractual requirements of projects • Legal liabilities of the key players	off quantities	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Technical reports **Circumstantial knowledge** **Detailed knowledge about:** • Site safety and health • Work environmental requirement • First aid kit and service • Firefighting equipment		
		(b) Preparing material quality report	**Internet and library search:** Guide the students in groups or individually to search on preparation of material quality report for construction works **Field visit:** Organise the students in groups or the whole class to visit a building site to study the process	**The student should be able to:** • Read and interpret drawings • Take materials samples for tests at approved laboratories • Write duty specifications for site workers • Prepare the office log book • Undertake materials inspection • Enter technical data into logbook	Material quality reports are prepared according to standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain methods to: • Keep site records • Perform quality control methods • Perform contract management practice **Principles:** The student should	The following tools, equipment, and safety gear are to be available: • Standard method of measurements and specifications • Scientific calculators • Current schedule of rate for building materials • Formats for taking off quantities • Material test results from approved laboratories	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			of preparing material quality report for site works **Group discussion:** Guide the students to present their findings from field works and literature searches and discuss on the procedures and content of a material quality report **Individual assignment:** Assign each student the task of preparing a material quality report according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			explain the principles related to: • Contract management • Report writing and reporting • Assessing of work and quality control **Theories:** The student should explain: • Organisation of building team • Tasks performed by members of building team • Activities of the construction industry • Formation of contract • Schedules of agreement and forms of conditions • Duties, responsibilities and right to contracts		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Contractual requirements of projects • Legal liabilities of the key players • Work inspection and commissioning **Circumstantial knowledge** **Detailed knowledge about:** • Site safety and health • Work environmental requirement • First aid kit and service • Firefighting equipment		
		(c) Monitoring labour performance	**Internet and library search:** Guide the students in groups or individually to search on how to monitor labour performance at a construction site **Field visit:**	**The student should be able to:** • Read and interpret drawings • Write duty specifications for site workers • Evaluate work performed • Write duty, monthly and annual reports	Achieved specified work standards and technical performance on site	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The Student should explain how to: - • Keep site records • Perform quality control	The following tools, equipment, and safety gear are to be available: • Standard method of measurements and specifications • Scientific calculators • Current schedule of rate for building materials	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Organise the students in groups or the whole class to visit a building site to study how to monitor labour performance at a construction site **Group discussion:** Guide the students to present their findings from field works and literature searches and discuss on how to monitor labour performance at a construction site **Individual assignment:** Assign each student the task of monitoring labour performance according to standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			methods • Perform contract management practice **Principles:** The student should explain the principles related to: • Contract management • Assessing of work and quality control **Theories:** The student should explain: • Organisation of building team • Tasks performed by members of building teams • Activities of the construction industry • Formation of contract • Schedules of	• Formats for taking off quantities	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						agreement and forms of conditions • Duties, responsibilities and right to contracts • Contractual requirements of projects • Legal liabilities of the key players • Work inspection and commissioning **Circumstantial knowledge** **Detailed knowledge about:** • Site safety and health • Work environmental requirement • First aid kit and service • Firefighting equipment		
	4.2. Performing Survey	(a) Determining boundaries	**ICT based-learning:** Prepare relevant videos on procedures for	**The student should be able to:** • Obtain the survey plan, which includes boundary lines,	Boundaries of a site are determined	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The	The following tools, equipment, and safety gear are to be available: • Levelling instrument • Levelling staff	21

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			determining boundaries of a site **Field visit/:** Organise the students in groups to determine boundaries of the school compound or a nearby site **Group discussion:** Guide the students to discuss the procedures from the videos and their work at site **Individual assignment:** Assign each student the task of determining the site survey according to required standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	measurements, and reference markers • Review the legal description of the property, which may include geodetic coordinates, reference to adjacent properties or landmarks • Check official records at the local land registry or cadastral office		student should explain different ways of: • Taking readings • Booking readings **Principles:** The student should explain the different principles related to: • Taking and booking reading • Surveying terminologies **Theories:** The student should explain: • Booking and calculating • Set straight lines • Surveying terminologies **Circumstantial knowledge Detailed knowledge about:** • Environmental issues	• Measuring tapes • Ranging poles. • Site square • Chains • Club hammer • Helmet	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
