MINISTRY OF EDUCATION, YOUTH & INFORMATION

Centre of Occupational Studies
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THE CENTRE OF OCCUPATIONAL STUDIES

CURRICULUM

OCCUPATIONAL ASSOCIATE DEGREE
in
CONSTRUCTION SITE MANAGEMENT

Developed By

THE CENTRE OF OCCUPATIONAL STUDIES
MINISTRY OF EDUCATION, YOUTH and INFORMATION
JAMAICA

NOTE: THIS IS A DRAFT COPY OF THE CAPTIONED CURRICULUM WHICH WAS DEVELOPED WITH THE INPUT OF STAKEHOLDERS FROM THE INDUSTRY AND EDUCATIONAL INSTITUIONS. IN KEEPING WITH THE CURRICULUM DEVELOPMENT PROCESS THE CURRICULUM WILL BE SUBJECT TO FORMATIVE/SUMMATIVE REVIEW. THE CURRICULUM WILL BE FINALISED, PACKAGED AND PROMULGATED UPON THE COMPLETION OF THE SUMMATIVE EVALUATION EXERCISE (INDUSTRY VALIDATION, ETC.).

INTRODUCTION

Aligned with the goals of the National Development Plan for Jamaica, is the thrust for educational development through opportunities of higher learning and professional development. One element of this thrust is the development and implementation of Occupational Programmes of Study. Occupational Certification is designed to bridge the gap between traditional and TVET education at the tertiary level.

Occupational Studies involves the training and assessment to support the development of competence in specific skills/occupations, designed to prepare individuals for employment. Occupational programmes are defined by the methodologies of Competency Based Education and Training (CBET), and the Technical Vocational Education Training (TVET) strategies for the development of competent workforces. A critical operational principle of the CBET Policy is that the development of Training, Assessment and Certification Programmes must be designed upon the occupational competencies of the workplace that is the needs, demands and requirements of employment.

The term **curriculum** refers to the lessons and academic content taught in a school or in a specific course or program. The design and development of this Occupational Associate Degree curriculum has incorporated the CBET Principles, the National Vocational Qualification of Jamaica, benchmarked against other international standards and similarly recognized international programmes of like nature. It is also reflective of the Educational, TVET, Social, Cultural and Economic goals of the Vision 2030 Development Plan for Jamaica.

The Occupational Degree Curriculum is designed to aid the professional and competency based pathway for persons to develop occupational competencies across the specific skill areas at various levels, with an emphasis on academic and personal cognitive development. This parallel pathway will allow persons to have comparable credentials of recognition to those of their counterpart perusing academic studies.

OCCUPATIONAL RATIONALE

A country's global competitiveness is a function of the quality of its workforce and therefore, a skilled workforce is essential for sustainable, and balanced growth. The Planning Institute of Jamaica, in the 2012 survey of living conditions, reported that the age 14 and over population without certification at any level was 69.6 per cent. Some 90.7 per cent of the poorest in the population had no certification while among the wealthiest, the figure was 53.5 per cent. Non-certification among the Prime Working Age (25 – 29) was at 70.1 percent, males with no certification was 77.1 percent, and females were 64.0 percent. In the Jamaica's capital, Kingston, the number of people without formal certification was 39.4 percent. Clearly, there is the need for relevant and accessible educational training opportunities that are designed to create a globally competitive workforce. The industry through a needs analysis, also clearly identified and defined the need for a workforce complimented by qualified employees with applied knowledge and skills in selected areas of study; to provide effective and efficient supervisory and leadership competencies.

The development of occupational certification is further rationaled by the obvious necessity to align higher education with the emerging needs of workplace and industry as well as the growing relevance of occupational certification internationally.

Philosophical Principles

Occupational Studies Programmes in are developed against the philosophical principles that,

- Professional knowledge is what a learner should know and understand regarding the subject.
- Professional skills are what a learner should be able to do.

- Core skills refer to basic skills involving dexterity and use of methods, materials, tools and instruments used to perform the job including Information Technology skills needed for that job.
- Responsibility aspect determines the
    - Nature of working relationship,
    - Level of responsibility for self and others
    - Managing change and
    - Accountability for actions.

CONTENTS

Acknowledgement

The Centre of Occupational Studies acknowledges the professional and intellectual contribution of the institutions and organisations which served in the development of the Occupational Associate Degree in Construction Site Management.

This Curriculum being designed on workplace competencies and recognized Occupational Standards, required the input and validation of trainers, lecturers, instructors, industry professionals and learning resource developers.

Paramount to the development of this curriculum was the collaborative efforts of representatives from the below entities. It is therefore with respect and regard for competent learning, up-skilling and quality service that the Centre of Occupational Studies acknowledges:

- HEART –Trust/NTA
- Excelsior Community College
- Vocational Training Development Institute

Matriculation Requirements

For matriculation or entry into the Occupational Associate Degree programme applicants must meet/possess at least one of the below requirements:

- Career Advancement Programme (CAP) NVQ/CVQ, Minimum Level 2 Certification
- HEART Trust/NTA, NVQ – Minimum Level 2 Certification
- Other entry requirements – in accordance with the respective COS Institution minimum entry requirements.
- Mature Entry

  Applicants with relevant experience of service in the sector may seek to pursue this programme. The mature entry status should be further specified and confirmed in

accordance with the relevant policies and procedures established at the institution hosting this programme. Applicants who qualify under this category must pass a college readiness test of English and Mathematics and are required to submit a professional portfolio which will be used to determine eligibility. Mature entrants may be required to complete bridging courses prior to enrollment into this programme being guided by the institutional policies and procedures specific to same.

Entry Test

All applicants requesting enrollment into this programme MUST sit the COS recommended entry test (ASSET Test).

Entry Points

- Entry at the start of the programme: Candidates can enter this OAD Programme at the commencement, year 1 semester 1.
- Entry at the start of the year two: Candidates can enter this OAD programme at the commencement of year 2 semester 1, provided the candidate satisfies the minimum proficiency rating of the demonstrated occupational outcomes of all prerequisite and prior sequenced courses in the year 1.

Exemptions

Prior Learning Assessment/Advanced placement may be sought by trainees who have successfully completed courses taken through a recognized technical vocational institution or recognized certifying body. Trainees may apply for credit transfer in accordance with the Transfer Policies and Procedures of the institution offering this programme, in consultation with the COS. Successful applicants will receive exemptions from eligible units of competency once requirements for obtaining credit transfer are satisfied.

Design Format

This Curriculum is packaged in discrete Courses of Employable Skills which can be independently delivered and assessed; however, there are courses which are competency builders for others.

These courses, although independently teachable and assessable, may be prerequisite courses and should be attained by the student prior to commencement of the respective course to be pursued.

Programme Structure

The Occupational Associate Degree Programme is structured to be delivered over 4/5 semesters. The programme should be completed within the limits as stated below:

- By full-time study the programme is normally two years. The time limit to complete the programme must not exceed three years.
- By part-time study, the programme is expected to be completed within three years, but must not exceed four years.

The programmes are structured to provide a mixture of:

- general education courses
- support courses
- specialized courses
- industry experience

The Programme Structure consists of a number of Courses. The following are the components of each course:

1. Course Parameters

The parameters detail the name of the *faculty*, the *programme name*, the *course name*, the *course code*, the *credit hours*, the *credit value*, *semester and year*, *prerequisite course*; and the *approving authority*.

2. Learning Outcomes and Instructional Objectives

The set the boundaries for the learners' attainment, as well, as that for the instructors'/lecturers' delivery of content.

3. Units

The Units are the building blocks for the course; they have *Specific Objectives*, which form the instructional strategies for the delivery of the unit and the basis for the development of assessment strategies and project assignments. The course content is each Unit. It sets the range and depth of knowledge, skills and attitudes to be covered by each instructor/lecturer. It serves to standardize the instructors/lecturers.

4. Credit Hours & Credit Value

Credit Hours is the time suggested for the duration of the delivery time. Credit Value is the credit requirements aligned with the credit hours, for certification or the granting of the Award. The theory courses are calculated as 15 hours per credit with a minimum of 45 hours of instruction and practical courses are calculated at 45 hours per credit with a maximum of 4-6 credits per course.

5. Capstone Experience

The Capstone Experience outlines industry specific tasks/assignments the students will undertake to consolidate their learning by incorporating the competencies gained. Students' capstone experience is represented in a project, undertaken after successful completing and acquiring the requisite competencies of all courses in the programme.

6. Resources

The resources required to support the attainment of the learning and instructional objectives are indicated, these often include: human resources, materials, text, etc.

7. Industry Experience – Internship/Externship

The Associate Degree programmes include a work experience component which allows students to gain practical skills and observe and apply management principles and theories. Students pursuing an this degree are required to complete 240 hours of Industry Experience. Exemptions may be granted at the discretion of the institution.

8. Methodology

The methods of delivery are the suggested instructional strategies use in the delivery of the specific programme. **These learning strategies are intended to encourage, in each student, the following competencies; the ability to:**

- manage resources within defined areas of work
- make independent choices and solve routine problems independently
- transfer and apply theoretical concepts and technical skills to a range of contexts
- judge the reliability and validity of different sources of information
- manage, under guidance, ethical and professional issues in accordance with current professional and/or ethical codes or practices
- understand the importance of Standard English in written, spoken or visual messages in the field of Renewable Energy
- understand the value of life-long learning to a professional in the field of Renewable Energy
- demonstrate awareness of own and others' roles, responsibilities and contributions when carrying out and evaluating tasks
- demonstrate tolerance and temperance when interacting with others.
- develop the performance of the requisite technical competencies relevant to the unit and the course of study
- increase the independence of the learner
- create critical thinkers
- equip learners to enter the corporate world

A variety of strategies will be used to facilitate student learning and competency development. The list includes, but is not limited to, combinations of the following:

- Interactive lectures
- guest lectures
- group discussions/ Think-pair-share
- case studies
- audio visual presentations
- independent study

- individual/group research/projects
- individual/group presentations
- laboratory work
- practical demonstrations
- problem solving
- site visits (including virtual visits)
- seminars/workshops
- blended delivery to include the use of the Internet/Intranet

9. Occupational Assessment (OA) & Evaluation

The curriculum is designed to accommodate occupational assessment and evaluation, similar to that of competency based assessment. This is where student learning, competency development and demonstrated performance is assessed on an on-going basis in alignment with the specific learning outcomes for each course. This approach allows for corrective development and learning.

All assessment is designed to measure the level of mastery a student has achieved of the competencies stated in the course syllabus. Student competencies are displayed, as much as possible, in a real or simulated workplace environment. Where it is not possible for this to be done, students are presented with an opportunity to display competencies in a context that is familiar to them.

Assessment instruments are designed to produce valid and reliable grades that are used to inform planning, and competencies are measured in contexts which are student-centered, and provide opportunity for verification of the authenticity of students' work.

Occupational Assessment for this programme will outline in each course outline:

- the suggested unit/ cluster-of-units to be assessed, (for example, UNIT I, II and III)
- the suggested strategy/type(s) of Occupational Assessment (OA), (example, OA – Group research paper and presentation)

- the percentage weight which each grade will represent in the final grading for rating, (for example, 20%)

An occupational assessment/evaluation can be a combination of any of the following.

- Tests/written paper
- Laboratory activities
- Practical demonstrations (in-class, field)
- Projects (individual or group)
- Oral reports and presentations (in-class)
- Graphical displays
- Self and peer evaluations

In applying an on-going assessment approach, the view of final examination will must not be observed, instead assessment which is scheduled at the end of the semester will cover the remaining units to be to be assessed. The facilitating team within the institution has the liberty to determine to, should the need be observed, minimally include previously assessed units based on an alignment with the main units to be assessed.

The end of semester assessment will be any of or a combination of any of the following:

- Multiple Choice Questions (MCQs) & Structure Questions (SQs)
- Practical Assignments (PAs)

Portfolio of Assessment

A Portfolio of Occupational Assessment will be developed by each student on a per semester basis. The portfolio is intended to capture for external verification purposes, evidences of occupational assessment activities and related outcomes. The institution is required to provide mentoring to students in the development of individual portfolios.

Feedback

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence/instrument.

