

***Construction Site
Management***

COURSES	
<p style="text-align: center;">Erecting Concrete Structures</p>	<p>OUTCOMES</p>
	<ol style="list-style-type: none"> 1. explain the properties of concrete. 2. differentiate various types of cement. 3. demonstrate various tests to analyze the strength of concrete. 4. examine the importance of aggregates during the preparation of concrete. 5. construct small concrete structures such as block walls, driveways, and law tiles.
<p style="text-align: center;">UNIT I -ANALYSING THE PROPERTIES OF CONCRETE</p>	<ol style="list-style-type: none"> 1. evaluate the properties of cement. 2. discuss the properties and composition of various types of cement and their use in the concrete industry. 3. justify the use of various types of aggregates during the production of cement. 4. demonstrates the aggregate quantities typically used in concrete. 5. define the term “cementitious materials”.

	<ol style="list-style-type: none"> 6. calculate water/cementitious materials ratios. 7. assess the effects of admixtures on the properties of concrete. 8. explain how the dose of lithium admixture is calculated to control alkali-silica reactions. 9. demonstrate the proper sequencing of admixtures. 10. assess the effects of fly ash, blast furnace slag, silica fume, and metakaolin on the properties of concrete. 11. justify the effects of cement fineness on water demand and concrete strength properties. 12. recognize the importance of controlling the heat of hydration in concrete. 13. discuss precautions that should be taken when interfacing with dry and wet concrete. 14. use various techniques for preparing different types of concrete. 15. use the correct water-to-cement ratio to prepare various types of concrete. 16. use the correct aggregate ratio to prepare various types of concrete.
<p style="text-align: center;">UNIT II - EVALUATING THE STANDARDS AND QUALITY FOR CONCRETE</p>	<ol style="list-style-type: none"> 1. describe the difference between a code and a specification. 2. assess the requirements for the strength of concrete. 3. explain the process of ordering ready-mixed concrete. 4. assess the requirements for concrete production facilities.

	<ol style="list-style-type: none"> 5. summarize the requirements for the delivery of ready-mixed concrete. 6. analyze techniques used in the acceptance testing of ready-mixed concrete. 7. utilize various specimens for standard testing procedures. 8. analyze, and interpret data to make recommendations regarding the selection and use of materials for various applications.
<p style="text-align: center;">UNIT III - PREPARING FOR BRICK/BLOCK LAYING</p>	<ol style="list-style-type: none"> 1. recognize hazards associated with the use of bricklaying and block laying tools, plants and equipment. 2. use various manual handling techniques when brick and block laying. 3. calculate the material requirements from drawings. 4. demonstrate techniques for bricklaying and block-laying tasks. 5. adhere to workplace and equipment safety requirements. 6. construct a straight block wall using appropriate mortar. 7. construct columns or pier using concrete blocks. 8. construct corner walling using concrete blocks. 9. construct cross-over walling using concrete blocks.
<p style="text-align: center;">UNIT IV - USING CONCRETE</p>	<ol style="list-style-type: none"> 1. construct a concrete walkway. 2. construct a driveway. 3. create lawn tiles used in the construction industry.

	<ol style="list-style-type: none">4. demonstrate the sequence for finishing concrete.5. demonstrate the sequence for curing concrete.6. carry out special finishes to concrete.7. carry out tilt slab construction.
<p style="text-align: center;">UNIT V - REINFORCING CONCRETE STRUCTURES</p>	<ol style="list-style-type: none">1. evaluate reasons for using reinforcement in concrete structures.2. demonstrates proper placement of reinforcement in concrete structures.3. assess the importance of Prestressing and post-tensioning.4. explain SI (metric) sizes for reinforcement and strength grades of deformed steel bars.5. compare fiber-reinforced polymer (FRP) bars with steel bars.6. demonstrates the proper use of FRP bars.7. demonstrates the proper use of steel fibers in concrete.8. evaluates the effects of fibers on plastic and drying shrinkage cracking.9. demonstrates proper care and protection of coated and uncoated bars.

COURSES	
<p style="text-align: center;">Erecting Wooden Structures</p>	<p>OUTCOMES</p>
	<ol style="list-style-type: none"> 1. explain the properties of timber. 2. examine the use of various types of timber in the construction industry. 3. analyze typical structural systems for timber structures. 4. examine the Jamaican Building Codes on erecting timber structures. 5. explain various methods to test the strength of timber. 6. demonstrate various techniques to join timber within the construction industry. 7. demonstrate methods used as reinforcement in timber structures. 8. examine techniques used to preserve the life of timber. 9. construct various timber structures. 10. perform a timber frame fire risk assessment on a construction site.
<p style="text-align: center;">UNIT I -EVALUATING THE PROPERTIES OF TIME</p>	<ol style="list-style-type: none"> 1. justify the use of timber in the construction industry based on its mechanical properties. 2. justify the use of various types of timber in the construction industry. 3. value typical structural systems for timber structures.

	<ol style="list-style-type: none"> 4. evaluate methods of testing the structural integrity of timber. 5. assess the Jamaican Building Codes on erecting timber structures
UNIT II - PRESERVING TIMBER	<ol style="list-style-type: none"> 1. assess the problems that affect the longevity of timber in the construction industry. 2. apply the appropriate preservative treatments to increase the longevity of timber.
UNIT III - PROTECTING TIMBER FRAMES FROM FIRES	<ol style="list-style-type: none"> 1. perform a timber frame fire risk assessment on a construction site. 2. evaluate techniques used to eliminate the fire hazards associated with timber both in and out phase of the project. 3. assess methods to mitigate the fire risk associated with timber frames. 4. justify the relevance of the Jamaica Fire Codes as it relates to erecting timber structures.
UNIT IV - USING MATERIALS FOR PARTITION FRAMES	<ol style="list-style-type: none"> 1. differentiate between Wolmanized Pitch Pine and Pitch Pine. 2. analyze the different types of materials used as studs. 3. analyze the different types of materials used as a top plate and bottom plate. 4. determine the function of a staggered blocking board.