		(b) Determining benchmark and beacon	**ICT based-learning:** Prepare relevant videos on procedures for determining bench mark and beacon **Field visit/:** Organise the students in groups to determine bench mark and beacon of the school compound or a nearby site **Group discussion:** Guide the students to discuss the procedures from the videos and their work at site **Individual assignment:** Assign each student the task of determining the site benchmark and beacon according to technical standards	**The student should be able to:** • Identify boundary markers or monuments mentioned in the plan • Establish temporary bench marks	Bench marks and beacons are determined according to requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain different ways of: • Determining beacons and bench marks of a site **Principles:** The student should explain the different principles of: • Taking and booking reading • Surveying terminologies **Theories:** The student should explain: • Meaning of benchmarks and beacons • Importance of benchmarks and beacons • Surveying terminologies	The following tools, equipment, and safety gear are to be available: • Levelling instrument. • Levelling staff • Measuring tapes • Ranging poles • Set square • Chains • Club hammer • Helmet	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Feedback: Provide feedback to students on their tasks and introduce the next topic			• Care of instruments **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions related to surveying instruments • Environmental issues • First aid		
		(c) Taking readings and booking	**ICT based-learning:** Prepare relevant videos on procedures for taking readings and booking in a survey works **Field visit/:** Organise the students in groups to take readings and booking of survey works of the school compound or a nearby site **Group discussion:**	**The student should be able to:** • Select surveying instrument • Search for boundary markers (metal stakes, concrete posts, etc.) as described in the survey plan • Use a GPS device to identify coordinates of known points • Identify alternative reference points if markers are missing or damaged • Measure distances and angles between	Surveyed site boundaries conforming to technical specifications.	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The Student should explain different ways of: • Taking readings • Booking readings • Set out angles • Computing methods **Principles:** The student should explain the different principles of:	The following tools, equipment, and safety gear are to be available: • Levelling instrument • Levelling staff • Measuring tapes • Ranging poles • Site square • Chains • Club hammer • Helmet • GPS device • Theodolite • Total station	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Guide the students to discuss the procedures from the videos and their work at site **Individual assignment:** Assign each student the task of preparing a material quality report according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	boundary markers using a total station or theodolite • Compare field measurements to those in the existing survey plan • Mark the boundaries with visible stakes or flags for clarity • Use a compass or total station to verify directional bearings between boundary points • Record observations • Document any discrepancies between the survey plan and actual field conditions • Clean tools and store them		• Taking and booking reading • Surveying terminologies **Theories:** The student should explain: • Surveying instruments • Set and reading Instruments • Set angles • Set straight lines • Surveying terminologies • Care of instruments **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions related to surveying instruments • Environmental issues • First aid		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
		(d) Booking levelling readings	**ICT based-learning:** Prepare relevant videos on procedures for booking levelling readings **Field visit/:** Organise the students in groups to book levelling readings of the school compound or a nearby site **Group discussion:** Guide the students to discuss the procedures from the videos and their work at site **Individual assignment:** Assign each student the task of booking levelling readings according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce	**The student should be able to:** • Select surveying instruments • Set levelling instrument • Focus and sight levelling staff • Take readings • Book reading • Calculate reduced levels (RL) • Plot levels • Set angles • Set straight line • Clean tools and store them	Surveyed site levels conforming to technical specifications	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The Student should explain different ways of: • Taking readings • Booking readings • Set out angles • Computing methods **Principles:** The student should explain the different principles of: • Setting levelling instruments. • Taking and booking reading • Surveying terminologies **Theories:** The student should explain: • Surveying instruments • Set and reading • Instruments • Booking and	The following tools, equipment, and safety gear are to be available: • Levelling instrument • Levelling staff • Measuring tapes • Ranging poles • Site square • Chains • Club hammer • Helmet	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			the next topic			calculating • Reduced levels • Set angles • Set straight lines • Transferring levels • Surveying terminologies • Care of instruments **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions related to surveying instruments • Environmental issues • First aid		