10. Proficiency Rating/Grading Scheme

A student's ***final grade*** which determines the ***competency rating*** is calculated by the combination of the on-going assessment grades. *See the Grading Scheme below.*

11. Recommendations to Programme Administrators/Lecturers

This Occupational Associate Degree is designed on the CBET Principles to reflect the requirements of industry, as well as, that of the learning institution. It is therefore important that individuals responsible for programme administration, programme delivery and the management of the assessment and certification processes exercises due process to actualize the principles of Competency Based Education and Training (CBET) in the Teaching and Learning experiences. It is being recommended that Experiential Learning Strategies be a critical feature of the process. The Assessment Processes employs Authentic and Fair Assessment Strategies to confirm students' competencies. Assessment should not only be for the confirmation of competence but also be used as a catalyst for improving the instructional process and students' achievements.

Awarding of Degree

Upon completion of the below, participants who have pursued the Construction Site Management programme with be awarded an ***Occupational Associate Degree in Construction Site Management***

Participants must have:

1. completed all courses as specified by the programme
2. completed two hundred and forty (240) hours of Work Experience
3. met all other requirements as outlined by individual institutions and the *Centre of Occupational Studies within the Ministry of Education Youth and Information.*

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COS PROFICIENCY RATING GRID

Mark Range (where applicable)	Grade Point Average (GPA)	Letter Grade	Description
90 – 100%	4.00	A	**High Competence:** where the student has demonstrated highly original, relevant and sophisticated applications of research, appraisal, enquiry and evaluation techniques resulting in innovative concepts that challenge existing conventions In the field of study.
85 – 89%	3.70	A-	**Competence with Distinction:** where the student has demonstrated a high level of performance indicating depth and breadth in research, appraisal, enquiry and evaluation with broad application of knowledge of theoretical concepts, and applied analytical thought.
80 – 84%	3.30	B	**Competence with Credit: where the student has untaken an innovative and creative interpretation of assessment briefs, and has provided evidence of extended research and inquiry applied to assessments tasks.**
75 – 79%	3.00		
70-74	2.70	B-	**Competent: where student has met all requirements of assessment tasks to a satisfactory level.**
65-69	2.30	C	
60-65	2.00		
55-59	1.70	C-	
50-54	1.30		
Under 50 (45-49)	1.00	D	**NYC: where the student has not demonstrated satisfactory performance in assessment tasks or has not met subject requirements.**
Under 45	1.00	E	
NYC of a 'must pass event'			**Not Yet Competent:** where the student has an overall mark for the subject at a passing level, but has not demonstrated satisfactory performance to be deemed competent.

Withdrawn no penalty:

a) Where the student has withdrawn from the subject on or before the census date
b) Where the student has withdrawn from subject after consultation, without penalty
c) Where the student has withdrawn from the subject due to serious illness or misadventure

Deferred result: Where, for approved reasons, health or misadventure, a student is allowed to resubmit an assessment or sit an exam at a later date.

PROFILE
OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT

Programme Rationale

The Construction Industry has been targeted as one of the growth areas within the Jamaica 2030 Development Plan. Imperial industry data indicates that the industry requires persons at the middle and lower management level to improve and sustain growth, development, productivity and to manage construction site activities.

It has been further identified that there is a need for a workforce complimented by qualified employees with applied knowledge and skills in selected areas of study; to provide effective and efficient supervisory and leadership competencies. Giving regard to these factors, as well as the mandates of the Centre of Occupational studies, the development of the Occupational Associate Degree in Construction Site Management was undertaken.

Programme Description

The Occupational Associate Degree Programme in Construction Site Management is an Applied Associate Degree which is designed on workplace competencies with the intent to provide workforce solutions in the construction development.

The Construction Site Management Programme provides training and certification to persons operating at or who intends to operate at the lower to middle management levels of the Construction Industry. The programme contents will expose participants to the technical, operational processes and managerial competencies required to manage construction sites activities of small and medium construction projects and related activities in areas such as, occupational health and safety in construction, drawing technologies, erecting structures – concrete and wooden, Geometric drawings, contract development, project management, steel fixing, building finishes, etc.

The duration of study is projected for two years across four administrative semesters and a summer internship/externship (work attachment component) component. The programme design combines related underpinning academic competencies with the practical occupational competencies. The programme allows for a "work-ready" and "employable" graduate who can contribute to and create/add value to their place of employment, the industry and the nation. The development of these competencies are complimented by the professional development courses in in this programme; aimed at developing an occupational and workplace competent individual, through application of critical employability skills; science, technology, engineering, arts and mathematics (STEAM) skills and a general awareness of, sensitivity to and appreciation for human diversity. As such, the programme takes a learner-centred approach to instruction and considers the varied needs of students in the use of instructional and assessment strategies.

The programme is also designed at a level where graduates can not only earn an institutional certification, but in addition, professional and or industry recognitions including license required for professional practice. At the end of the programme, students who are deemed competent in the specific requirements for this programme/successful will be awarded an **Occupational Associate Degree in Construction Site Management.**

Programme Goals

The Construction Site Management Programme addresses the growing need for persons with competencies related to the Management of Construction Sites. The programme seeks to produce graduates who will exhibit the abilities and competencies to function at the junior management level with the capacity to grow and develop in the industry and continue on to higher levels of education.
Upon completion of this programme graduates should be able to:

- Manage small to medium construction sites projects
- Meet project targets and schedules
- Make decisions and judgment within scope of responsibility
- Minimize/eliminate project cost over runs
- Maintain project within budgetary limits

- Manage productivity issues
- Train and develop project teams

PROGRAMME STRUCTURE AND SEMESTERISATION

Year 1 – Semester 1

Course Code	Course	Credit Value	Credit Hours
	Using Computer Applications	1	45
	Using Communications Skills I	3	45
	Performing Mathematics for Construction Site Management I	3	45
	Practicing Occupational Health, Safety Requirement and the Environmental impact	3	45
	Preparing Sites and Carry out Steel-fixing	4	120
	Preparing Geometric Drawings and Sketches	3	45
	Providing Quality Customer Service	2	30
Total	**7**	**22**	**375**

Year 1 – Semester 2

Course Code	Course	Credit Value	Credit Hours
	Erecting Concrete Structures	4	120
	Using Drawing Technologies 1 (AutoCAD)	4	120
	Erecting Wooden Structures	4	120
	Using Communication Skills II	3	45
	Performing Mathematics for Construction Site Management II	3	45

	Applying the Principles of Physics and Chemistry to Construction	3	45
	Construction Project Management and Contract Procedures	3	45
Total	**7**	27	540

Year 2 – Semester 3

Course Code	Course	Credit Value	Credit Hours
	Performing Site Surveying practices	4	120
	Erecting roof structures	4	120
	Using Drawing Technologies 2 (Rivet)	4	120
	Practicing National Building Codes and Regulations	3	45
	Determining Bill of Quantities 1	3	45
	Applying building finishes	4	120
	Conversational Spanish	2	30
Total	**7**	**23**	**600**

Year 2 – Semester 4

Course Code	Course	Credit Value	Credit Hours
	Determining Bills of Quantities 2	3	45
	Developing Entrepreneurship Strategies	3	45
	Construction/Project Planning Techniques	3	45
	Externship(Work Attachment)	1	240
	Using Employability Skills	3	45
	Acquiring Professional and Industry Certification	1	15
	Applying Voice and Speech in the Workplace	1	45
	Major Capstone Project	2	90
	Internship/Externship (Work Attachment)	6	240
Total	**8**	**21**	**810**

Course Codes: Note that all programme and course codes are under official review. Final approved programme and course codes will be communicated through a revision and promulgation of this document.

Course Outlines

Year1 Semester 1

FACULTY OF CONSTRUCTION and ENGINEERING	
PROGRAMME:	OCCUATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	USING COMMUNCIATION SKILLS 1
COURSE CODE:	**CSMCOM102S1**
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3
PREREQUISITES:	NONE
YEAR/SEM.:	YEAR 1, SEMESTER 1
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to give the students the knowledge, skills and aptitudes to develop and use standard communication and presentation skills that are important to and necessary in the Industry and for their personal and professional development.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon successful completion of this course, students are competent when they are able to:

1. communicate in Standard English
2. identify their behavioral styles and communication challenges associated.
3. use models for feedback, communication and listening
4. organize information in a clear and concise manner in writing and speech
5. create a positively impactful introduction
6. implement techniques for varying tones, pitch and body language

7. use their communications skills to the fullest effect
8. demonstrate the fundamentals of effective public speaking

UNIT I: USE COMMUNICATION PROCESS 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 name the elements of the communication process
1.2 describe the communication process
1.3 identify the barriers to communication
1.4 apply the forms of communication to everyday life

Content:

The content should include but is not limited to:

- Elements of communication
- The communication process
- Barriers to effective communication
- Forms of communication

UNIT II: USE DIFFERENT COMMUNICATION STYLES 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 discuss types of sentences, phrases and clauses
2.2 identify main ideas
2.3 assess idea linkages
2.4 practice improving his/her content and delivery

Content

The content should include but is not limited to:

- Types of sentences, phrases and clauses

- Main ideas
- Idea linkages
- Language usage – Figurative, Rhetorical
- How to improve content and delivery

UNIT III: USING LISTENING TECHNIQUES 12 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 focus on the speaker

3.2 identify details

3.3 empathize with what is being said

3.4 analyze and respond to the speaker

3.5 identify and address the major barriers to effecting listening.

Content

The content should include but is not limited to:

- How messages are sent and received
- Identifying details
    - Word choice, idioms and cliché
    - Tone and allusion
    - Determining speaker intent
    - Denotation and connotation
- Conversion from direct to indirect speech and vice versa
- Listening techniques
- Deciphering what is important and less important

UNIT IV USE SPEAKING AND WRITING TECHNIQUES 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 communicate with customers and coworkers using Standard English

4.2 demonstrate speaking techniques

4.3 use writing techniques

4.4 write and deliver speeches

Content

The content should include but is not limited to:

- The parts of speech
- Correct use of pronouns
- Comparison of adjectives
- The function of words
- Precise writing and note-taking
- Figures of speech, idioms, metaphors, similes, etc.

UNIT V: COMMUNICATE TO INFLUENCE AND INSPIRE 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 select the correct words and phrases to communicate

5.2 use communication inspire and influence customers and coworker

5.3 use industry language to communicate and inspire performance

Content

The content should include but is not limited to:

- Methods of communication
- Techniques to Inspire and Influence

……

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

ASSESSMENT:

Course Work 40%

Practical 20%

Final Work 40%

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I**	Two in-course tests	20%
2	**I,IV**	Practical Assignments/Projects	20%
3	**I,II,III**	Field/Laboratory/Practical Activities	40%
4	**II,V**	End of Semester Examination	20%
Total			**100%**

FEEDBACK

Students will be given rubrics and grading schemes within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

INSTRUCTIONAL METHODS

This course will be taught using a combination of:

- Formal lectures
- Discussions
- Visits to Geriatric Care Facilities
- Presentations

RESOURCES

1. Zeuschner, R. *Communicating Today: The Essentials*. (2003). California State University Pearson Education, Inc.
2. Verlinden, J., W. (2005). *Critical Thinking and Everyday Argument*. Cengage learning

FACULTY OF COMPUTER and ENGINEERING	
PROGRAMME:	OCCUATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	USING COMPUTER APPLICATIONS
COURSE CODE:	**CSMCAP101S1**
COURSE HOURS:	75 HOURS
CREDIT VALUE:	3
PREREQUISITES:	NONE
YEAR/SEM.:	YEAR 1, SEMESTER 1
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to equip students with internet search skills, word processing, spreadsheet, and presentation graphics and database software skills that will allow them to produce documents and perform routine data analysis functions that would be required of an entry level professional.