	<ol style="list-style-type: none"> 5. construct load-bearing walling. 6. construct non-load-bearing walling.
<p>UNIT V - APPLYING CLADDING TO WOODEN STRUCTURES</p>	<ol style="list-style-type: none"> 1. differentiate between various types of cladding. 2. analyze the various methods for installing cladding. 3. critique the various materials used for installation. 4. install sheetrock according to specifications. 5. install fiberrock according to specifications. 6. tape and plaster different types of cladding according to specifications. 7. prepare different types of cladding for painting according to specifications
<p>UNIT VI - CONSTRUCTING TIMBER FLOOR</p>	<ol style="list-style-type: none"> 1. differentiate between subfloors and suspended floors. 2. analyze the difference between the structural floor members. 3. construct a timber floor subfloor. 4. construct a suspended timber floor. 5. applying finishes to wooden structures.

COURSES	OUTCOMES
<p align="center">Practicing Occupational Health Safety Requirement</p>	<ol style="list-style-type: none"> 1. explain local and international Occupational Safety and Health regulations (OSH). 2. demonstrate safety procedures to prevent injury to self, clients and colleagues at the workplace. 3. use mechanical and electrical operations safely. 4. use tools and equipment safely. 5. conduct occupational health and safety drills. 6. use various types of fire extinguishers. 7. apply basic first aid and CPR. 8. Identify hazards and hazardous situations. 9. assess workplace and occupational risks.
<p align="center">UNIT I -ADHERING TO OHS REQUIREMENTS</p>	<ol style="list-style-type: none"> 1. explain the importance of health and safety at the workplace.

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| | <ol style="list-style-type: none">2. outline the history of health and safety at the workplace.3. research OHS requirements, laws and regulations as applicable to the construction industry.4. identify causes of accidents workers are exposed to at the workplace.5. identify types of hazards workers are exposed to at the workplace.6. outline procedures to prevent injury.7. write an accident report.8. demonstrate safety procedures that can prevent injury to self and colleagues.9. demonstrate safe work practices when using tools, equipment and materials/substances at work. |
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<p style="text-align: center;">UNIT II - FOLLOWING ELECTRICAL AND MECHANICAL EQUIPMENT SAFETY REQUIREMENTS</p>	<ol style="list-style-type: none"> 1. identify electrical equipment and electrical hazards. 2. identify mechanical equipment hazards. 3. use safety procedures with electrical equipment and electricity. 4. apply safe electrical practices and operation at work. 5. interpret electrical hazard safety signs correctly 6. demonstrate safe electrical installation of equipment, fixtures and appliances. 7. use First Aid to treat electrical shocks.
<p style="text-align: center;">UNIT III - HANDLING HAZARDOUS MATERIALS / SUBSTANCES</p>	<ol style="list-style-type: none"> 1. identify various hazardous materials /substances related to the job. 2. recognize various hazard signs and symbols used in the workplace. 3. describe the procedures for the proper handling and disposal of hazardous materials /substances. 4. investigate the impacts of hazardous materials and substances on the human and natural environment.
<p style="text-align: center;">UNIT IV - PRACTICING FIRE SAFETY AND HAZARDS MITIGATION</p>	<ol style="list-style-type: none"> 1. identify types of fire hazards common to the work environment.

	<ol style="list-style-type: none"> 2. demonstrate the correct type of fire extinguisher for the various situations. 3. describe the proper location of fire extinguishing equipment at the workplace. 4. demonstrate the correct procedures when extinguishing different types of fires at the workplace. 5. conduct a fire drill in a lab-setting. 6. write a fire drill report. 7. describe the safety procedures and precautions used to handle and store flammable materials. 8. explain the importance of an assembly point at the workplace.
<p style="text-align: center;">UNIT V - ADMINISTERING FIRST AID AND CPR</p>	<ol style="list-style-type: none"> 1. explain the importance of First Aid and CPR within the workplace. 2. outline the steps taken when an accident occurs. 3. apply the ABC Assessment for first aid. 4. identify items for First Aid kit and its location. 5. demonstrate how to treat cuts and bruises with first aid (demonstration/simulation). 6. demonstrate the application of first aid and CPR to injured colleagues (Simulation). 7. examine the role of having trained first-aider at the workplace.

	<p>8. take steps to acquire professional certification in First Aid and CPR.</p> <p>9. assess the role of the Government Agencies, Professional Bodies in OHS compliance.</p>
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COURSES	OUTCOMES
Preparing Sites And Carry Out Steel-Fixing	<p>1. describe the function of various professionals and trade persons in the construction industry.</p> <p>2. analyze soil types to determine the type of foundation suitable.</p>

	<p>3. demonstrate competencies in setting out a building, and excavation of foundation.</p> <p>4. differentiate among timbering to foundation trenches.</p> <p>5. demonstrate competencies in the construction and installation of steelwork</p>
<p>UNIT I -INTRODUCING THE CONSTRUCTION INDUSTRY</p>	<p>1. identify the various professionals and tradesmen on a building team.</p> <p>2. describe the function of the various professionals and trade persons in the construction industry.</p> <p>3. describe the overall construction projection process from conceptualization to implementation.</p>
<p>UNIT II - PREPARING THE CONSTRUCTION SITE</p>	<p>1. analyze factors affecting choice of site (accessibility, cost, topography etc.).</p> <p>2. differentiate types of hoarding.</p> <p>3. differentiate between stripping and site clearance of a site.</p> <p>4. examine various types of soils.</p> <p>5. evaluate types of soil tests.</p> <p>6. assess the processes involved in “setting out” of a building.</p> <p>7. conduct setting out of simple and irregular buildings on a construction site.</p> <p>8. examine various types of temporary structures.</p>

<p>UNIT III - CREATING FOUNDATION FOR STRUCTURES</p>	<ol style="list-style-type: none"> 1. explain the importance of a foundation. 2. evaluate the types of foundations and their uses. 3. assess factors affecting foundations.
<p>UNIT IV - INSTALLING MATTING, WALLS AND STIFFENERS</p>	<ol style="list-style-type: none"> 1. construct matting for foundation footing. 2. construct a foundation wall. 3. construct vertical wall bars. 4. construct stiffeners.