		(e) Analysing data by HI and RF	**ICT based-learning:** Prepare relevant videos on procedures for analysing data by HI and RF **Field visit/:** Organise the students in groups	**The student should be able to:** • Set the Benchmark (BM) • Determine the Height of Instrument (HI) • Calculate Reduced Levels (RL) • Repeat for Intermediate Points • Document in a	Surveyed site conforms to technical specifications	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain different ways of: • Taking readings • Booking readings • Set out angles	The following tools, equipment, and safety gear are to be available: • Levelling instrument • Levelling staff • Measuring tapes • Ranging poles • Site square • Chains • Club hammer	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			to analyse data of the school compound or a nearby site by HI and RF **Group discussion:** Guide the students to discuss the procedures from the videos and their work at site **Individual assignment:** Assign each student the task of analysing data using HI and RF according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	Levelling Table • Calculate the Rise or Fall • Clean tools and store them		• Computing methods **Principles:** The student should explain the different principles of: • Setting levelling instruments • Taking and booking reading • Surveying terminologies **Theories:** The student should explain: • Surveying instruments • Set and reading • Instruments • Booking and calculating • Reduced levels • Set angles • Set straight lines • Transferring levels • Surveying terminologies • Care of instruments	• Helmet	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						Circumstantial knowledge **Detailed knowledge about:** • Safety precautions related to surveying instruments • Environmental issues • First aid		
	4.3. Managing Personal and Environmental Safety	(a) Handling hazards	**Internet and library search:** Guide the students in groups or individually to search on how to handle hazards at a construction site **Field visit:** Organise the students in groups or the whole class to visit a building site to study how to handle hazards at construction sites **Group discussion:** Guide the students to present their	**The student should be able to:** • Interpret service manuals • Select tools and equipment • Use OSHA rules and regulations • Prepare the workshop inspection report • Prepare the workshop colour code and safety signs • Identify any safety hazardous materials • Handle physical, mechanical, chemical, and ergonomic hazards • Conduct safety awareness training to sub-ordinates	Hazards are handled according to OSHA's rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Interpret OSHA rules and regulations • Use safety gears • Prepare preventive maintenance schedule and inspection report • Prepare warning signs and safety	The following tools, equipment, and safety gear are to be available: • Electrical equipment • Mechanical equipment • Power machines • Measuring tools • Cutting tools • First aid kit • Fire extinguishers • Service manuals • OSHA rules and regulations • Helmet • Gloves • Earplugs • Mask	21

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			findings from field works and literature searches and discuss on how to handle hazards at a construction site **Individual assignment:** Assign each student the task of describing how to handle hazards in accordance with workshop standards and safety procedures **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Manage uses of safety gear • Cleaning tools and equipment • Storing tools and equipment		instructions • Conduct assessment • Carry out accident investigation • Monitor safe working environment • Manage uses of safety gears **Principles:** The student should explain the principles related to: • Preparing inspection check lists • Preparing warning signs and safety instructions • Identifying hazards materials • Preparing and conducting training • Handing hazardous materials **Theories:** The		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						student should explain: • Function of inspection check list • Importance of posting warning sign and safety instructions • Advantages of risk assessment • Importance of carry out accident investigation • Importance of monitor safety at working place **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while manage hazards • Safe handling of tools and equipment • Waste disposal		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
		(b) Carrying out risk assessment	**Internet and library search:** Guide the students in groups or individually to search on how to carry out risk assessment at a construction site **Field visit:** Organise the students in groups or the whole class to visit a building site to study how to carry out risk assessment at construction sites **Group discussion:** Guide the students to present their findings from field works and literature searches and discuss on how to carry out risk assessment at a construction site **Individual**	**The student should be able to:** • Interpret service manuals • Select tools and equipment • Inspect the site for hazards such as: Falling objects, Electrical risks, Slips, and trips • Supervise practice safe workshop practices to protect yourself, other, and properties • Respond correctly and safely when faced with an emergency • Identify and use correctly all emergency equipment and supplies • Make periodic inspections of the workshop area and all equipment and prepare a report • Conduct the safety training • Identify any safety	Risk assessment carried out as per OSHA standard and regulations	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: • Conduct safety training • Identify safety hazardous materials • Handle hazardous materials • Prepare inspection report **Principles:** The student should explain the principles of: • Reacting correctly and safely when faced with