LEARNER OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon successful completion of this unit, students are competent when they are able to:

1. locate information on the world wide web
2. understand the importance of productivity tools for workplace efficiency
3. develop knowledge and skills useful for producing documents, managing and analyzing data

UNIT I: USE THE INTERNET AND THE WORLD WIDE WEB 3 Hours

Specific Objectives

Upon successful completion of this unit, students are competent when they are able to:

1.1 use a web browser to access a web page
1.2 use a search engine to locate information on the web
1.3 send and receive e-mail

Content

The content should include but is not limited to:

- Using a browser (view and clear the history, create bookmarks, open a new window)
- Using a search engine:
    - The difference between the internet and the world wide web
    - Basic search
    - Filter search
    - By time, date, images, maps etc.
- Sending and receiving email (reply, reply to all, forwarding, attachments, copying (cc))

UNIT II – Word Processing (12 Hours)

Specific Objectives

Upon successful completion of this unit, students are competent when they are able to:

2.1 format a report using pre-defined word processing features
2.2 APA or other writing styles to prepare documents
2.3 editing tools to increase efficiency
2.4 insert objects into a document
2.5 prepare letters for multiple recipients
2.6 print documents

Content

The content should include but is not limited to:

- Format a report using pre-defined word processing features
    - Text formatting (font type & size, italics, bold, centre, left-align, right-align, underline, subscript, superscript)

- Paragraph formatting (paragraph spacing, line spacing, prevent heading from separating from a paragraph, keep paragraph from separating inappropriately)
- Page formatting (orientation, size, numbering, page break, section break

- APA or other writing styles to produce term papers
  - insert citations (from books, journals, electronic sources etc)
  - format quotations (long & short)
  - format headings for inclusion in the software-generated table of contents
  - insert headers, footers, footnotes
  - generate bibliography/reference list
  - generate and edit table of contents
- Use editing tools to increase efficiency (copy & paste, find and replace, spell check, bullet and numbering)
- Inserting objects (picture, shapes, organizational chart)
- prepare letters for multiple recipients
  - layout of a block style letter (insert date, centre letter on page)
  - link letter with recipient's list
  - insert recipient information
  - perform mail merge (all records, specific records, for printing)
- Printing (single and multiple copies, selected pages)

UNIT III – PRESENTATION GRAPHICS (6 Hours)

Specific Objectives

Upon successful completion of this unit, students are competent when they are able to:

3.1 create a presentation

3.2 run a presentation

3.3 modify a presentation

3.4 print a presentation

Content

The content should include but is not limited to:

- Creating a presentation/slideshow
    - Add new slides
    - Insert objects (text, picture, graph, table, video, sound, hyperlink)
    - Animate objects (customized animation, timing)
- Run a presentation (from the beginning, from selected slide)
- View and edit presentations
- Modify slides (insert new slides, insert duplicate slides, delete slides, rearrange slides, slide design, slide background)
- Print presentation (single slides, Handouts, Notes Page)

UNIT IV – SPREADSHEETS (12 Hours)

Specific Objectives

Upon successful completion of this unit, students are competent when they are able to:

4.1 use formulas and functions to manipulate and analyze data

4.2 use a formula to manipulate data located in another worksheet

4.3 format cell data

4.4 create and format graphs

4.5 format a workbook page

4.6 print in spreadsheet

Content

The content should include but is not limited to:

- Formulas and functions:
    - Add, subtract, multiply and divide values in a range
    - Convert measurements from one unit to another
    - Calculate the average of numbers in a range
    - Determine the smallest number in a range
    - Determine the largest number in a range
    - Extract data that meet given criteria

- Log tables
- Loan amortization
- Goal seek/data tables
- Round numbers to a specified decimal place
- Use range names
- Data validation prevents inappropriate entries and gives appropriate error message
- Nested functions are used to provide solutions to complex problems

- Use conditional formulas (if, sum if, count if, lookup, hookup)
- Insert/delete row, column, cell, cell data
- Date operations (insert current and other date)
- Calculate the difference between two dates
- Sort data ascending or descending order (using single column, using multiple column)
- Format data (number, date, conditional, protect/lock cells, merge cells, merge & centre)
- Use a formula to manipulate data located in another worksheet
    - Copying formulas and functions (Absolute cell referencing, Relative cell referencing)
- Page formatting:
    - Default margins, Changing the margins (Left, Right, top, bottom)
    - Default paper size, Changing Paper size (Letter size, Legal size)
    - Page Orientation
    - Add header/footer, custom header/footer
- Create and format graphs (including scatter graph, line graph, pie chart, bar graph)
    - Insert chart titles, axes, gridlines, legends, labels, the data source, trend lines
    - Save graph (as separate sheet, as part of current sheet)
- Printing spreadsheet (entire worksheet, specific parts of worksheet, scaling page)

UNIT V – DATABASE MANAGEMENT (10 Hours)

Specific Objectives

Upon successful completion of this unit, students are competent when they are able to:

6.1 define key database terms: field, record, relational database, primary key and foreign key

6.2 create a database table

6.3 manipulate a database table

6.4 create a relationship between two tables

6.5 create queries, forms and reports

6.6 import data from a spreadsheet

Content

The content should include but is not limited to:

- Define the terms: field, record, relational database, primary key and foreign key
- Create a database table
    - Define fields (data type, properties – default value, validation rule, validation text, data required, duplicates allowed, caption)
    - Select/assign primary key
    - Populate table
- Manipulate a table
    - Modify the structure of a table (delete, move and add fields)
    - Copy records, Insert, delete and change records
- Create a relationship between two tables
- Querying a Database (select, update, delete)
    - Sort data in a query
    - Logical operators (exact match, and, or)
    - Using wildcard to specify search/selection criteria
- Reports
    - Create report (using data from a table, from a query)
    - Insert a picture in a report
- Importing data from a spreadsheet

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ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I,II**	Two in-course tests	20%
2	**I,II,III**	Practical Assignments/Projects	20%
3	**I,II,III,IV,V**	Field/Laboratory/Practical Activities	40%
4	**V**	End of Semester Examination	20%
Total			**100%**

FEEDBACK

Students will be given rubrics and grading schemes within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

INSTRUCTIONAL METHODS

This course will be taught using a combination of:

- Formal lectures
- Discussions
- Geriatric Care Facility Visits
- Presentations

CAPSTONE EXPERIENCE DESCRIPTION

The project should require that students demonstrate competencies in each the use of the productivity tool to:

- format a report/school assignment according to the rules of a formal documentation style
- solve a problem that would be encountered in a Geriatric Care facility workspace.

Students may select their own project for which the measurement criteria for assessing competency attainment would have been given at the beginning of the semester.

The student must provide the teacher with a written project description which will provide evidence that the project is of such that it will allow for students to display the relevant competencies in a context that is applicable to the Geriatric Care sector.

The teacher will give written approval before the student begins work on the project.

As evidence of competence for (a) above, an assignment that was produced for another course in the programme may be submitted for grading. Marks will be awarded for evidence of competencies in the use of a word processing software to create and format an assignment according to the rules of a formal documentation style, not for content.

It is expected that the teacher will provide guidance throughout the life of the project. It is expected, also, that the teacher's feedback will provide information that serve as a guide for students to recognize and correct errors in their work. The intent must always be for students to be able to improve the quality of the evidence of competency that they submit for marking.

It is recommended that students complete each component of the project as the relevant competencies are attained, as this will make the work more manageable.

The project will be submitted for grading at the end of the instructional period. A signed statement by the student, to indicate that the submission is work of his or her own effort, must accompany the submission.

The teacher, having monitored the student throughout, will also submit, along with the grades and a sample taken from the population of student's work, a signed statement that indicate that the teacher has taken all reasonable steps to ensure that each grade was earned by the student's own effort.

SCORING RUBRICS

Report

COMPETENCIES	MARKS ALOTTED	MARKS EARNED
Correct margins	**1**	
- adjusted for binding (1)		
- not adjusted for binding (0)		
Page number	**1**	
- present and appropriately formatted (1)		
Sections	**2**	
- page formatting *(orientation, size, or margins)* changed within the document		
Paragraph formatting	**5**	
- appropriate indentation (1)		
- appropriate line spacing (1)		
- appropriate font type (1)		
- appropriate font size (1)		
- no inappropriate breaks (1)		
Main headings	**3**	
- ALL appropriately formatted (2)		
- formatted using the word processing styles feature (1)		
Sub headings	**3**	
- ALL appropriately formatted (2)		
- formatted using the word processing styles feature (1)		
Object included	**1**	
Table of contents	**1**	
- table of content present and generated by software (1)		
- not generated by software (0)		
Citation	**1**	
- using the appropriate software feature (1) - created but not using the software feature (0)		
Reference list appropriately formatted	**4**	
- appropriately indented (1)		
- appropriately arranged (1)		
- appropriate line spacing (1)		
- generated by software (1)		
TOTAL	**22**	

LETTER AND MAIL MERGE

COMPETENCIES	MARKS ALOTTED	MARKS EARNED
Appropriate letter head	**1**	
Date inserted by software	**1**	
Appropriate formatting	**6**	
- Correct margins (1)		
- Paragraph spacing (1)		
- Paragraph indentation (1)		
- Line spacing (1)		
- Font (1)		
- Text appropriately positioned on the page (1)		
Mail Merge	**5**	
Primary document (1)		
Appropriate mail merge fields (1)		
Source document (1)		
Merge is correct (1)		
TOTAL MARKS	**13**	

SPREADSHEET MARK SHEME

COMPETENCIES	MARKS ALOTTED	MARKS EARNED
Use formulas and functions:		
Formulas are appropriate for solving the stated problem	2	
Data validation prevents inappropriate entries and gives appropriate error message	2	
Sort data using more than one variable	1	
Formula duplicated and data is correct *(Constants are placed in cells, data is not placed directly in formula)*	1	
Lookup function returns correct values from table in a separate spreadsheet	1	
Correct action is performed based on given criterion or other appropriate data	1	
Measurement is correctly converted from one unit to another	1	
Numbers are rounded using appropriate spreadsheet function	1	
Conditional formatting is used to highlight exceptions	1	
Date function appropriately used	1	
Goal seek/Data table/log table appropriately used and produces correct information	2	
Formatting/Layout		
Spreadsheet is laid out to facilitate insertion/deletion	1	
Spreadsheet is laid out so that it can be easily interpreted	1	
Inserted row/column does not affect previously inserted spreadsheet formulae	1	
Footer/header used to communicate appropriate information	1	

Column and row headings are appropriate	1	
Page size/orientation appropriate	1	
Graphs		
Appropriate charts to represent spreadsheet data are created	2	
Graphs are appropriately labelled	1	
Extracting data to allow summary information	2	
TOTAL	**25**	

DATABASE MARK SHEME

COMPETENCIES	MARKS ALOTTED	MARKS EARNED
Create and Maintain a SQL Database:		
Create tables using correct field definition and data type	3	
appropriate primary key defined	1	
Modify data *(add/delete, sort)*	2	
Modify table structure *(add/delete fields, change field properties)*	1	
Querying a Database		
data from multiple tables/queries used to generate a new table	2	
query used to modify field content	1	
query used to remove records	1	
multiple conditions used in queries	2	
Reports		
Report on specified fields are generated	2	
Data is grouped	1	
Data is sorted	1	
Data is appropriately summarised *(totalled, averaged, counted etc)*	2	
Header/footer is appropriately used	1	
TOTAL MARKS	**20**	

POWERPOINT PRESENTATION MARK SCHEME

COMPETENCIES	MARKS ALOTTED	MARKS EARNED
Create a Presentation	**8**	
- insert a slide (1)		
- insert duplicate slides (1)		
- delete slide (1)		
- re-arrange slide (1)		
- change presentation design (1)		
- change design for selected slides only (1)		
- format presentation background (1)		
- format individual slide background (1)		
Inserting Elements (graphics, video, sound)	**3**	
- graphics (1)		
- video (1)		
- sound (1)		
Animation	**2**	
- animate an object (1)		
- animate a slide (1)		
Timing	**2**	
- slide transition (1)		
- object transition (1)		
TOTAL MARKS	**15**	

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	PERFORMING MATHEMATICS FOR CONSTRUCTION SITE MANAGEMENT I
COURSE CODE:	CSMMAT103S1
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3 CREDITS
PREREQUISITES:	
YEAR/SEM.:	YEAR 1, SEMESTER 1
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to equip students with the mathematical foundation needed to perform mathematical calculations in a demanding field, gain experience in logic and reasoning and overall improve their critical thinking skills. They are given further opportunities to hone their problem solving skills in resolving the challenges posed in practical situations. The projects designed in this course is in furtherance of this aim.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. demonstrate an understanding of converting from the metric system of measurement to the imperial system
2. demonstrate an understanding of geometrical figures/shapes in the calculation of length of sides as well as to in establishing symmetry, congruence and similarity

3. understand the perimeter and areas of plane figures as well as the surface area and volume of solids
4. use formula transposition and dimensional analysis in manipulating formulae an in the determination of their validity
5. understand the principles of interest, discounts, depreciation and marginal analysis in the determination of the viability/profitability of businesses
6. demonstrate knowledge of statistics to process and analyse data and present reports
7. solve quadratic equation
8. introduce matrix algebra culminating with the solution of a system of simultaneous equations

UNIT I: ASSOCIATE MEASUREMENTS/CONVERSIONS WITH INSTRUMENTS

5 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 convert lengths, weight and other quantities from metric and imperial measures

1.2 measure a variety of lengths and angles

1.3 recognize the customary angles

1.4 convert time readings from a 12-hour clock to a 24-hour clock and vice versa

1.5 change temperatures in degrees Celsius to degrees Fahrenheit and vice versus

Content

The content should include but is not limited to:

- Converting for: -
    - lengths within:
        1. the metric system mm up to km and the imperial system inches, feet, yards, chains, furlongs and miles
        2. areas (such as acres to hectares) and from mm^2 to m^2 and hm^2
        3. volumes in metric (from mm^3 to m^3, dm^3 and hm^2; millitres (ml) to litres (l)) and imperial measures in pints, quarts and gallons and conversions across the two systems
    - weights within:

1. the metric system (mg to kg); metric tonne to kg; ounces, pounds, stones and the British tons

- convert between the systems
    1. time from a 24-hour clock to that a 12-hour clock and vice versa
    2. temperature from Celsius to Fahrenheit
- Measure lengths with ruler in inches and centimetres

UNIT II: USE THE PRINCIPLES IN SIMPLE GEOMETRY 5 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1. recognize plane shapes and solids encountered

2.2. develop a visual recognition of commonly used angles

2.3. calculate unknown angles using the theorems relating to angles on a straight line, angles at a point, angles in a triangle, in a quadrilateral and polygon

2.4. calculate unknown angles based on theorems relating to the angles formed when two parallel lines are cut by another inclined line

2.5. use Pythagoras' Theorem for the determination of the third side of a right-angled triangle

2.6. compute other sides of a triangle using Apollonius' Theorem

Content

The content should include but is not limited to:

- Recognition of shapes:
    - plane figures: triangles, quadrilaterals (squares, rectangles, parallelogram, trapezium, rhombus, polygons)
    - solids: cubes, cuboids, prisms, cylinders, cones, spheres, and pyramid
- Development of visual recognition of commonly used angles- 30^o, 45^o, 60^o, 90^o & 120^o
- Calculation of unknown angles using theorems for:
    - straight lines
    - triangles
    - quadrilaterals
    - circles

- polygon

- Computation/calculation of a side based:
  - physical measurement
  - Pythagoras' Theorem
  - Apollonius' Theorem

UNIT III: USE THE PRINCIPLES IN TRIGONOMETRY 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 use Pythagoras' Theorem for the determination of the third side of a right-angled triangle

3.2 calculate the length of sides and the size of angles using trigonometric ratios a right-angled triangle

3.3 use the sine, cosine and tangent rule in the calculating the length of sides and the size of angles of a scalene or non-right angled triangle

3.4 compute the tangent ratio, slope or gradient of a line

Content

The content should include but is not limited to:

- Computation/calculation of:
  - lengths trigonometric ratios and angles for right-angled triangles using:
    1. Pythagoras' Theorem
    2. trigonometric ratios
  - length of sides and size of angles for a non-right angled triangles using:
    1. sine rule
    2. cosine rule
    3. tangent rule
  - slopes or gradients of a line

UNIT IV: INTRODUCING STATISTICS IN DATA COMPILATION/INTERPRETATION 7 Hours

Specific Objectives:

Upon completion of this unit, students are competent when they are able to:

4.1 define probability
4.2 compute probability for situations involving random or chance events
4.3 work with summation notation
4.4 calculate measures of central tendency (mean, mode and median)
4.5 calculate measures of dispersion (ranges, standard deviation and variance, etc.)
4.6 analyze statistical data presented in graphical and tabular forms
4.7 prepare charts, histograms and frequency polygons from data in the restaurant

Content

The content should include but is not limited to:

Probability:-

- Definition
- Calculation for:
    - experimental objects (deck of cards, die, balls)
    - other situation involving random selections from numbers, alphabet, etc.
- Summation notations
- Measures of central tendency: mean, mode and median
- Measures of dispersion: range, inter-quartile range, quartile deviation (semi-interquartile range), standard deviation and variance, mean deviation and coefficient of variation
- Graphical presentation of statistical data:
    - Charts/graphs: pie, bar and histograms
    - Graphs: line, frequency polygons and cumulative frequency curves (ogives)

UNIT V: COMPUTING PERIMETERS, AREAS AND VOLUMES FOR SPECIFIED SHAPES 6 Hours

Specific Objectives:

Upon completion of this unit, students are competent when they are able to:

5.1 calculate the perimeter and areas of plane figures/shapes

5.2 calculate the surface area and volume of plane solids

5.3 compute arc length, circumference and area of the circles, its sectors or segments

5.4 compute the perimeter and area of a polygon.

5.5 compute the perimeter, areas and volumes of combined shape for plane figures and solids

Content

The content should include but is not limited to:

- Calculation of:
  - the perimeter and area of plane figures
  - the surface area and volumes of solids
  - the circumference and area of a circle
  - arc length, area of sectors and segments of a circle
  - perimeter and area of polygons
  - surface area and volume of solids
- Computing the following:
  - the perimeter and area of combined plane shapes
  - the volume of combined solids

UNIT VI: TRANSPOSING BASIC FORMULAE 5 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

6.1 associate a formula with a specific physical situation/event

6.2 test a formula for validity using dimensional analysis (the physical units)

6.3 transpose a variable to become the subject of a formulae through algebraic manipulations

6.4 test the newly derived formula for validity

Content

The content should include but is not limited to:

- Association of formulae with physical phenomenon
  - matter – pressure (P=F/A), density ($\rho = M/V$), expansion (linear, $l_{\propto} = \propto l_o T$,
  - area, $A = \beta A_{0T}$ and volume, $V_t = \gamma V_o T$), thermal conductivity; Q/t =

$kA\frac{\Delta l}{\Delta t}$

- insulation in series, $\frac{1}{U} = \frac{1}{U_1} + \frac{1}{U_2} + \frac{1}{U_3}$; insulation in parallel, $U = U_1 + U_2 + U_3$
- waves – sound waves, and light, $v = f\lambda$
- electricity - Ohm's Law, V= IR, resistors in parallel, $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$; resistors in series, $R = R_1 + R_2 + R_3$

- Testing of:
  - derived formulae for validity using dimensional analysis
  - manipulated formulae by substitution
- Transposition of formulae using:
  - algebraic manipulations
  - miscellaneous techniques

UNIT VII: APPLY THE PRINCIPLES OF CONSUMER/FINANCIAL MATHEMATICS 10 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

7.1 calculate percentages, profit and loss and discounts

7.2 solve worded problems involving simple and compound interest together with the related accumulated sum using variable interest rates

7.3 determine profit/gain or loss, percentage profit or loss and cost price or selling price

7.4 convert between currencies

7.5 calculate VAT such as GCT payable on goods and services

7.6 solve worded problems with discounts, percentage discount, initial price and discounted price

7.7 solve problems involving wages, salaries, overtime pay, commissions, taxes and personal tax allowance

7.8 perform calculations relating to hire purchase

7.9 manipulate the variables in simple and compound depreciation and appreciation obtaining percentages, depreciated values, appreciated values or initial values of assets

7.10 determine rates applicable in arriving at the sums payable on bills (utilities bills)

7.11 develop proficiency in the use of an electronic calculator

Content

The content should include but is not limited to:

- Calculation involving;
    - actual profit or loss, percentage profit or loss, cost price or selling price
    - actual discounts, percentage discount, initial or discounted price
    - valued added tax including GCT on good and services
    - currency conversion
- Solution of worded problems involving:
    - simple and compound interest – actual interest, percentage interest, time and accumulated balance
    - simple and compound depreciation/appreciation – actual depreciation/appreciation, percentage depreciation, initial value and depreciated/appreciated value of asset
- Performance/Calculation relating to hire purchase:
    - deposit and percentage deposit
    - balance with or without interest
    - duration
    - value of each installment
- Wages/emoluments
    - regular weekly wage
    - overtime pay
    - commission
    - personal tax allowance applicable
    - taxable income and tax payable
    - labour cost and analysis
- Observing/Detecting proficiency in the use of an electronic calculator:
    - observation
    - based on class work
    - in marking quizzes and tests

- Determination of rates;
    - mileage – miles per gallon
    - cost per mile
    - wage bill per week
    - rate applicable in arriving at – utility bills
- **Cost analysis:**
    - marginal cost
    - marginal revenue
    - break-even point
    - average cost and total cost

UNIT VIII – SOLVING QUADRATIC EQUATIONS 5 Hours

Specific Objective:

Upon completion this unit, students should be able to:

8.1 introduce the quadratic equation $ax^2 + b\,x + c = 0$ with roots $\alpha \; and \; \beta$ as the standard

8.2 second degree polynomial

8.3 state the condition for the equation to have real roots

8.4 categorize these roots

8.5 solve equations similar to the one above using various methods

8.6 form the quadratic equation given their roots or a relationship between their roots

Content

The content should include but is not limited to:

- Introducing the standard quadratic equation:
    - $ax^2 + b\,x + c = 0$ as the standard second degree polynomial
    - with roots to $\alpha \; and \; \beta$
- Stating the condition for the equation to have real roots:
    - the **discriminant $b^2 - 4ac \geqq o$**
- Categorization of roots:
    - coincident roots; $b^2 - 4ac = 0$
    - distinct roots; b2 -4ac > 0

- roots equal in magnitude opposite in signs; $b = 0$

- Solving quadratic equations based on:
  - factorization
  - quadratic formula
  - completing the square
  - implicit quadratic equations involving the moduli and non-linear simultaneous equations:
    1. linear and non-linear equations: $x + y = 5$; $x\ y = 6$
    2. $|ax + b| = c$
    3. $| ax + b| = |cx + d|$
- Forming quadratic equations from their roots
  - $(x - \alpha)(x - \beta) = 0$

UNIT IX – SOLVING SIMULTANEOUS EQUATIONS 6 Hours

Specific Objectives:

Students are competent when they are able to**:**

9.1 define simultaneous equations

9.2 recognize simultaneous equations

9.3 employ various methods to solve simultaneous equations

Content

The content should include but is not limited to:

- Definition of term
- Methods
  - Substitution
  - Elimination

CAPSTONE EXPERIENCE

The owner of a dilapidated three-bedroom house with two bathrooms and a kitchen is desirous of refurbishing same. The old rusting "zinc" sheetings are to be replaced by a more durable and attractive roof. The bathrooms and the kitchen fixtures will also be replaced. There are old but 'legible' building plans showing the plumbing and electrical conduits. The floor tiles are also

to be replaced.

The owner requires an estimate of the total cost to complete the job in its entirety.

1. provide an estimate for all fixtures and fittings, doors, roofing material, lumber, tiles, etc.
2. provide an estimate for the cost of the roofing
3. provide an estimate of the mason work required
4. provide an estimate of the cost of removing debris from the work site
5. provide an overall price for doing the job including labour together with a loading (for profit)

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INSTRUCTIONAL METHODS

- Lectures
- Demonstrations
- Discussions
- Simulations
- Project(s)
- Presentations

ASSESSMENT PROCEDURES

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**II**	Oral Assignment/presentations	7%
2	**IV**	Written Assignments	8%
3	**I,II,III**	Mid-Semester Test/Quizzes	15%
4	**V,VI,VII,VIII,XI**	Group Project	30%
5	**I-XI**	Final Assessment	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Campbell, E, (2007). *Pure Mathematics for CAPE* vol. 1: LMH Publishing
2. Smith, D. R., & Peterson, J. (2006). *Introductory Technical Mathematics* (5th ed.). Florence, KY: Delmar Cengage Learning
3. Trefzgar, E. J., & Gary, S. J., & Ewen, D. (2004). *Technical Mathematics* (2nd ed.). New Jersey, NJ: Prentice Hall

Websites

1. EBSCOhost database- https://www.**ebscohost**.com/
2. Springer E-Books- http://link.springer.com/

FACULTY OF COMPUTER and ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE CONSTUCTION SITE MANAGEMENT
COURSE NAME:	PRACTICING OCCUPATIONAL HEALTH AND SAFETY
COURSE CODE :	**CSMOCC104S1**
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3
PREREQUISITES:	NONE
YEAR/SEM.:	YEAR 1, SEMESTER 1
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course will cover all major safety and health principles and practices including personal safety, first aid, CPR, environmental issues, and handling of hazardous materials or substances at the workplace.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. understand local and international Occupational Safety and Health regulations (OSH).
2. demonstrate an understanding of the 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 and participate in occupational health and safety drills
6. use various types of fire extinguishers
7. apply basic first aid and CPR

8. maintain a healthy and safe working environment
9. conduct site assessments within the construction industry
10. detect and prevent hazards and hazardous situations
11. practice accident prevention
12. adhere to OHS Laws. Regulations and Policies
13. manage workplace and occupational risks
14. understand the effects of disease on a person (aged)
15. demonstrate nursing/care giving considerations in the geriatric environment