<p>COURSES</p>	
<p>Preparing Geometric Drawings And Sketches</p>	<p>OUTCOMES</p>
	<ol style="list-style-type: none"> 1. apply drafting techniques. 2. interpret simple drawings. 3. produce development of different objects.

	<p>4. construct auxiliary views.</p> <p>5. produce ellipses using different methods.</p> <p>6. construct isometric, oblique, axonometric drawings.</p> <p>7. produce an orthographic view.</p> <p>8. produce three dimensional sketches using perspective methods.</p>
UNIT I -APPLICATION OF DRAWING PRINCIPLE	<p>1. differentiate various types of lines and its usages.</p> <p>2. classify types of drawings and their purpose.</p> <p>3. identify drawing forms: units, formats, sheet sizes.</p> <p>4. apply various types of drawing routines.</p> <p>5. convert imperial to metric.</p> <p>6. applying various scales to drawings.</p>
UNIT II - GEOMETRIC DRAWINGS	<p>1. draw development views of both pyramids and prisms.</p> <p>2. create a model of development layouts.</p> <p>3. construct ellipses using different methods.</p> <p>4. draw auxiliary views.</p>
UNIT III - ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS	<p>1. produce drawings in isometric projection.</p> <p>2. draw oblique drawings.</p>

	<ol style="list-style-type: none"> 3. draw axonometric. 4. produce drawings in first angle projection. 5. produce drawings in third angle projection. 6. convert orthographic view into isometric projection. 7. produce sectional drawings.
UNIT IV - FREE HAND SKETCHES	<ol style="list-style-type: none"> 1. produce drawings using a single point perspective. 2. produce drawings using a two-point perspective.

COURSES	OUTCOMES
Using Drawing Technologies 1 (AUTOCAD)	<ol style="list-style-type: none"> 1. apply the concept of ergonomics around the workstation. 2. apply the concept of layering. 3. annotate drawing in AutoCAD. 4. apply repetitive symbols as block and block.

	<ol style="list-style-type: none"> 5. demonstrate how to inquire for data in a drawing. 6. prepare construction drawings using AutoCAD.
<p style="text-align: center;">UNIT I -RECOGNIZING ERGONOMICS & COMPUTER BASICS</p>	<ol style="list-style-type: none"> 1. describe ergonomic problems relating to computer workstations. 2. state precautions (electrical and mechanical) that should be observed when using computer equipment for CAD. 3. perform safety and ergonomics requirements for performing computer aided drawings. 4. identify the parts of the AutoCAD interface. 5. demonstrate the ability to set up a drawing environment. 6. demonstrate the ability to manipulate and manage computer files [Start a new drawing, open an existing drawing, save a drawing, restore a backup CAD file]. 7. explain the different types of coordinate methods. 8. use coordinate systems with basic commands.
<p style="text-align: center;">UNIT II - PERFORMING BASIC DRAWING & EDITING COMMANDS</p>	<ol style="list-style-type: none"> 1. produce simple line drawings. 2. draw shapes and geometries. 3. manipulate, edit and change drawings. 4. select objects for editing.

	5. view drawings produced
<p>UNIT III - EXECUTING ADVANCE DRAWING & EDITING IN AutoCAD</p>	<ol style="list-style-type: none"> 1. explain the concept of layering. 2. produce construction drawings efficiently and precisely. 3. create window and door openings. 4. insert symbols from Design Center and Tool Palette. 5. create and insert BLOCKS and WBLOCKS Windows. 6. explain the purpose of Text style. 7. create and use Text styles. 8. explain the use of dimension styles. 9. modify text & dimensions. 10. edit text. 11. edit dimensions. 12. edit dimension style. 13. use imperial versa metric dimensions.
<p>UNIT IV - PERFORMING ADVANCED EDITING TECHNIQUES IN AUTOCAD</p>	<ol style="list-style-type: none"> 1. edit dimension style. 2. use imperial versa metric dimensions. 3. load linetype. 4. scale linetype. 5. insert and scale hatch patterns.

	<ol style="list-style-type: none"> 6. insert Stiffener block. 7. add text and dimension to the foundation plan. 8. apply offset command sub options. 9. apply Line weight. 10. scale and insert Hatch. 11. insert Donut. 12. add text and dimension to detail at Plot scale. 13. create and insert Multileader Styles.
<p>UNIT V - PERFORMING ADVANCE DRAWING & EDITING COMMAND</p>	<ol style="list-style-type: none"> 1. copy walls from the foundation plan using layer state. 2. change linetype for walls from continuous to hidden. 3. insert and array rafters. 4. trim and mirror rafters. 5. create roof covering using hatch options. 6. create elevations from the floor plan. 7. insert windows and doors as WBLOCKS. 8. create a roof on the building. 9. insert landscaping symbol. 10. create Tablestyle at plot scale. 11. use advanced drawing & editing Commands. 12. draw Site plans.

	<ul style="list-style-type: none"> 13. apply the surveyor's unit angle. 14. create site boundaries. 15. apply linetype scale. 16. copy and insert building in-place. 17. add landscaping symbols. 18. create and insert text and dimstyle.
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COURSES	
Performing Construction Project Planning Techniques	OUTCOMES
	<ul style="list-style-type: none"> 1. develop project charter and scope project activities. 2. schedule and timeline project activities. 3. implement and monitor projects.