an emergency • Identification of emergency equipment and supplies • Identifying safely	The following tools, equipment, and safety gear are to be available: • Service manuals • OSHA rule and regulations • Workshop rules and regulations • Camera • Risk assessment sheet • Mask • Earplugs • Gloves • Overalls • Safety boots • Clear safety glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			assignment: Assign each student tasks of explaining how to carry out a risk assessment according to workshop standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	hazardous materials • Handle hazardous materials correctly • Prepare universal workshop colour codes and know what the colour represent • Make out and file safe report • Be aware of the dangerous of compressed air • Ensure availability of personal protective equipment • Supervise compressed air rules • Monitor good environmental practices • Clean tools and equipment • Store tools and equipment		hazardous materials • Handling hazardous materials **Theories:** The student should explain: • Carryout risk assessment • Conducting safety training • Inspecting workshop areas tools and equipment • Handling Hazardous materials correctly • Follow compressed air rules **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while carrying out risk management • Safe handling of tools and		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						equipment • Waste disposal		
		(c) Managing environmental pollution	**Internet and library search:** Guide the students in groups or individually to search on how to manage environmental pollution at a construction site **Field visit:** Organise the students in groups or the whole class to visit a building site to study how to manage environmental pollution at construction sites **Group discussion:** Guide the students to present their findings from field works and literature searches and discuss on how to manage environmental	**The student should be able to:** • Use water sprinklers to suppress dust • Cover construction materials during transport and storage • Use low-emission machinery and vehicles • Regularly maintain equipment to minimize exhaustion • Install barriers and enclosures to reduce dust spread • Install silt fences, sediment traps, and retention ponds • Stabilize soil with vegetation or geotextiles • Treat construction runoff before discharge • Prevent spillage of hazardous chemicals (e.g., concrete, oils) • Divert stormwater away from polluted areas • Segregate and recycle	Environmental pollution managed as per NEMC and OSHA standards and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Manage environmental pollution **Principles:** The student should explain the principles of: • Managing environmental pollution **Theories:** The student should explain: • Importance of a clean and safe environment • Causes of environmental pollution • Dangers of pollution to the environmental and living things	The following tools, equipment, and safety gear are to be available: • Service manuals • NEMC rules and regulations • Computer • Audio visual presentations • OSHA rules and regulations • Workshop rules and regulations • Camera • Risk assessment sheet • Mask • Earplugs • Gloves • Overalls • Safety boots • Clear safety glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			pollution at a construction site **Individual assignment:** Assign each student the task of explaining how to manage environmental pollution according to OSHA standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	construction debris (e.g., concrete, wood, metal) • Use designated areas for waste disposal • Store hazardous materials (e.g., fuels, paints) in secure, leak-proof containers • Use noise-reducing equipment and install sound barriers • Limit construction activities to designated working hours • Comply with OSHA regulations and guidelines • Train workers on pollution prevention practices • Address concerns related to pollution promptly • Incorporate eco-friendly materials and methods • Implement green building techniques (e.g., LEED certification)		• Importance of managing environmental pollution **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while carrying out risk management • Safe handling of tools and equipment • Waste disposal		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
	4.4. Carrying out Administrative Tasks at Site	(a) Identifying Site meetings and procedures	**Internet and library search:** Guide the students in groups or individually to search on how to document site meetings at a construction site **Field visit:** Organise the students in groups or the whole class to visit a building site to study how to document site meetings at construction sites **Group discussion:** Guide the students to present their findings from field works and literature searches and discuss on how to document site meetings at a construction site **Individual assignment:** Assign each	**The student should be able to:** • Write report on work progress • Check on the work progress • Write minutes of site meetings • Study the site organisation chart • Study the responsibilities of each staff	Documented site meetings and procedures conforming to standard requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to participate in site meetings at construction sites according to building regulations **Principles:** The student should explain principles of: • Functions of clerk of works • Building team formation and responsibilities • Contract formation • Dispute settlement processes • Modes of site operations **Theories:** The student should explain: • Functions of clerk of works	The following tools, equipment, and safety gear are to be available: • Office room • Contract documents • Specifications or Bill of Quantities (BoQ) • Schedule of rates • Visitors book • SMM • Schedule of Conditions • Daily Report Book. • Computer • Scientific calculators • Site meeting logbook • Materials supply log book • Plants and Equipment log book • Vehicles log book • Detailed Schedule of work • Drawing equipment • Printing facilities • Safety boots • Fire extinguishers	21