UNIT I – ADHERING TO OHS REQUIREMENTS 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 explain the importance of health and safety at the workplace
1.2 outline the history of health and safety at the workplace
1.3 research applicable local and international legislations/regulations affecting the work environment
1.4 identify causes of accidents and the types of hazards workers are exposed to at the workplace
1.5 outline procedures to prevent injury
1.6 write an accident report
1.7 demonstrate safety awareness and procedures that can prevent injury to self and colleagues
1.8 investigate how to access emergency services
1.9 determine employers' and employee's responsibilities towards safety
1.10 demonstrate safe work practices when using tools, equipment and materials/substances at work
1.11 apply correct techniques when lifting heavy objects
1.12 wear Personal Protective Equipment (PPE) in the working environment
1.13 adhere to OHS requirements, laws and regulations as applicable to construction site mangement
1.14 follow workplace and professional standards to maintain OHS Laws

Content:
The content should include but is not limited to:

- Health and safety – its importance for the work environment
- Brief history of OHS in the workplace
- Local and international law/regulations on OHS – Factories Regulation, ILO, WHO etc
- Causes of accidents and workplace hazards: chemical, biological, accidents etc
- General accident prevention measures
- Making an accident report
- Safety procedures to prevent injury to self and colleagues
- Accessing emergency services: fire, ambulance, natural disasters and other services
- Employers' responsibilities towards the management of safety in the workplace and Employees 'responsibilities.
- Safe working practices when using tools, equipment and consumable materials while working.
- Lifting techniques and safety gears
- Features of safe work and healthy work environment
- Geriatric requirements for OHS

UNIT II – FOLLOWING ELECTRICAL AND MECHANICAL EQUIPMENT SAFETY REQUIREMENTS 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1. identify electrical equipment and electrical hazards
2.2. Identify mechanical equipment hazards
2.3. use safety procedures with electrical equipment and electricity
2.4. apply safe electrical practices and operation at work
2.5. interpret electrical hazard safety signs correctly
2.6. demonstrate safe electrical installation of equipment, fixtures and appliances.
2.7. use first aid to treat electrical shocks
2.8. follow safety procedures in using geriatric procedures, tools and equipment

Content:
The content should include but is not limited to:

- Electrical equipment and electrical hazards
- Safety precautions when using electrical equipment and electricity
- Safe electrical practices and operations
- Electrical safety hazard signs
- Recognizing safe electrical installations of equipment, fixtures and appliances
- Treating electrical shocks – how to isolate an injured person and apply first aid.
- Geriatric tools, equipment and procedures

UNIT III – HANDLING HAZARDOUS MATERIALS/SUBSTANCES 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 identify various hazardous materials/substances related to the job or occupation
3.2 detect and prevent hazardous situations in the delivering geriatric care
3.3 recognize and explain the various hazard signs and symbols used in the workplace
3.4 demonstrate correct safety precautions and procedures when handling hazardous materials
3.5 practice personal hygiene, skin protection/care and use Personal Protective Equipment
3.6 handle and store hazardous materials/substances
3.7 describe the procedures for the proper handling and disposal of hazardous materials/substances
3.8 investigate the impacts of hazardous materials and substance on the human and natural environment
3.9 protect clients from hazardous materials and situations
3.10 report hazards and hazardous situations

Content:

The content should include but is not limited to:

- Types of hazardous materials/substances at the workplace: toxic materials, flammable, corrosive, explosive, fumes gases, radioactive etc.
- Hazard symbols and signage
- Correct safety precautions and procedures when using hazardous materials – flammable gases, acids etc.
- Personal Protective Equipment (PPE) and the role of personal hygiene at work
- Safe storage and handling of hazardous materials/substances
- Procedures for disposal of hazardous materials
- Environmental and human effects of hazardous materials and substances

UNIT IV – PRACTICING FIRE SAFETY AND HAZARDS MITIGATION 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 identify the types of fire hazards common to the work environment and fire hazards symbols

4.2 demonstrate the correct selection and use of fire extinguishing equipment

4.3 describe the proper location of fire extinguishing equipment at the workplace

4.4 demonstrate the correct procedures when extinguishing different types of fires at the workplace.

4.5 plan and participate in a fire drill in a lab-setting or a work environment and write a report on the activity.

4.6 describe the safety procedures and precautions used to handle and store flammable materials

4.7 explain the importance and use of an assembly point at the workplace

Content:

The content should include but is not limited to:

- Fire hazards at work and fire hazards symbols

- Fire extinguishers demonstration and selection and use of various types of fire extinguishers
- Proper fire extinguishers location at the workplace
- Correct procedures to use when approaching and extinguishing various types of fires
- Fire drills and Fire Drill Report: time; number of participants; fire drill plan, safety protocol etc
- Safety procedures and precautions in handling and storing of flammable materials
- Assembly points

UNIT V – ADMINISTERING FIRST AID AND CPR 12 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 explain the concept "first aid", CPR and the importance at the workplace (Geriatric Care)
5.2 outline the steps taken when an accident occurs
5.3 follow the ABC Assessment for first aid
5.4 demonstrate how to treat cuts and bruises with first aid (demonstration/simulation)
5.5 use a first aid kit and select an appropriate location for the kit
5.6 demonstrate the application of first aid and CPR to injured colleagues (Simulation)
5.7 identify various emergency services available in the work community
5.8 examine the role of having trained first-aider at the workplace
5.9 follow establish procedures to administer First Aid and CRP procedures to Clients/Colleagues
5.10 Take steps to acquire professional certification in First Aid and CPR
5.11 Assess the role of the Government Agencies, Professional Bodies in OHS compliance
5.12 Take responsibility for personal safety and safety of clients in one's own care

Content:

The content should include but is not limited to:

- First aid and its importance
- Steps to be taken when an accident occurs

- First aid – Airway, Breathing, and Circulatory assessments
- Treating cuts and bruises (simulation/demonstration)
- First Aid Kit – its location and use
- Administering first aid and CPR to the injured
- Emergency services in the work community – ambulance, fire, police, accident, natural disaster organizations etc
- Role of trained first-aider at the workplace
- Roles: Ministry of Labour, Labour Organizations, Nursing Council, Fire Brigade Service, Emergency, ODPEM
- Responsibility for personal safety

UNIT VI – PRACTICING ACCIDENT AND INJURY PREVENTION AND SAFETY 12 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

6.1 explain the general principles of accident and injury prevention

6.2 examine the role of OSH Committee in preventing injury at the workplace

6.3 investigate the types of safety and security issues that will affect employees, clients and the work environment

6.4 develop an occupational safety and health programme for a workplace of your choice (***Group Project consisting of three (3) students***)

6.5 evaluate workplace practices in order to identify hazards to clients, workers and the work environment

6.6 research an emergency preparedness plan for a workplace of your choice

6.7 assess a disaster preparedness plan for a workplace of your choice

6.8 describe how an emergency preparedness plan helps to prevent injury at the workplace

6.9 describe how to develop a safety culture in a work environment

6.10 maintain workplace occupational health and safety

6.11 participate in workplace safety procedures

6.12 maintain a safe, healthy, clean and productive work environment

6.13 contribute to the development of OHS policies, standards and procedures for the workplace and the profession.

Content:

The content should include but is not limited to:

- General principles of injury prevention: education, enforcement/enactment; engineering, economic incentives/penalties
- Role of OSH Committee: forum to discuss safety issues at work, recommendations regarding OHS
- Types of safety and security issues at work: health, confined space, slip, fall, fire, mal- functioning equipment, disgruntled customer/employee, human error etc
- OHS Programme for a selected workplace
- Workplace safety Audit
- Workplace Emergency Preparedness plan
- Workplace Preparedness Plan and injury prevention
- Safety Culture development at work: safety processes, procedure manual, education and training, safety laws, rewards, scheduled equipment maintenance, use of personal protective equipment, etc.

UNIT VII – CONDUCTING AN ASSESSMENT OF THE CONSTRUCTION SITE MANAGEMENT 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

7.1 explain the importance of assessing the construction environment

7.2 identify types of construction environment

7.3 identify range of clients/users interfacing with various construction sites

7.4 adhere to establish policies, standards and procedures to conduct assessment

7.5 conduct site assessments

7.6 analyse assessment findings

7.7 work as part of Construction Site Assessment Team

7.8 evaluate the factors to be considered in conducting site assessments

7.9 assess the importance of culture, ethnicity, class/status, diversity and education in conducting assessment of geriatric environment

Content:

The content should include but is not limited to:

- Environment: Homes, Nursing Homes, Infirmary, Public and Private Hospitals
- Factors to Consider: Stairs, Bathrooms (Bathing and Toileting), Medications, Predetermined wishes of elderly, Family situations, Nutrition and Cooking, Falls, Smoke detectors, Emergency Contacts, Utilities, Temperatures (Home and Water), Safety of Neighbourhood, Emergency Exists, Flooring, Financial Situations
- Impact of: Education, Status/Class, Diversity, Ethnicity, Culture
- Profile of Assessment Team
- Procedures for Assessment Conduct
- Analysis and Reporting Procedures

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I, II, III,**	Oral Assignment	20%
2	**IV, V**	Written Assignment	20%
3	**VI, VII**	Group Project	40%
4	**II**	Written	20%
Total			**100%**

FEEDBACK

- Students will be given rubrics and grading schemes within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

INSTRUCTIONAL METHODS:

1. Lectures
2. Demonstrations
3. Discussions
4. Group Work
5. Presentations
6. Guest Lecturers
7. Video Presentations
8. Research
9. Simulation
10. Role playing
11. Case Studies

RESOURCE:

Prescribed:

Goetsch; David L. (2011). *Occupational Safety and Health for Technologists, Engineers, and Managers, (7 Ed.)* Prentice Hall NJ

Recommended:

1. Benjamin, O., A. (2008) *Fundamental Principles of Occupational Health and Safety*, (2ed) International Labour Organization
2. Goold, G.(latest edition) *First Aid in the Workplace.* Prentice Hall NJ, USA
3. Koradecka, D.(2010) *Handbook of Occupational Safety and health*, CRC Publishers

Internet

International Labour Organization: Retrieved http://www.ilo.org/global/topics/safety-and-health-at-

Other online resources

https://www.ebscohost.com www.springerlink.com/books

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	PREPARING SITES AND CARRY OUT STEEL-FIXING
COURSE CODE:	CSMPSS105S1
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3 CREDITS
PREREQUISITES:	
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to give students knowledge, skills and attitudes to investigate construction sites, and setting out site for the erecting of buildings. It includes in-depth practical and theoretical knowledge of site preparation, soil testing, types of foundations, setting out, construction and installation of matting, wall bars and stiffeners as well as excavation of foundation trenches. It also exposes students to the process for installing fabricate steel cages to form foundations.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. analyze soil types and make a determination of the type of foundation recommended
2. demonstrate competencies in setting out of buildings, excavate and timber foundation's trench

3. demonstrate competencies in the construction and installation of steelwork
4. demonstrate an understanding in the evacuation of foundation trenches

UNIT I: INTRODUCING THE CONSTRUCTION INDUSTRY 4 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 identify the various professionals and tradesmen on a building team
1.2 describe the function of the various professionals and trade persons in the construction industry.
1.3 recognize various construction tools and their use in the construction industry
1.4 describe the overall construction projection process from conceptualization to implementation.
1.5 assess the benefit of the construction industry to the local and international economy.
1.6 evaluate the education and training needs for person within the construction industry

Content

The content should include but is not limited to:

- Construction Site Team
    - Types of tradesmen
        1. Electrician
        2. Block Laying
        3. Steel Fixing
        4. Plumber and etc.
- Roles and functions of each tradesmen
- Benefit of the construction industry to the local and international economy
    - Growth in GDP
    - Aiding in the growth of the tourism industry
    - transport networks – such as road, rail, airports and motorways
    - drainage – the provision of waste connections to houses, of and other commercial buildings like shops
    - provision of services – the supply of water, gas, electricity and communications to our houses and towns

- food defences – provision of defences to protect our buildings from flooding by rivers and rising sea levels.

- Construction Projection Process
- Construction Tools
    - Levelling Tools
    - Static Machines
    - Heavy duty machines

UNIT II: DEVELOPING AN ENVIRONMENTAL IMPACT ASSESSMENT REPORT 4 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 state what is an environmental impact assessment

2.2 assess the importance of performing an environmental impact assessment of the site before construction

2.3 produce a report of an environmental impact assessment of a site

2.4 discuss the importance of the National Environmental and Planning Agency throughout the construction process

Content

The content should include but is not limited to:

- Definition of term
- Importance of an environmental impact assessment
- Factors to consider when preparing an environmental impact assessment

UNIT III: PREPARING THE CONSTRUCTION SITE 8 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 analyze factors affecting choice of site (accessibility, cost, topography etc.)