	<p>4. use project management software and tools.</p> <p>5. perform critical path analysis for construction projects.</p> <p>7. implement measures to avoid cost overruns for construction projects.</p> <p>8. implement a contingency plan for a construction project.</p> <p>9. Evaluate project management team.</p>
<p>UNIT I -- PREPARE PRE-PROJECT SETUP/INITIATION</p>	<p>1. define 'project management'.</p> <p>2. identify the characteristics of a project.</p> <p>3. interpret the requirements to complete a pre-project setup/initiation.</p> <p>4. apply the steps in validating a project.</p> <p>5. examine the contents of a project charter.</p> <p>6. develop a project charter.</p> <p>7. summarize the project life cycle.</p> <p>8. conduct feasibility arrays.</p> <p>9. align project to strategic plan.</p>
<p>UNIT II - APPLYING CONSTRUCTION MANAGEMENT TECHNIQUES</p>	<p>1. prepare a project scope document based on an approved project charter.</p> <p>2. use a Work Breakdown Structure (WBS) and WBS dictionary to organize project planning.</p>

	<ol style="list-style-type: none"> 3. outline a process for managing changes to the project. 4. develop a project schedule based on WBS, project scope and resource requirements. 5. create a project schedule using Project Management Software. 6. evaluate a desired deliverable, apply the appropriate tool and/or method to produce the appropriate outcome. 7. interpret the results of using project management tools and/or methods in a given scenario.
<p style="text-align: center;">UNIT III - LEAD PROJECT MANAGEMENT TEAM</p>	<ol style="list-style-type: none"> 1. evaluate different leadership styles. 2. demonstrate the characteristics of an effective project leader. 3. differentiate between leadership and motivation. 4. coordinate human resources to maximize project performance. 5. explain the importance of a project kick-off meeting. 6. conduct the project kick-off meeting. 7. explain the purpose and influence of organizational governance on a project's execution.

<p>UNIT IV - MANAGE PROJECTS</p>	<ol style="list-style-type: none">1. explain project management procedures.2. manage projects according to project plan, scope and time lines.3. implement change management procedures given a scenario.4. evaluate the impact of potential changes to triple constraint.5. Use risk management plan to determine appropriate response to potential risks or opportunity events.6. Execute appropriate resource leveling techniques.7. Apply the appropriate steps to ensure quality of project deliverables.8. Identify tools to use when a project deliverable is out of specifications.9. Manage and implement information distribution based on communication plans.
<p>UNIT V - CLOSE OUT PROJECT</p>	<ol style="list-style-type: none">1. differentiate the types of closure of Projects.2. explain the importance of and benefits of formal project closure.3. determine circumstances in which project closure may occur.4. implement the various closing tasks.5. identify the components and purpose of closing documentation.6. prepare closing documents.

	7. examine close out project procedures.
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COURSES	
Performing Site Surveying	OUTCOMES
	<ol style="list-style-type: none"> 1. demonstrate the correct use of various tools used for capturing measurements for survey documents according to international standards. 2. conduct chain surveying and leveling instruments. 3. apply theory and practical concept to produce graphical representation. 4. examine the relationship between measured values and calculated values and the degrees of accuracy for given practical assessments.
UNIT I -APPLYING BASIC SURVEY CONCEPTS	<ol style="list-style-type: none"> 1. define the term “surveying”. 2. appraise the types of surveys according to international surveys.

3. outline the classes of surveys that are performed on a construction site.
4. outline the uses of survey tools.
5. use surveys tools in field work according to international standards.
6. assess at least seven (7) applications of surveys in the construction industry.
7. compare historic and modern methods of surveying.
8. perform the principles of surveying according to international standards in field work exercises.
9. differentiate between the branches of surveying.
10. use the terms under survey references such as, grid reference, legal reference, vertical reference, geographic reference, accuracy and precision, location methods, unit of measure, accuracy ratio and distance measurement.
11. establish field notes and data and list rules for establishing such data.
12. establish preliminary planning of survey exercises.
13. establish boundaries, corners, and tie marks.
14. prepare for a reconnaissance survey.
15. prepare the data collection book for surveying exercise.
16. establish field notes and data.

	<ul style="list-style-type: none"> 17. list rules for establishing such data in the field. 18. examine the nature of geomatic instruments. 19. conduct angular measurement through location ties or with a compass.
<p>UNIT II - CONDUCTING DISTANCE MEASURING AND CHAIN SURVEY</p>	<ul style="list-style-type: none"> 1. outline equipment used in chain surveying and distance measuring. 2. assess the characteristics and use of tapes and chains. 3. inspect ways that tapes are marked or graduated. 4. use tapes chain surveying equipment according to international standards. 5. conduct a chain survey during field work according to international standards. 6. set out or set up measuring instruments over stations (plumbed with optical squares or plumb bob). 7. locate stations or targets accurately during a field exercise. 8. set and reset geomatic instrument positions to read horizontal face right and left. 9. apply appropriate tools to measure distances accurately. 10. observe surveying error after a field exercise. 11. practice to “book information” for chain surveying field work
<p>UNIT III - CONDUCTING A LEVELING SURVEY</p>	<ul style="list-style-type: none"> 1. define the term “levelling”.

	<ol style="list-style-type: none"> 2. outline the characteristics and uses of a level, theodolite and total station. 3. illustrate the components of a level and a tripod. 4. operate a level, staff and a tripod according to international standards. 5. conduct a levelling survey to include reading various types of “staff” markings. 6. demonstrate the procedures to “book information” from levelling field work. 7. create a field book with notes from surveying activities at various locations. 8. calculate the absolute values of a levelling exercise.
<p style="text-align: center;">UNIT IV - PERFORMING VOLUME AND AREA COMPUTATION</p>	<ol style="list-style-type: none"> 1. compare the terms “ cross-section” and “profile”. 2. sketch the cross-sectional arrangement for a cut and fill section for a road. 3. calculate volume using the prismatic formula/end areas. 4. calculate areas trapezoidal technique/Simpson’s 1/3 rule. 5. sketch a topographical area for a section to be filled for road construction
<p style="text-align: center;">UNIT V - CONDUCTING TRAVERSING</p>	<ol style="list-style-type: none"> 1. define the term “traverse”. 2. assess the types of traverses used in surveying. 3. state the definition of critical components of traversing. 4. sketch diagram to show reverse bearings. 5. establish a right angle using a double right angle prism (optical square).