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			student the task of identifying site meetings and procedures according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			• Responsibility and duty outlines of building-team member • Record keeping **Circumstantial knowledge** **Detailed knowledge about:** • Firefighting strategies • Health and Safety requirements • Project impact on environmental • Air and Water or Chemical pollution risks	• Rulers • Drawing pens	
		(b) Preparing performance time table and schedules	**Internet and library search:** Guide the students in groups or individually to search on how to prepare performance time table and schedules at a construction site	**The student should be able to:** • Study the site organisation chart • Study the responsibilities of each staff • Plan the office responsibilities • Keep a record of office documents tools and equipment	The service performed according to the accepted contract specification and civil engineering work standards	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to participate in the supervision of site works and construction according to	The following tools, equipment, and safety gear are to be available: • Office room • Contract documents • Specifications or Bill of Quantities (BoQ) • Schedule of rates • Visitors book • SMM	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			Field visit: Organise the students in groups or the whole class to visit a building site to study how prepare performance time table and schedules at construction sites **Group discussion:** Guide the students to present their findings from field works and literature searches and discuss on how to prepare performance time table and schedules at a construction site **Group assignment:** Assign the students the task of preparing performance timetables and schedules according to	• Prepare the daily work routines • Administer daily clerical works • Check on all the plants and equipment • Prepare various schedules • Register project plants • Register project vehicles • Register project Materials • Pay office bills. • Pay office costs • Register project Assets		building regulations **Principles:** The student should explain principles related to: • Organisation of management skills • Site Insurance approaches • Functions of clerk of works • Building team formation and responsibilities • Contract formation • Dispute settlement processes • Modes of site operations • Writing Certifications and commissioning • Administering work Schedules **Theories:** The student should explain:	• Schedule of Conditions • Daily Report Book • Computer • Scientific calculators Site meeting logbook • Materials supply log book • Plants and Equipment log book • Vehicles log book • Detailed Schedule of work • Drawing equipment • Printing facilities • Safety boots • Fire extinguishers • Rulers • Drawing pens	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			• Functions of clerk of works • Formation of contract • Forms of insurances • Schedules of conditions to contracts • Forms of contracts • Site inspection regulations • Responsibility and duty outlines of building-team member • Record keeping • Working schedules **Circumstantial knowledge** **Detailed knowledge about:** • Firefighting strategies • Health and Safety requirements • Project mpact on Environmental		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Air and water or chemical pollution risks		
		(c) Preparing performance reports	**Internet and library search:** Guide the students in groups or individually to search on how to prepare performance report at a construction site **Field visit:** Organise students in groups or the whole class to visit a building site to study how prepare performance report at construction sites **Group discussion:** Guide the students to present their findings from field works and literature searches and discuss on how to prepare	**The student should be able to:** • Assess work stages. • Communicate with engineers and architect.	Performance reports prepared according to construction works standard requirements.	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain methods of assessing construction works preparing performance reports according to building regulations **Principles:** The student should explain principles related to: • Functions of clerk of works • Building team formation and responsibilities • Writing Certifications and commissioning **Theories:** The student should explain: • Functions of	The following tools, equipment, and safety gear are to be available: • Office room • Contract documents • Specifications or Bill of Quantities (BoQ) • Schedule of rates • Visitors book • SMM • Schedule of Conditions • Daily Report Book • Computer • Scientific calculators • Site meeting logbook • Materials supply log book • Plants and Equipment log book • Vehicles log book • Detailed Schedule of work • Drawing equipment	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			performance report at a construction site **Group assignment:** Assign the students the task of preparing a performance report according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			clerk of works • Formation of Contract • Forms of insurances • Schedules of conditions to contracts • Responsibility and duty outlines of building-team member • Record keeping • Working schedules **Circumstantial knowledge** **Detailed knowledge about:** • Firefighting strategies • Health and safety requirements • Project Impact on Environmental • Air and water or chemical pollution risks	• Printing facilities • Safety boots • Fire extinguishers • Rulers • Drawing pens	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