3.2 differentiate between stripping and site clearance of a site

3.3 evaluate the importance of stripping a construction site

3.4 organize the stripping of a construction site

3.5 examine the various types of soils

3.6 perform a soil test on a sample of soil from a construction site

3.7 define the term “setting out”

3.8 assess the processes involved in “setting out”

3.9 carry out “setting out” for an irregular shape building on a construction site

3.10 evaluate various levelling techniques

3.11 discuss various types of temporary structures

Content

The content should include but is not limited to:

- Setting Out
- Hoarding and Fencing
- Site Clearance
- Soil testing
- Temporary structures
    - Temporary site shelter
    - Formwork
- Soil topography
- Levelling techniques

UNIT IV: CREATING FOUNDATIONS FOR STRUCTURES 8 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 evaluate the types of foundations and their uses

4.2 use guiding principles in preparing a construction site for foundation

4.3 assess factors affecting foundations

4.4 discuss various methods for excavating foundation trenches

Content

The content should include but is not limited to:

- Types of Foundations
    - Shallow foundation
        1. Individual footing or isolated footing
        2. Combined footing
        3. Strip foundation
        4. Raft or mat foundation
    - Deep Foundation
        1. Pile foundation
        2. Drilled Shafts or caissons
- Factors affecting foundations
    - Tree Roots
    - Water Pipes
    - Sewage Pipes
    - Electricity and Gas
- Excavation
    - Stability of excavations
    - Protecting excavations from workers
    - Dewatering excavations
    - Equipment and Machines necessary for excavating and lifting
    - Rock Excavation

UNIT V: INSTALLING MATTING, WALLS, AND STIFFENERS 8 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 define Mono-Strand Post Tensioning as it relates to the construction industry

5.2 define Stress Bar Post Tensioning as it relates to the construction industry

5.3 employ the use of Mono-Strand Post Tensioning and Stress Bar Post Tensioning in construction

5.4 examine the Manual Metal Arc Welding Process (MMAW) used in the construction industry

5.5 construct segmental profile board

5.6 construct continuous profile board

5.7 construct reinforcement for foundations

Content

The content should include but is not limited to:

- Construction of matting cage
- Construction of stiffeners cage
- Fabrication of wall bars
- Offset
- Fabrication of stirrups
- Fabrication of links
- Construction of beam cage
- Construction of belt beam
- Fabrication of reinforcement for roof slab
- Setting out of buildings
- Construction of profile board
- Types of steel bars
- Sizes of steel bars

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INSTRUCTIONAL METHODS

1. Lectures
2. Demonstrations
3. Discussions
4. Group Work
5. Presentations
6. Guest Lecturers
7. Video Presentations

8. Research
9. Simulation
10. Role playing
11. Case Studies

ASSESSMENT PROCEDURES

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**II**	Oral Assignment	20%
2	**I**	Written Assignment	20%
3	**III,IV,V**	Group Project	40%
4	**III**	Written	20%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Jackson, B., J. *Construction Management JumpStart: The Best First Step Toward a Career in Construction Management 2nd Edition*
2. Chang, G. (2012). *Building Construction: Project Management, Construction Administration, Drawings, Specs, Detailing Tips, Schedules, Checklists, and Secrets Others Don't Tell You: Architectural Practice Simplified*.

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN RENEWABLE ENERGY TECHNOLOGY
COURSE NAME:	PREPARING GEOMETRIC DRAWINGS AND SKECTHES
COURSE CODE:	**CSMPDR106S1**
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3
PREREQUISITES:	NONE
YEAR/SEM.:	YEAR 1, SEMESTER 1
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to enable students to develop the requisite knowledge, skills and attitudes to communicate effectively in the engineering field using drafting skills. It is designed to equip students with basic graphic communication skills, to operate at the industry standard and so enable them to interpret designs of engineers. They will also be able to convey their own ideas graphically, using these skills in many ways; and at the level that it is accurately understood by the engineering team, and to a lesser extent by the end users of related products and services. Occupational Health and Safety (OHS) will be aligned to each component of the drawing process and the student will be guided on how OHS should be planned and designed for in the executing of the drafting process.

LEARNER OUTCOME AND INSTRUCTIONAL OBJECTIVE

Upon completion of this course, students are competent when they are able to:

1. use drafting concepts and principles
2. use drafting instruments

3. work as part of the project design team
4. interpret drafting instructions
5. prepare drawings to Specifications

UNIT I – APPLICATION OF DRAWING PRINCIPLES 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 identify types of drawings

1.2 classify types of drawings and explain their purpose

1.3 identify drawing forms: units, formats, sheet sizes

1.4 apply various types of drawing routines

Content

The content should include but is not limited to:

- Types of drawings
- Purpose & classification of drawings
- Drawing forms
    - sheet size and format
    - metric
    - imperial
    - copy fold information
- Drawing routines
    - Signatures
    - Approvals
    - Dates
    - Numbers and Numbering systems
    - Design considerations/specifications
    - Materials or component specifications
    - Lists
    - Titles
    - Proprietary information
    - Fasteners

- Representations
- Notes
- Charts and graphs
- Modifications and revision conventions

UNIT II – APPLYING SCIENCE, TECHNOLOGY, ENGINEERING AND MATH PRINCIPLES AND CONCEPTS 12 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 apply various concepts of Science Technology Engineering and Mathematics (STEM) to drawing activities

2.2 identify various drafting documentations

2.3 use line conventions and lettering on sectional, pictorial and engineering drawings

2.4 use the appropriate measurements on various drawings

2.5 insert various borders and blocks suitable for drawing type

2.6 construct geometric shapes and reproduce given drawings

2.7 reproduce drawings of various structures within the construction industry

Content

The content should include but is not limited to:

- Fundamentals of drafting documentation including contents, version control, indexing and product identification (e.g. Logo, trademark, software warning plates)
- Line types and weights
- Delineation: line conventions and lettering; multi- and sectional view drawings; pictorial drawings, types and application of engineering drawings, conventional representations, microfilming; descriptive geometry and revolutions
- Measurements: types, forms, units, symbols, reading and transfer
- Basic drawing layout (e.g. borders and information blocks)
- Geometric construction principles
- Usage of reproducible drawings with mechanical pencils

UNIT III – AUXILIARY VIEWS 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1. apply the principles, terms and conventions used in auxiliary views

3.2. use both primary and secondary views construction

3.3. draw auxiliary views of objects

Content

The content should include but is not limited to:

- Principles, terms and conventions usage in auxiliary views
- Use and application of auxiliary views
- Primary auxiliary view construction
- Secondary auxiliary view construction

UNIT IV – APPLY DESCRIPTIVE GEOMETRY/REVOLUTIONS 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 apply principles, terms and conventions used in descriptive geometry/revolutions

4.2 draw graphical solutions of points, lines and planes

4.3 draw graphical solutions of intersections (e.g. lines, planes and solids)

4.4 draw true lengths of lines, bearing and slope of lines

4.5 draw graphic solution of solids

4.6 perform drawings and constructions using the revolution method

Content

The content should include but is not limited to:

- Use of principles, terms and conventions in descriptive geometry/revolutions
- Graphic solutions of points, lines and planes
- Graphic solutions of intersections (e.g. lines, planes, and solids)
- True length of lines, bearing, and slope of lines
- Graphic solutions of solids
- Drawings construction using the revolution method

UNIT V – APPLY SECTIONAL VIEWS/CONVENTIONS 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 apply the principles, terms, symbols and conventions of sectional views

5.2 determine the use and application of sectional views, conventional breaks and cutting planes

5.3 draw standard sectional views

5.4 sketch symbols used to represent different materials

Content

The content should include but is not limited to:

- Principles, terms, symbols and conventions of sectional views
- Use and application of sectional views
- Drawing standard sectional views
- Use of conventional breaks
- Symbols used to represent different materials
- Use of cutting plans

UNIT VI – DIMENSIONING/SIZE DESCRIPTION AND TOLERANCE AS APPLIED TO DRAFTING 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

6.1 apply the principles, terms, symbols and conventions used in dimensioning and for tolerances

6.2 insert appropriate dimensions on relevant drawings

6.3 apply different dimensioning techniques

6.4 identify the various tolerances and apply them to the relevant drawings

6.5 use formula for positional tolerances

6.6 use dimensioning verification requirements

6.7 use form, orientation, profile and run out

Content

The content should include but is not limited to:

- Principles, terms, symbols and conventions used in dimensioning and for tolerance

- Terms, conventions and codes related to dimensioning
- Dimensioning drawing construction using international standards
- Types and usage techniques of dimensioning
- Application of dimensioning to object drawings
- Geometric dimensioning and tolerances
- Lines used in dimension drawings construction
- Dimensioning practices applications
- Dual dimensioning
- Tolerance applications
- Dimensioning verification requirements
- Formulas for positional tolerances
- Form, orientation, profile and run out

UNIT VII – DEVELOPMENT OF LAYOUTS FOR VARIOUS SHAPED OBJECTS

6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

7.1 apply the principles and concepts of development layouts of various shaped objects

7.2 identify terms, conventions and codes related to surface developments

7.3 use industry standards of surface development use

7.4 construct models for checking accuracy

7.5 use rules associated with surface developments to produce stretch outs

Content

The content should include but is not limited to:

- Principals and concepts of development layouts of various shaped objects
- Terms, conventions and codes related to surface developments
- Surface developments use in industry standards
- Basic three dimensional geometric shapes visualization in a two dimensional plane
- Cut out and construct models for checking accuracy
- Rules of surface developments to produce stretch outs

UNIT VIII – LAYOUT DRAWINGS PRODUCTION TO INDUSTRY STANDARDS

6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

8.1 use the principles, concepts and applications of layout drawings

8.2 use terms conventions and codes related to layout drawings

8.3 differentiate layout drawing types

8.4 apply the rules for layout drawings

8.5 interpret the concepts of units of measurement usage related to layout drawings

Content

The content should include but is not limited to:

- Principals, concepts and applications of layout drawings
- Terms, conventions and codes related to layout drawings
- Layout drawings types and differences
- Rules for layout drawings
- Concepts of units of measurement usage related to layout drawings

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ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I, II, III,**	Oral Assignment	20%
2	**IV, V**	Written Assignment	20%

3	**VI, VII, VIII**	Group Project	40%
4	**VIII**	Written	20%
Total			**100%**

INSTRUCTIONAL METHODS

- Practical Demonstrations

RESOURCES

1. Drawings instruments, sample drawings, model of different sectional views, video, drawing papers
2. Giescke, E. F., Mitchell, A., Spencer, C. H., Hill, L. I., Dygdon, T. J., Novak, E. J., & Lockhart, D. S. (2008). *Technical Drawing* (13th ed.). New Jersey, NJ: Prentice Hall
3. Goetsch, D. L.; Nelson, J. & Chalk, W. S. [2000]. *Technical Drawing*. McMillan Press.
4. Nelson, A. J., Goetsch, E. D., Rickman, L. R., & Chalk, S. W. (2008). *Technical Drawing and Engineering Communication* (6th ed.). Florence, KY: Delmar Cengage Learning

Websites:

1. EBSCOhost database- https://www.**ebscohost**.com/
2. Springer E-Books- http://www.**link.springer**.com/

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	PROVIDING QUALITY CUSTOMER SERVICE
COURSE CODE:	CSMCUS107S1
COURSE HOURS:	30 HOURS
CREDIT VALUE:	2 CREDITS
PREREQUISITES:	
YEAR/SEM.:	YEAR 1, SEMESTER 1
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to enable students to develop the requisite knowledge, skills and attitudes to provide good customer service. It focuses on developing awareness of the importance of customer service to the success of construction industry, building and maintaining customer loyalty, dealing with difficult customers, presenting a professional image and participating in teamwork.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course students are competent when they are able to: create an appreciation of the importance of quality customer care for customers (internal and external) assist in improving quality customer service techniques, develop attitudes to provide quality service delivery, create and add value and respect people at all levels of the organization, management and customers.