	<p>6. layout corners using a double right angle prism (optical square).</p> <p>7. establish north using a compass.</p> <p>8. calculate magnetic declination from various surveys.</p> <p>9. calculate azimuth data with the use of a sketch.</p> <p>10. explain the term deflection angles.</p> <p>11. justify an azimuth computation from the south east quadrant with the use of a diagram (or any other quadrant).</p> <p>12. apply calculations for bearing and azimuth checks in case scenarios with presented information or using the textbook in a clockwise and anticlockwise direction.</p> <p>13. perform a bearing computation for a closed traverse/open traverse.</p>
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COURSES	
Erecting Roof Structures	OUTCOMES
	<p>1. construct roof structures according to international standards.</p>

	<p>2. applying mathematical principles and concepts to determine the pitch and run of various roof structures.</p> <p>3. explain the importance of insulation and ventilation for various roof structures.</p> <p>4. apply appropriate finishes to roofs according to building code regulations.</p>
<p>UNIT I -CREATING ROOF STRUCTURES</p>	<p>1. differentiate types of timber roof structures.</p> <p>2. point-out the important features of each type of roof.</p> <p>3. examine the characteristics of three (3) categories of single roofs.</p> <p>4. creating models of single, double, trussed roof and trussed rafter roof according to building code regulations.</p>
<p>UNIT II - APPLYING MATHEMATICAL CALCULATIONS TO ROOF STRUCTURES</p>	<p>1. define the following terms “roof span, “roof height or rise” and “roof pitch.</p> <p>2. calculate the pitch and angle of a roof structure using the rise and span.</p> <p>3. explain the term “bevel”.</p> <p>4. calculate the length of the bevel of a common rafter according to building code regulations.</p>

	<ol style="list-style-type: none"> 5. construct the verge of a gable roof using the ladder frame, barge board, soffit, fascia. 6. define the term “eave”. 7. outline characteristics of flush, boxed/closed eaves. 8. construct the eave of a gable roof using various approaches according to building code regulations. 9. create various ways of ventilation for roof structures.
<p style="text-align: center;">UNIT III - APPLYING INSULATION AND FINISHES TO ROOF STRUCTURES</p>	<ol style="list-style-type: none"> 1. assess characteristics of warm and cold roof structures. 2. use appropriate materials to construct a warm and cold roof structures. 3. provide at least ten (10) the properties of Ballytherm Polyisocyanurate insulation. 4. apply at least three (3) types of roofing finishes to roof structures.

COURSES	
Practicing National Building Codes and Regulations	OUTCOMES

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| | <ol style="list-style-type: none">1. explain the functions and responsibilities of public consultation on planning matters.2. analyze legislative framework for town and country planning for a local area.3. examine relationships between the planning policy and the infrastructure as required.4. examine the process involved in approving building applications by the Local Building authorities.5. explain the role of the Building Inspector.6. outline role of the Commission of Strata Corporations as it relates to the development and maintenance of multi-dwelling complexes. |
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UNIT I -GENERAL PUBLIC HEALTH
AND SAFETY REQUIREMENTS

1. examine the characteristics of commercial and industrial buildings.
2. analyze various building groups, types, classification by construction.
3. assess fire resistance rating for building special provisions.
4. determine occupancy content of a building
5. analyze areas of escape for various building designs according to the building code regulation
6. examine features and design of an automatic sprinkler system used to mitigate fires
7. outline fire resistance rating for materials.
8. outline the role of the local entities as it relates to the development and maintenance of multi dwelling complexes.
9. examine checklist used by the National Environment and Planning Agency when initiating
new construction projects
10. contrast the terms “building regulations” and “building codes” and indicate their relevance
to the development and sustainability of the construction industry
11. examine inspector’s checklist that builders/ developers should adhere to in order to get
approval for construction

12. explain requirements for key features of a building according to the National Building Code.

<p style="text-align: center;">UNIT II - STRUCTURAL REQUIREMENT</p>	<ol style="list-style-type: none"> 1. identify the various types of dead and live loads within a building 2. analyze how dead and live loads may impact the structural integrity of a building 3. examine advantages and disadvantages of various foundation types used in construction 4. explain how soil investigation can determine the choice of foundation. 5. examine international tests used to determine the quality and strength of blocks used for masonry construction. 6. explain importance of reinforce concrete and structural steel used in the construction industry 7. construction industry 8. examine standards for materials used in the construction industry
<p style="text-align: center;">UNIT III - SERVICES REQUIREMENTS</p>	<ol style="list-style-type: none"> 1. examine the processing of electrical, magnetic, and optical materials used in the construction. 2. explain applications and specifications for HVAC systems.
<p style="text-align: center;">UNIT IV - SOUND INSULATION</p>	<ol style="list-style-type: none"> 1. differentiate between sound and noise. 2. identify various ways in which sound is detected and measured.

	<ol style="list-style-type: none">3. state unit of sound absorption.4. evaluate which materials are best suited for sound barriers according to international standards.5. identify ways in which sound can be controlled within various buildings/structures.6. sketch an annotated diagram depicting how materials and acoustics elements are formulated to capture sound.7. outline required Decibels and Sabin for noise according to building code regulations.
<p>UNIT V - ADHERING TO REAL ESTATE REQUIREMENTS</p>	<ol style="list-style-type: none">1. define the terms “personal property”, “real property”, “title”, “possession” and “adverse possession”.2. distinguish between “ownership” and “possession”.3. examine the characteristics of various types of titles existing within the real estate sector.4. assess the various rights existing within the real estate sector.5. define the term “easement”.