5. Managing Preventive Maintenance	5.1. Planning Preventive Maintenance	(a) Identifying types of building maintenance, tools, and equipment	**Question and answer:** Use questions and answers to guide the students to explain types of building maintenance, tools and equipment **Internet and library search:** Guide the students in groups or individually to search on types of building maintenance, tools and equipment **Group discussion:** Guide the students to present their findings from literature searches and discuss on types of building maintenance, tools and equipment **Group assignment:** Assign the students the task of identifying various	**The student should be able to:** • Interpret service manuals • Rank maintenance tasks by importance • Document and track maintenance • Review and adjust the plan • Identify all systems, equipment, and areas that require maintenance • Prepare building inspection report • Prepare preventive maintenance programmes • Prepare preventive maintenance schedule • Plan and prepare the building inventory • Clean tools and equipment • Store tools and equipment	Preventive maintenance is planned as per construction standards	**Knowledge evidence:** **Detailed knowledge of**: **Method used:** The student should explain how to: • Identify types of building maintenance, tools, and equipment **Principles:** The student should explain the principles related to: • Identification of types of maintenance, tools and equipment **Theories:** The student should explain: • Types of maintenance • Define types of maintenance (Preventive Maintenance, Corrective	The following tools, equipment, and safety gear are to be available: • Computerized Maintenance Management System (CMMS) • Maintenance Checklists • Calendars and Scheduling Software • Asset Management Software • Inventory Management Tools • Mobile Devices or Tablets • Maintenance Logbooks or Databases • Diagnostic Tools • Spare Parts Inventory • Project Management Software • General hand foot kit • Workshop tools, equipment and machines • Service manuals • Workshop rules	45

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			types of building maintenance tools and equipment according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic			Maintenance, Predictive Maintenance, Routine Maintenance, Emergency Maintenance) • Importance of interpreting service manuals • Importance of building maintenance • Importance of preparing building inspection and maintenance schedule reports • Importance of preparing maintenance training programs • Importance of Cleaning and storing tools and equipment **Circumstantial knowledge** **Detailed knowledge about:**	and regulations • Gloves • Overalls • Safety boots • Clar safety glasses • Helmet • Mask • Earplugs	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						• Safety precautions while planning preventive maintenance • Safe handling of tools and equipment		
		(b) Preparing inspection check list of building components, tools, and equipment	**Internet and library search:** Guide the students in groups or individually to search on preparing inspection check list of building components, tools and equipment **Group discussion:** Guide the students to present their findings from literature searches and discuss on preparing inspection check list of building components, tools, and equipment **Group assignment:** Assign the students	**The student should be able to:** • Interpret service manuals • Select tools and equipment • List all major building components (e.g. roof, foundation) • Determine what to inspect for each component (e.g., wear and tear, safety). • Set how often each component should be inspected (e.g. monthly) • Break down specific tasks and items to be inspected for each building component • Identify high-priority or safety-critical components that need	Inspection check list of building components, tools, and equipment is prepared as per construction standards	**Knowledge evidence:** **Detailed knowledge of**: **Method used:** The student should explain how to prepare building and equipment inspection check list **Principles:** The student should explain the principles related to: • Preparing inspection check list of building components, tools and equipment **Theories:** The	The following tools, equipment, and safety gear are to be available: • Computer or Tablet • Spreadsheet Software (e.g., Excel, Google Sheets) • Checklist Template or Software (e.g., CMMS) • Notepad or Mobile App for Notes • Pen or Marker • Clipboard • General hand foot kit • Workshop tools, equipment and machines • Service manuals • Workshop rules and regulations • Gloves • Overalls • Safety boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			the task of preparing an inspection checklist for building components, tools, and equipment according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	more frequent or detailed inspections (e.g. fire alarms, structural integrity) • Ensure the checklist includes items required by OSHA • Include spaces for notes, dates of inspection, and any corrective actions or follow-ups on the paper page • Determine any tools or instruments needed for the inspection (e.g., moisture meters, thermometers, ladders). • Plan how to record and report inspection findings, including whether follow-up actions are needed. • Review the checklist periodically to update based on changes to the building, new regulations etc • Clean tools and equipment • Store tools and		student should explain: • Building defects • Types of defects in buildings • Causes of building defects • Building inspection. • Conditional survey • Importance of building inspection **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while planning preventive maintenance • Safe handling of tools and equipment	• Clear safety glasses • Helmet • Mask • Earplugs	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				equipment				