	<p>6. propose the essential components of an easement.</p> <p>7. justify the process of creating an easement.</p> <p>8. apply land law in case scenarios.</p>
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COURSES	OUTCOMES
Determining Bill of Quantity for Substructures	<p>1. distinguish documents forming the bills of quantity for the various areas of construction work.</p> <p>2. provide a basis for the valuation of variations which often occur during the progress of the work.</p> <p>3. assist contractors in ordering materials and assessing the labour requirements for the contract.</p> <p>4. provide a good basis for a cost analysis, which can be used on future contracts in cost planning work.</p>

	<p>5. prepare a bill of quantity.</p>
<p>UNIT I -INTRODUCTION TO QUANTITY SURVEY</p>	<ol style="list-style-type: none"> 1. differentiate between an estimate and guesstimate. 2. explain the basic skills that an estimator must possess. 3. explain basic calculation on the different types of estimating. 4. explain how errors can occur during estimating. 5. explain four purposes for the bill of quantity. 6. identify the various documents within a bill of quantity. 7. list the processes involved in preparing a bill of quantity. 8. use measurement procedure in tabulating the dimension sheet. 9. apply rules that govern the dimension sheet. 10. state the general rules when taking off. 11. list the sequence of taking off for a substructure of a building. 12. explain use of the Standard Method of Measurement of Building works
<p>UNIT II - CALCULATE FOR SITE CLEARANCE AND EXCAVATION</p>	<ol style="list-style-type: none"> 1. define the terms “mean girth”,” set back or recess”. 2. compute the excavation to reduce level in substructure. 3. determine the mean girth of a rectangular building. 4. estimate the mean girth of irregular buildings. 5. evaluate the excavation in foundation trenches.

<p>UNIT III - CALCULATE EARTHWORK, HARCORE AND CONCRETE</p>	<ol style="list-style-type: none"> 1. calculate the quantity of backfill for a construction project. 2. compute the level and compact bottom of foundation trenches. 3. determine hardcore under concrete bed. 4. calculate concrete bed under floor slab. 5. calculate concrete in foundation footing.
<p>UNIT IV - CALCULATE EARTHWORK AND REINFORCEMENT IN SUBSTRUCTURE</p>	<ol style="list-style-type: none"> 1. calculate adjustment to soil disposal. 2. explain the taking-off process in substructure for steel work. 3. calculate blockwork. 4. calculate steelwork. 5. calculate formwork.
<p>UNIT V - PREPARE BILL OF QUANTITIES AND BILL SHEETS</p>	<ol style="list-style-type: none"> 1. explain the use of prime cost, provisional sum and contingency sum. 2. transfer data to an abstract sheet. 3. compute information in standard format on the abstract sheet. 4. complete costing using unit rates. 5. transfer data to the bill sheet.

COURSES	OUTCOMES
Apply Building Finishes	<ol style="list-style-type: none">1. discuss different types of building finishes2. outline the processes and procedures involved in the application of building finishes3. demonstrate understanding of the use of materials utilized for building finishes4. demonstrate an understanding of the tools and equipment used for building finishes5. apply building finishes to erected structures6. demonstrate the difference in application of building finishes to timber construction, etc.7. assess the application of building finishes

	<p>8. evaluate building finishes work completed</p>
<p>UNIT I -INTRODUCTION TO BUILDING FINISHES</p>	<ol style="list-style-type: none"> 1. discuss the term 'building' finish 2. outline the importance of building finishes to different parts of a structure 3. state general safety precautions for the application of building finishes 4. describe the criteria for the selection of building finishes for different structures 5. explain the procedures to undertake before the planning and organization of the application of a building finish 6. differentiate between different types of building finishes 7. state the advantages of building finishes 8. explain the durability of specified building finishes
<p>UNIT II - APPLYING FLOOR FINISHES TO STRUCTURES</p>	<ol style="list-style-type: none"> 1. discuss the term 'floor finish' 2. explain the classification of floors 3. outline five (5) basic categories of floor finish ingredients 4. explain the ingredients in a floor finish 5. discuss the purpose of the ingredients in floor finishes 6. calculate the amount of flooring required based on the specified floor area

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| | <ol style="list-style-type: none">7. prepare material and other requisition listings based on the project specifications8. select appropriate PPE to be used throughout the project9. demonstrate the ability to do surface preparation for effective application of floor finishes10. illustrate the installation process for a specified floor finish11. demonstrate the ability to apply a specified floor finish to an erected structure12. apply specified floor finish to a structure13. carryout waterproofing inspections and applications as required14. perform cleanup and safety checks of completed floor finish tasks |
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UNIT III - APPLYING WALL
FINISHES TO STRUCTURES

1. explain the term 'wall finish'
2. discuss the purpose of wall finishes
3. differentiate between interior and exterior wall finishes
4. state at least three (3) factors that affect the selection of wall finishes
5. outline two (2) categories of wall finishes
6. explain at least six (6) types of wall finishes
7. discuss the difference between 'wet' and 'dry' finishes
8. describe at least three (3) types of 'self-finish' for walls
9. state the life expectancy for at least three (3) types of 'self-finish' for walls
10. outline at least three (3) types of 'applied finish' wall finishes
11. state the life expectancy for at least three (3) types of 'applied finish' wall finishes
12. calculate the amount of material required based on the specified work area
13. prepare material and other requisition listings based on the project specifications
14. select appropriate PPE to be used throughout the project
15. demonstrate the ability to prepare the wall surface for finishes
16. select appropriate materials and equipment to be used for wall finish applications

17. illustrate the sequence of wall finishing operations for a specified wall finish

18. demonstrate the ability to carry out wall finishes operations using a specified finish

19. apply specified wall finishes to a structure

20. carryout waterproofing inspections and applications as required

21. perform cleanup and safety checks of completed tasks

UNIT IV - APPLYING CEILING
FINISHES TO STRUCTURES

1. define the term 'ceiling finish'
2. state the types of ceiling finishes
3. discuss the criteria for the selection of ceiling finishes
4. state the life expectancy for at least three (3) types of ceiling finishes
5. calculate the amount of material required based on the specified work area
6. prepare material and other requisition listings based on the project specifications
7. select appropriate PPE to be used throughout the project
8. demonstrate the ability to prepare the surface for finishes
9. select appropriate materials and equipment to be used for ceiling finish applications
10. illustrate the sequence of finishing operations according to job specification
12. demonstrate the ability to carry out ceiling finishes operations using a specified finish
13. apply specified roof ceiling finish to a structure
14. carryout waterproofing inspections and applications as required
15. perform cleanup and safety checks of completed tasks

<p style="text-align: center;">UNIT V - APPLYING ROOF FINISHES</p>	<ol style="list-style-type: none">1. define the term 'roof finish'2. different between various types of roof finishes3. discuss the criteria for the selection of roof covering materials4. calculate the amount of material required according to specifications5. prepare material and other requisition listings based on the project specifications6. select appropriate PPE to be used throughout the project7. demonstrate the ability to prepare the roof surface for finishes according to specifications8. select appropriate materials and equipment to be used for roof finish applications9. outline the sequence of finishing operations according to job specification10. demonstrate the ability to carry out roof finishes operations using a specified finish11. apply specified roof finishes to a structure12. carry out waterproofing inspections and applications as required13. perform cleanup and safety checks of completed tasks

COURSES	
Applying the Principles of Physics and Chemistry to Construction	OUTCOMES
	1. explain the physical and chemical properties of building materials 2. differentiate between angular and linear velocity

	<p>3. calculate force, speed, velocity, efficiency, momentum, work power, energy, and friction</p> <p>4. differentiate between hydrostatic and hydrodynamic</p> <p>5. calculate relating to hydrodynamic situations (floatation, Archimedean Principle, etc.)</p> <p>6. determine how building materials behave when used in construction</p> <p>7. demonstrate an understanding of types of forces on structural members</p> <p>8. understand the importance of center of gravity to structures</p> <p>9. apply the principles of physics and chemistry to predict the performance of structures in construction</p>
<p>UNIT I -APPLYING THE PRINCIPLES OF PHYSICS - STATICS AND DYNAMICS</p>	<p>1. . differentiate between static and dynamics</p> <p>2. . distinguish between linear and angular motions</p> <p>3. differentiate between work, energy, and power</p> <p>4. . calculate work done</p> <p>5. . solve energy related problems</p> <p>6. . determine power used to carry out a construction related task</p> <p>7. . explain the relationship between work, power, and energy</p> <p>8. state the difference between friction, speed, and velocity</p>

	<ul style="list-style-type: none"> 9. . determine the velocity ratio of a simple machine used in construction 10.calculate the efficiency of a machine used in construction 11.. state the law of conservation of linear momentum, applicable to construction 12.explain the application of Newton’s Law to construction 13.. differentiate between linear dynamics and rotational dynamics 14.. analyze bodies in linear motion 15.. calculate frictional force 16.. use newton’s laws to solve problems in building 17.analyze bodies in angular motions
<p>UNIT II - APPLYING THE PRINCIPLES OF PHYSICS TO FORCES AND MOMENTS FOR STRUCTURES</p>	<ul style="list-style-type: none"> 1. understand the fundamental units in physics along with their corresponding SI units 2. define the term force 3. state the SI unit for force 4. evaluate the effects of various types of forces on a structure 5. differentiate between concurrent and non-concurrent forces 6. apply the polygon principle to determine the resultant force acting on a structure 7. calculate the magnitude and direction of a resultant force acting on a structure

	<ol style="list-style-type: none"> 8. calculate tensions in loaded system 9. apply Lami's Theorem to for systems 10. state the principle of moments 11. explain the conditions of equilibrium of a body under the influence of a system of parallel forces 12. use the principles of moments to calculate the reactions of a simple loaded beam 13. differentiate between concentrated and distributed loads 14. apply the principles of physics to calculate uniform distributed loads 15. assess the relevance of the principles of moments to construction 16. evaluate the significance of center of gravity for structures in construction
<p style="text-align: center;">UNIT III - APPLYING THE PRINCIPLES OF PHYSICS – HYDROSTATICS AND HYDRODYNAMICS</p>	<ol style="list-style-type: none"> 1. identify the major properties of fluids 2. explain pascal principles 3. understand the principles of the hydraulic jack, applicable to construction 4. explain the principles of hydrostatics 5. describe the physical properties of water 6. discuss liquids in motion and the principles applicable to construction 7. differentiate between hydrostatics and hydrodynamics 8. distinguish between open and closed channels

	<ul style="list-style-type: none"> 9. calculate fluid pressure in hydraulic jacks 10. calculate pressure at boundaries of immiscible liquids in tanks 11. determine cross-sectional area, wetted perimeter, and hydraulic radius of open channel 12. calculate flow rate in composite shaped open channels
<p style="text-align: center;">UNIT IV - APPLY THE PRINCIPLES OF CHEMISTRY – STRUCTURE AND STATE OF MATTER</p>	<ul style="list-style-type: none"> 1. describe the structure of an atom 2. use Bohr’s Model to construct a model outlining the components of an atom 3. outline the composition of molecules, elements, compounds and alloys 4. explain kinetic theory of matter 5. explain the nature of matter for solids, liquids, and gasses, applicable to construction 6. distinguish between ionic and covalent bonding
<p style="text-align: center;">UNIT V - APPLYING THE PRINCIPLES OF CHEMISTRY - BUILDING MATERIALS</p>	<ul style="list-style-type: none"> 1. determine the states of matter for solid, liquid, and gases 2. explain how matter undergoes changes in state by gaining or losing energy 3. differentiate between compound and mixtures

	<ol style="list-style-type: none"> 4. discuss different solid materials and liquid materials used in building systems 5. identify the elements in periodic table based on grouping 6. produced a detailed drawing of a structure for a specified element 7. illustrate ionic and covalent bonding 8. write chemical formulae of typical compounds used in buildings 9. balance chemical equations 10. assess the importance of the use of alloys in construction
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COURSES	
Performing Construction/Project Planning Techniques	OUTCOMES
	1. Develop sound project management skills.