	5.2. Supervising Preventive Maintenance	(a) Performing preventive maintenance of buildings components, tools, and equipment	**Internet and library search:** Guide the students in groups or individually to search on performing preventive maintenance of buildings components, tools, and equipment **Field visit:** Organise the students in groups or the whole class to visit a building the estate department of the school or any nearby institution to study how to perform preventive maintenance of buildings components, tools, and equipment **Group discussion:** Guide the students	**The student should be able to:** • Interpret service manuals • Verify whether the scheduled tasks and components to be inspected align with the plan • Gather all necessary tools and materials for the maintenance tasks (e.g., cleaning supplies, replacement parts) • Conduct thorough visual inspections of the roof, foundation, plumbing, electrical, HVAC, and other systems • Clean air filters, ducts, drains, and other systems that require regular maintenance • Look for signs of damage, rust, leaks, or other wear in building components like doors, windows, and electrical systems	Preventive maintenance of building components, tools, and equipment is performed as per regulations	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: • Perform preventive maintenance of building components, tools and equipment **Principles:** The student should explain the principles related to: • Performing preventive maintenance **Theories:** The student should explain: • Importance of preventive maintenance • Performing preventive	The following tools, equipment, and safety gear are to be available: • General hand foot kit • Workshop tools, equipment, and machines • Service manuals • Workshop rules and regulations • Gloves • Overalls • Safety boots • Clear safety glasses • Helmet • Mask • Earplugs	45

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
			to present their findings from field works and literature searches and discuss on how to perform preventive maintenance of buildings components, tools, and equipment **Group assignment:** Assign the students the task of performing preventive maintenance on building components, tools, and equipment according to technical work standards **Feedback:** Provide feedback to students on their tasks and introduce the next topic	• Ensure all systems (HVAC, lighting, plumbing) are operating correctly • Replace filters, light bulbs, batteries, or worn-out components • Perform minor repairs as needed • Check for compliance with fire safety regulations, electrical codes, and other relevant building standards • Log completed tasks, repairs made, and parts replaced in the maintenance record for future reference • Clean tools and equipment • Store tools and equipment properly		maintenance of various building components, tools and equipment **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing preventive maintenance • Safe handling of tools and equipment		
		(b) Performing preventive maintenance of	**Question and answer:** Use questions and	**The student should be able to:** • Interpret service	Preventive maintenance of workshop and	**Knowledge evidence:** **Detailed**	The following tools, equipment, and safety gear are to be available:	

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				Process Assessment	Services Assessment	Knowledge Assessment		
		working environment	answers to guide the students to explain how to perform preventive maintenance of working environment **Demonstration:** Demonstrate to students on how to perform preventive maintenance of workshop working environment **Activity:** Guide the students in groups to perform preventive maintenance of workshop working environment **Feedback:** Provide feedback to students on their tasks and introduce the next topic	manuals • Read and apply rules and regulations • Review the layout and components of the workshop (e.g. tools) • Collect the necessary tools e.g. cleaning supplies and PPE for maintenance tasks. • Check workstations for cleanliness, damage, and safety hazards (e.g., sharp edges, worn-out equipment). • Clean and service machinery, power tools • Inspect electrical outlets for proper grounding and functionality. • Check cords and circuit breakers to ensure there are no exposed wires. • Clean air filters and remove any blockages from vents or fans. • Check fire extinguishers, first	working environment is performed as per workshop standards.	**knowledge of:** **Method used:** The student should explain how to: • Prepare and apply workshop preventive schedule • Plan and conduct preventive maintenance training • Prepare safety signs and colour code • Correct hand tools and equipment safety • Good electrical safety • Follow good environmental practices **Principles:** The student should explain the principles of: • Preventive maintenance schedule	• General hand foot kit • Workshop tools, equipment, and machines • Service manuals • Workshop rules and regulations • Gloves • Overalls • Safety boots • Clear safety glasses • Helmet • Mask • Earplugs	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
				aid kits, and emergency exits to ensure their accessibility and condition. • Clean and repair floors and surfaces as needed. • Test lights, replace burned-out bulbs • Ensure adequate lighting for all work areas. • Handle waste in accordance with OSHA. • Regularly update the maintenance schedule based on workshop needs. • Practice correct hand tools and equipment safety • Clean tools and equipment • Store tools and equipment		• Preparing and use safety signs and colour code • Plan and conduct preventive maintenance training • Preparing and applying **Theories:** The student should explain: • Importance of preparing and applying preventive maintenance schedule • Importance of preparing and use safety signs and colour code • Importance of planning and conducting preventive maintenance training • Importance of follow good environmental		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Services Assessment	Knowledge Assessment		
						practices **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while planning preventive maintenance • Safe handling of tools and equipment • Waste disposal		

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