	<p>2. Plan, organize and control resources effectively and efficiently in project management.</p> <p>3. Implement construction projects within agreed procedures and to specification.</p> <p>4. Be able to evaluate construction project outcomes.</p> <p>5. Be able to present construction project outcomes.</p>
<p>UNIT I -SAFETY, MANAGEMENT PROCESSES AND RESOURCES</p>	<ol style="list-style-type: none"> 1. Examine the process for procuring construction work. 2. Criticize the processes for managing and controlling the operation of resources and safety requirements for construction work. 3. Differentiate between different types of contracts. 4. Examine contract documents. 5. Explain the purpose of quality control, quality assurance, total quality management and quality in construction. 6. Describe factors influencing the production of Construction. 7. Explain the procedures for tendering. 8. Outline the procedure for submission of tender for the award of contra
<p>UNIT II - THE STRUCTURE OF A PROJECT</p>	<ol style="list-style-type: none"> 1. Examine the construction project life cycle. 2. Describe how the monitoring of construction work is done during the contract period.

	<ol style="list-style-type: none"> 3. Explain the process of planning and scheduling activities for a typical project. 4. Explain the various planning techniques used on a construction project. 5. Predict activity durations for activities on a construction project. 6. Demonstrate the use of various planning and scheduling methods. 7. Calculate the critical path for different networks. 8. Prepare construction programmes for given projects. 9. Outline jobs into different activities for the purposes of scheduling. 10. Use relevant techniques for production and presentation of building projects
<p style="text-align: center;">UNIT III - RISK MANAGEMENT</p>	<ol style="list-style-type: none"> 1. Define and explain risk management. 2. Explain the term earned value analysis and list the importance of same. 3. Evaluate a range of planning, organizational and control techniques with regard to utility and efficacy. 4. List the attributes of an effective project manager. 5. State the advantages and disadvantages of cultural differences in construction.
<p style="text-align: center;">UNIT IV - PLANNING FOR SITE LAYOUT</p>	<ol style="list-style-type: none"> 1. Analyze access and traffic routes when doing site layout. 2. Examine proper procedure for materials storage and handling.

	<ol style="list-style-type: none"> 3. Identify Administration offices; welfare, storage and other buildings.\ 4. Appraise plants, workshops and services needed. 5. Discuss security and safety measures required for large sites.
<p>UNIT V - PROJECT EXECUTION</p>	<ol style="list-style-type: none"> 1. Produce a record of all project procedures used. 2. Use an agreed format and appropriate media to present the outcomes of the project to an audience. 3. Prepare communication plans that demonstrate how relevant stakeholders are kept informed during a project's execution. 4. Generate change management plans that will detail justification of changes to original project plan. 5. Produce status reports to detail the status of projects being executed.
<p>UNIT VI - PROJECT EVALUATION</p>	<ol style="list-style-type: none"> 1. Use appropriate project evaluation techniques. 2. Interpret and analyze the results in terms of the original project specifications. 3. Make recommendations and justify areas for further consideration.

	4. Properly hand over construction projects to clients after project completion.
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COURSES	
Determining Bills of Quantity for Superstructure	OUTCOMES

	<ol style="list-style-type: none"> 1. Determine quantities for different components of the building's superstructure. 2. Understand the overall principles categorizing work under different work components. 3. Elaborate on the unit of measurement used in computing various quantities for building works. 4. Demonstrate competence in developing dimension, abstract and billing sheets under each component. 5. Prepare tenders based on analysis of building drawings.
<p style="text-align: center;">UNIT I -PRELIMINARIES FOR DETERMINING QUANTITIES</p>	<ol style="list-style-type: none"> 1. List general take off rules 2. Elaborate on the various documents within bills of quantities. 3. Apply principles when generating dimension, abstract and billing sheets.
<p style="text-align: center;">UNIT II - MEASUREMENT OF BLOCK WALLS</p>	<ol style="list-style-type: none"> 1. Treating with different wall thicknesses. 2. Unit of measurement for measuring blockwork. 3. Moving from units of measurements to units of scale. 4. Determining quantities for reinforcement of block wall after consulting working drawings. 5. Justify the calculation of the mean girth in determining wall quantities.

	<p>6. Generating dimension, abstract and subsequently billing sheets for wall quantities.</p>
<p>UNIT III - MEASUREMENT OF FLOORS</p>	<ol style="list-style-type: none"> 1. Formulate a logical sequence of taking off as it relates to a suspended timber floor. 2. Separate the costs for the construction of the flooring from the floor finishes to minimize error. 3. Determine various means of determining the required quantities of joists required for timber flooring. 4. Compute the required quantities for strutting and floor boarding. 5. Elaborate on the importance of the different components of a typical reinforced concrete slab on grade. 6. Calculate the required materials for constructing typical concrete slabs. 7. Prepare dimension, abstract and billing sheet for floor quantities.
<p>UNIT IV - MEASUREMENT OF ROOFING COMPONENTS</p>	<ol style="list-style-type: none"> 1. Subdivide the works for flat and pitched roof into different sections for the purpose of measurement.

	<ol style="list-style-type: none"> 2. Determine the quantities for different framing members of a typical timber roof. 3. Compute quantities for roof covering materials. 4. Calculate the required material for reinforcement in slab roofs after consulting with working drawings. 5. Determine the required cubic yards of concrete required to complete various roof slabs. 6. Prepare dimension, abstract and billing sheet for roofing quantities.
<p style="text-align: center;">UNIT V - INTERNAL FINISHES</p>	<ol style="list-style-type: none"> 1. Prepare a logical schedule of work sections, covering and finishes. 2. Determine quantities for at least two finishing areas under each section. 3. Prepare dimension, abstract and billing sheet for finishing works.
<p style="text-align: center;">UNIT VI - WINDOWS AND DOORS</p>	<ol style="list-style-type: none"> 1. Determine a systematic method of measuring windows that omits the risk of eliminating items or components. 2. Accurately differentiate between internal and external doors based on given sizes. 3. Calculate components required to properly install doors and windows. 4. Prepare dimension, abstract and billing sheet for related quantities