Upon successful completion of this course, students are competent when they are able to:

1. understand the importance of customer service to the business
2. explain the ways in which customer standards improve the quality of service
3. demonstrate interpersonal skills necessary for the delivery of quality customer service
4. apply conflict resolution techniques
5. solve customer complaints
6. follow professional codes of conduct to enhancement of quality customer care
7. interpret and follow customer service policies
8. provide quality customer service

UNIT I - DEVELOPING KNOWLEDGE OF THE CUSTOMER 6 Hours

Specific Objectives

Upon successful completion of this unit, students are competent when they are able to:

1.1 provide excellent customer service
1.2 handle different types of customers
1.3 distinguish between internal and external customers
1.4 identify the fundamental needs of customers
1.5 determine the major factors customers use to "RATE" service quality
1.6 identify components of the customer's "Bill of Rights"
1.7 determine the characteristics of the types of customers
1.8 use customer profile to address particular needs

Content

The content should include but is not limited to:

- Characteristics of quality customer service
- Identify mediocre customer service
- Types of customers and their characteristics/profiles
- Internal vs. external customers
- Fundamental needs of customers
- Major factors used to RATE service quality

- Customers' "Bill of Rights"

UNIT II - DEVELOPING CUSTOMER LOYALTY 9 Hours

Specific Objectives

Upon successful completion of this unit, students are competent when they able to:

2.1 define the term "customer loyalty"
2.2 listen to and address the customer's concerns
2.3 follow the processes and procedures in delivering quality customer service
2.4 explain the impact of "total quality focus" on customer loyalty
2.5 apply proactive approaches to build customer loyalty
2.6 explain how customer loyalty impacts the organizations' development and profitability

Contents

The content should include but is not limited to:

- Total quality focus
- Definition of customer loyalty
- Total quality focus
- Proactive approaches to customer contact
- Impact on customer loyalty

UNIT III - PRACTICING GOOD ATTITUDES AND HABITS FOR CUSTOMER SERVICE 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 determine the effects of poor "attitude" on quality customer service
3.2 develop effective habits and attitudes towards quality service
3.3 explain the advantages of good attitudes
3.4 follow approved procedures for interacting with customers

3.5 provide service to customers that builds repeat business

Content

The content should include but is not limited to:

- Definition of "attitude"
- Definition of "habit"
- Characteristics of positive and negative attitudes
- Behaviour patterns impacting quality customer service
- Advantages of a good attitude
    - the service provider
    - the customers
    - the organization
- Body language
- Factors affecting customers' loss

UNIT IV – DEALING WITH DIFFICULT CUSTOMERS 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 identify major reasons why customers get upset/make complaints
4.2 apply procedures to deal with types of difficult customers
4.3 analyse outcomes from the service encounter with difficult customers
4.4 explain the conceptual framework of service recovery and fallout
4.5 implement strategies to address customer dissatisfaction/service recovery and fallout
4.6 follow approved procedures to handle customers' complaints
4.7 distinguish between "listening" and "hearing"
4.8 explain the importance of listening to customers in the delivery of quality customer service
4.9 apply steps to listening to and provide feedback to customers
4.10 identify the strategies for effective listening/active listening
4.11 use the seven-step (7-step) Customer Complaints Resolution Model
4.12 refer unresolved issues with difficult customers to appropriate authority level

Content

The content should include but is not limited to:

- Dissatisfied customers
- Difficult customers
- Service encounter
- Service recovery and fallout procedures
- Strategies addressing customer dissatisfaction, service recovery and fallout
- Handling customer complaints
- Listening vs. hearing
- Importance of listening to difficult customers
- Good listening skills

UNIT V- DEVELOP AND PROJECT PROFESSIONAL IMAGE 6 Hours

Specific Objective

Upon successful completion of this unit, students are competent when they are able to:

5.1 interpret the term "professionalism"
5.2 demonstrate professionalism at the workplace and off the job
5.3 acquire opportunities to improve and maintain professional competencies
5.4 apply guidelines to develop professionalism at the workplace
5.5 encourage and support the professional development of staff and other colleagues
5.6 participate in professional development activities of the organization
5.7 join and participate in professional organization
5.8 read professional publications to update industry knowledge
5.9 acquire and maintain professional certifications

Content

The content should include but is not limited to:

- Definition of "professionalism"

- Professional Organizations
- Professional development organizations and opportunities
- Professionalism at work
- Delivering professional services
- Professional Publications
- Strategies for providing professional services
- Professional Certifications

UNIT VI – PARTICIPATE IN TEAMWORK 6 Hours

Specific Objectives

Upon successful completion of this unit, students are competent when they able to:

6.1 lead and develop work teams
6.2 explain the role of teamwork in attaining organization's goals
6.3 identify the advantages of teamwork
6.4 explain the disadvantages of poor teamwork
6.5 identify the components of great teamwork
6.6 use teamwork in the delivery of quality customer care

Content

The content should include but is not limited to:

- Definition of "teamwork"
- The role of teamwork in building relations
- Advantages and disadvantages of teamwork
- Components of great teamwork
- Importance of teamwork in the delivery of customer care
- Traits of a good team leader

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ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending class, completing assigned work, and complying with existing copyright legislations.

To successfully complete this courses, students must pass ALL of the different components of course assessments (test, case studies, projects, capstone assignments, projects, presentations) meeting the minimum pass mark requirements.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**IV**	Oral Assignment	20%
2	**II**	Written Assignment	20%
3	**II, III , IV, V,VI**	Group Project	40%
4	**I**	Written	20%
Total			**100%**

FEEDBACK

Students will be given rubrics and grading schemes within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be document on assessment evidence.

INSTRUCTIONAL METHODS

This course will be taught using a combination of formal lectures, discussions, role play, case studies and presentations.

RESOURCES

1. Henry, B. *Quality Customer Care for the Caribbean*
2. Bennett, K. (2010) *Starting a business in Jamaica*
3. Williams, S. (2006) *The financial times guide to business start-up*. Pearson Education: UK

4. Zimmerer T., Scarborough N. (2007). *Essentials of entrepreneurship and small business management* (5th ed.). NJ: Prentice Hall.

COURSE OUTLINES

Year 1 Semester 2

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	USING COMMUNICATION SKILLS II
COURSE CODE:	**GCCOM108S2**
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3
PREREQUISITES:	NONE
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course aims to enhance students' communicative competence in the world of work. It includes a detailed look at the communication process, examining the intricacies of technical writing and promotes critical thinking skills that will allow the students to engage in informative discourse that would be beneficial to their field of expertise and by extension the wider society.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES:

Upon completion of this course, students competent when they are able to:

1. communicates clearly, concisely and correctly within the requirements of the environment and context
2. responds to written, spoken or visual messages in a manner that ensures effective communication
3. makes independent choices and solves routine communication problems with keen attention to ethical practices
4. demonstrates tolerance and temperance when interacting with others
5. empathizes and makes informed decisions

UNIT I: USE ORGANIZATION'S COMMUNICATION SYSTEMS 15 Hours

Specific Objectives:

Upon completion of this unit, students are competent when they are able to:

1.1. explain the importance of ethical behavior in communicating
1.2. assess own role in workplace communication
1.3. explain the importance of communication flow within an organization
1.4. demonstrate sensitivity to diverse audience when communicating
1.5. use communication systems and procedures
1.6. interpret communication policies

Content

The content should include but is not limited to:

- Copyright /intellectual property (digital, print, audio)
- Use of company property for personal use (photocopier, printer, computer, phone, stationery, social media accounts etc.)
- Collection, storage, retrieval and disposal of confidential information
- Interpersonal abuse (physical violence, sexual harassment, emotional abuse, abuse of one's position, racism, and sexism)
- External communication – purpose, advantages and disadvantages of (Networking, negotiating, sharing of ideas)
- Internal communication – purpose, advantages and disadvantages of (Hierarchy, downward flow, upward flow, lateral/horizontal communication, diagonal communication, grapevine/informal communication)
- The rights of individual/groups to religious, ethnic, political, and cultural beliefs and practices
- The rights of disabled individuals/groups in the workplace
- The effects of discrimination in the workplace (gender, age, education, social status, sexual orientation)
- The advantages and disadvantages of diversity in the workplace

UNIT II: BUILD PROFESSIONAL IMAGE 3 Hours

Specific Objectives:

Upon completion of this unit, students are competent when they are able to:

2.1. explain the importance of building professional image

2.2. justify the need for maintaining a professional image

2.3. adhere to work place etiquette

2.4. maintain professionalism

2.5. pursue personal development

Content

To include but not limited to:

- Work place etiquette – (the opening of a door for somebody, waiting for someone to come out of an elevator before going in, social etiquette etc), managing your emotions
- Professionalism - Tattoos, adornments, inappropriate dressing, grooming, inappropriate conversation, conduct when representing the organization
- Personal Development

UNIT III: PREPARE BUSINESS DOCUMENTS 2 Hours

Specific Objectives:

Upon completion of this unit, students are competent when they are able to:

3.1. produce quality written information

3.2. complete commonly used business forms

Content:

The content should include but is not limited to:

- Reports (accident, technical), letters (request, complaint, apology, job application), e-mails, Forms, notices, schedules, logs used in the related industry

UNIT IV: Prepare Correspondences for Meetings 6 Hours

Specific Objectives:

Upon completion of this unit, students are competent when they are able to:

4.1. produce documents for business meetings

4.2. conduct a business meeting

Content:

The content should include but is not limited to:

- Memo, agenda, minutes
- Action plan

UNIT V: COMMUNICATE ORAL **9 Hours**

Specific Objectives:

Upon completion of this unit, students are competent when they are able to:

5.1. conduct professional presentation

5.2. communicate effectively

Content

The content should include but is not limited to:

- Tone, intonation, pitch, rhythm, body language, attire, etc.
- Important elements of public speaking.
    - Audience analysis
    - Presentation purpose
    - Language correctness
    - Stage presence
    - Proper use of stage & props

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ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To

successfully complete this course, a student must pass **ALL** the different components of the course.

Course Work 40%
Practical 20%
Theory Work 40%

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1		Two in-course tests	20%
2		Practical Assignments/Projects	20%
3		Field/Laboratory/Practical Activities	40%
4		End of Semester Examination	20%
Total			**100%**

FEEDBACK

Students will be given rubrics and grading schemes within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

INSTRUCTIONAL METHODS

This course will be taught using a combination of:

- Formal lectures
- Discussions
- Geriatric Care Facilities
- Presentations.

RESOURCES

1. Zeuschner, R. (2003). *Communicating Today: The Essentials*. California State University Pearson Education, Inc.
2. Verlinden, J., W (2005). *Critical Thinking and Everyday Argument*. Cengage learning

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN RENEWABLE ENERGY TECHNOLOGY
COURSE NAME:	PERFORMING MATHEMATICS FOR CONSTRUCTION SITE MANAGEMENT II
COURSE CODE:	
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3
PREREQUISITES:	PERFORMING MATHEMATICS FOR CONSTRUCTION SITE MANAGEMENT I
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed as a continuation to Performing Mathematics for Construction Site Management I which equipped students with the necessary mathematical foundation. Performing Mathematics for Construction Site Management II is aimed at improving and refining the mathematical techniques (concepts and skills) needed in a demanding engineering field. It is, therefore, imperative that matrices culminating with the solution of simultaneous equations, calculus – both differential and integral, and inventory control be included primarily for solving practical problems. As is customary, students are given further opportunities to hone their problem solving skills in resolving some of challenges posed in practical situations. The projects designed in this course is in furtherance of this aim.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. perform calculation pertaining to sequences and series
2. apply optimization techniques in inventory systems
3. develop competencies in indices and logarithm
4. solve problems using further trigonometry
5. calculate average rate of change
6. perform differentiation by rules
7. perform integration
8. apply Differentiation and Integration to solving practical problems

UNIT I – PERFORMING CALCULATIONS INVOLVING SEQUENCES AND SERIES 7 Hours

Specific Objective:

Upon completion this unit, students are competent when they are able to able to:

1.1 define terms sequences and series

1.2 categorize sequences into converging, diverging and alternating

1.3 write the nth term of a series and their sums

1.4 express the partial sum of an infinite series and test for convergence

1.5 determine the first term, common difference or common ratio and sum of an arithmetic or and geometric series respectively

1.6 calculate the sum to infinity of a geometric series

Content

The content should include but is not limited to:

- Definition of terms used
- Classification of sequences into:
    - converging
    - diverging
    - alternating
- Finding the limit of sequences:
    - testing for convergence

- upper bound

- Determination/Calculation of:
  - the first term and common difference for arithmetic series (or progression)
  - the first term or common ratio for geometric series (or progression)
  - the nth term, number of terms, and partial sums and sums (including sums to infinity)
- Practical applications in business

UNIT II: OPTIMIZING QUANTITIES IN INVENTORY SYSTEMS 8 Hours

Specific Objectives:

Upon completion of this unit, students are competent when they are able to:

2.1 recognize the two traditional inventory systems

2.2 discuss the basic EOQ model and the BOQ model

2.3 demonstrate the optimizing effect of the EOQ on an inventory system

2.4 discuss the costs associated with inventory systems

2.5 calculating the EOQ and the BOQ together with other parameters and costs

2.6 consider the effect of discounts on optimization (minimization) of total cost

Content

The content should include but is not limited to:

- Recognition of traditional systems:
  - the periodic review system
  - the economic order quantity system
- Discussion of
  - the basic EOQ model using a graphical approach
  - the costs associated with inventory systems
- Demonstrating the optimizing effect of the EOQ and/or BOQ:
  - graphically and/or in
  - tabular form
- Calculation of the economic order quantities and other parameters and costs
  - without discounts
  - with discounts

UNIT III – DEVELOPING COMPETENCES IN INDICES AND LOGARITHM 10 Hours

Specific Objective:

Upon completion this unit, students should be able to:

3.1 define terms indices and logarithm

3.2 represent numbers and terms in index form and as logarithm

3.3 express the rules of indices and logarithm

3.4 evaluate the numbers using indices and/or logarithm

3.5 change of base in indices and/or logarithm

3.6 simplify terms and expressions using indices or logarithm

3.7 solving equations using indices and/or logarithm

Content

The content should include but is not limited to:

- definition of terms
  - indices
  - logarithms
- Representation in:
  - index or exponential form a^x
  - logarithmic form $\log_{10}x$ or $\log_e y$
- Evaluation of number or terms using:
  - indices
  - logarithm
- Changing the base of:
  - indices: $a^x = e^{x\log_e a}$
  - $\log_a b = \frac{1}{\log_b a}; \log_a b = \frac{\log_c b}{\log_c a}$
- Simplification of terms or expression:
  - indices
  - logarithm
- Solving equations using:
  - indices

- logarithm
- both of the above

UNIT IV – SOLVING PROBLEMS INVOLVING FURTHER TRIGONOMETRY

10 Hours

Specific Objective:

Upon completion this unit, students should be able to:

4.1 define terms used

4.2 compute the six trigonometrical ratios based on right-angled triangles

4.3 solve problems involving the Sine Rule and Cosine Rule

4.4 compute the circumference, arcs length, perimeters and areas of circles, sectors, segment and annulus of a circle

4.5 quote trigonometric identities such as the Pythagorean, compound angles, double - angles, product-sum formulae

4.6 prove trigonometric identities

4.7 solve trigonometric equations for solutions in degrees and radians as well as their general solutions

4.8 evaluate small angles

Content

The content should include but is not limited to:

- Definition of the terms used
- Computation/Evaluation of the trigonometric ratios:
  - Pythagoras' Theorem: $(\text{hypotenuse})^2 = (\text{adjacent})^2 + (\text{opposite})^2$
  - cos x, sin x tan x, cot x, cosec x, sec x
  - compound angles without calculator or tables
  - inverse trigonometric functions: $\sin^{-1} x$, etc.
- Solution/Calculation for:
  - arc lengths
  - circumference/perimeter
  - areas of sectors, segments, circles and annulus of circles
  - trigonometric equation:

1. $\sin 2x = \frac{3}{4}$; $\cot(x - 45^0) = \cos 65^0$
2. $a \sin x + b \cos x = c$
3. general solutions in degrees and radians

- Quoting/Proving trigonometric identities
  - Pythagorean identities
  - compound angles (sum and difference)
  - double angles
  - sum/difference-product formulae
- Evaluation of small angles for: $\sin x \approx x; \cos x \approx 1 - \frac{x^2}{2}; \tan x \approx x$

UNIT V – CALCULATING AVERAGE RATE OF CHANGE 4 Hours

Specific Objective:

Upon completion this unit, students are competent when they are able to:

5.1 define the term(s) used

5.2 calculate average rate of change for continuous functions over an interval

5.3 solve problems in business, economics and science using the average rate of change

Content

The content should include but is not limited to:

- Definition of terms used
- Calculation of:
  - average rate of change on an interval $[x_o, x_1] = \frac{f(x_1) - f(x_o)}{x_1 - x_o}$
  - average rate of change in business (average cost, $\bar{C}$ (q), average revenue, $\bar{r}(q)$)
  - average rate of change in science (velocity, acceleration, etc.)
- Solution by:
  - solving problems in business and economics
  - solving problems in science

UNIT VI – PERFORMING DIFFERENTIATION BY RULES 9 Hours

Specific Objective:

Upon completion this unit, students should be able to:

6.1 define terms used

6.2 differentiate single variable functions: polynomials, rational, trigonometric, exponential, logarithmic and mixed functions

6.3 differentiate the functions above using the rules of differentiation

6.4 extend differentiation to second and higher orders including Leibnitz Theorem

6.5 apply Mean Value Theorem to solving problems

Content

The content should include but is not limited to:

- Definition of terms used
- Differentiation of:
  - single variable functions
  - polynomial; rational function; trigonometric functions; exponential; logarithmic
  - rules of differentiation
  - simple rules ($\frac{dy}{dx}$; if $y = c$, $y = x^n$, $y = kx^n$);
  - composite rules
  - higher order differentiation
  - second order and above; Leibnitz Theorem

- Application of/to:
  - theorem(s) on single valued functions – the Mean Value Theorem
  - sketching of curves
  - optimization – maximum; minimum; point of inflexion

UNIT VII – PERFORM INTEGRATION (ANTI-DERIVATIVE) 11 Hours

Specific Objective:

Upon completion this unit, students should be able to:

7.1 define terms used

7.2 discuss The Fundamental Theorem of Calculus

7.3 recognize the integral as the anti-derivative of a function

7.4 determine indefinite integral of polynomial, rational, composite and mixed functions

7.5 integrate the functions above by simple rules and substitution

7.6 determine the integrals of trigonometric functions using trigonometric techniques and identities

7.7 evaluate definite integrals

7.8 evaluate the area under a curve as well as the area between two curves

7.9 compute volumes of revolution for plane curves about both axes

7.10 compute arc lengths and surface areas of revolution

7.11 use numerical integration as an approximation to definite integrals with appropriate errors bounds (trapezium rule)

7.12 apply integration to problems in business, economics, physics and engineering

Content:

The content should include but is not limited to:

- Definition of the terms used
- Recognition/Discussion of:
    - The Fundamental Theorem of Calculus
    - An integral as an anti-derivative
- Integration of/by:
    - simple rules; substitution; trigonometric techniques
    - single–valued functions: polynomials; rational function with partial fractions; trigonometric**;** exponential and logarithmic functions
    - single-valued function
    - indefinite integral
- Evaluation of:
    - integrals using trapezium rule with error bound
    - definite integrals: $I = \int_a^b f(x)dx$

- areas under curves

- Calculation of:
  - arc length
  - surface area of revolution
  - volume of revolution
- Practical applications to problems in:
  - business economics
  - engineering and physics

CAPSTONE EXPERIENCE

Projects designed to minimize cost and/or maximize revenue using:

1. calculus – differentiation and/or integration
2. inventory control measures
3. other methods/principles involving the mathematics topics from within the course outline herein

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INSTRUCTIONAL METHODS

- Lectures
- Demonstrations
- Discussions
- Simulations
- Project(s)
- Presentations

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I, II, III,**	Oral Assignment	20%
2	**IV, V**	Written Assignment	20%
3	**VI, VII, VIII**	Group Project	40%
4	**IX, X**	Written	20%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Campbell, E, (2007). *Pure Mathematics for CAPE* vol. 1 LMH Publishing
2. Smith, D. R., & Peterson, J. (2006). *Introductory Technical Mathematics* (5th ed.). Florence, KY: Delmar Cengage Learning
3. Trefzgar, E. J., & Gary, S. J., & Ewen, D. (2004). *Technical Mathematics* (2nd ed.). New Jersey, NJ: Prentice Hall

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	USING DRAWING TECHNOLOGIES 1 (AUTOCAD)
COURSE CODE:	
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3 CREDITS
PREREQUISITES:	PREPARING GEOMETRIC DRAWINGS AND SKETCHES
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course introduces the students to the CAD system and teaches the fundamental principles of AutoCAD that is essential in today's job market. The course will equip students with the basics technical drafting techniques to computer generated drawings of the various drafting disciplines. As a result of this students will achieve a high level of competence in performing practical tasks related to architectural drawings and will be able to exercise these skills in the building industry.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. demonstrate an understanding of the concept of ergonomic
2. understand the concept of layering
3. demonstrate knowledge of how to drawing in AutoCAD
4. understand repetitive symbols as block and wblock
5. demonstrate an understanding of how to inquire for data in a drawing
6. prepare construction drawings using AutoCAD

UNIT I – RECOGNIZING ERGONOMICS & COMPUTER BASICS 7 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 describe ergonomic problems relating to computer work stations

1.2 state precautions (electrical and mechanical) that should be observed when using computer equipment for CAD

1.3 perform safety and ergonomics requirements for performing computer aided drawings

1.4 identify the parts of the AutoCAD window

1.5 demonstrate the ability to setup drawing environment

1.6 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]

1.7 explain the different types of coordinate methods

1.8 use coordinate systems with basic commands

Content

The content should include but is not limited to:

- Electrical and Mechanical precautions when using computer equipment for CAD
- Safety and Ergonomic requirements when performing computer aided drawing (CAD)
- Parts of the AutoCAD Window
- Types of Coordinate Methods

UNIT II – PERFORMING BASIC DRAWING & EDITING COMMANDS 8 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 produce simple line drawings

2.2 draw shapes and geometries

2.3 manipulate, edit and change drawings

2.4 select objects for editing

2.5 view drawings produced

Content

The content should include but is not limited to:

- Produce simple line drawings o Line, rectangle, polygon, circle o Using object snaps
- Draw shapes and geometries
    - Polyline,
- Manipulate, edit and change drawings
    - Trim, erase, undo, fillet, chamfer, extend, offset, fillet-radius, mirror, rotate, move, copy, scale
- Select objects for editing
    - Pointing, crossing window, fence, add & remove select
    - Editing with grips
- View drawings produced
    - zoom, pan

UNIT III – EXECUTING ADVANCE DRAWING & EDITING IN AUTOCAD 10 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 explain the concept of layering

3.2 produce construction drawings efficiently and precisely

3.3 create window and door openings

3.4 insert symbols from Design Center and Tool Palette

3.5 create and insert BLOCKS and WBLOCKS Windows

3.6 explain the purpose of Textstyle

3.7 create and use Textstyles

3.8 explain the use of dimension styles

3.9 modify text & dimensions

3.10 edit text

3.11 edit dimensions

3.12 edit dimension style

3.13 use imperial versa metric dimensions

Content

The content should include but is not limited to:

- Concept of layering
    - Conceptualize the Create simple layer structures within AutoCAD
    - Create layers
    - Assign layer properties, colour palette, line types and line weight
    - Change layers' state
    - Select objects by layers (Quick Select)
- Create window and door openings
- Insert symbols from Design Center and Tool Palette
    - Fixtures for:
        1. Doors
        2. Kitchen
        3. Bathroom
- BLOCKS and WBLOCKS Windows
- Textstyles
    - Text style and format
    - Justification
    - Insert Textstyles in floor plan – Single and Multiline text
- Dimension Styles
    - Insert dimensions using dimension styles in floor plan
    - Create and insert dimension styles to plot scale
    - Dimension style and format
    - Add dimensions to drawings
    - Apply linear dimensions
    - Apply continuous, baseline, aligned dimensions, radius, diameter, textleader
    - Modify text & dimensions
    - Edit text
    - Edit Dimensions
    - Edit dimension style

- Imperial versa metric dimensions

UNIT IV – PERFORMING ADVANCE EDITING TECHNIQUES IN AUTOCAD 10 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 edit dimension style

4.2 use imperial versa metric dimensions

4.3 load linetype

4.4 scale linetype

4.5 insert and scale hatch patterns

4.6 insert Stiffener wblock

4.7 add text and dimension to foundation plan

4.8 apply offset command sub options

4.9 apply lineweight

4.10 scale and insert hatch

4.11 insert donut

4.12 add text and dimension to detail at plot scale

4.13 create and insert Multi-Leader Styles

Content

The content should include but is not limited to:

- Linetype
- Stiffener wblock
- Lineweight
- Hatch and Scale hatch patterns
- Donut
- Plot scale
- Offset command sub options

UNIT V: PERFORMING ADVANCE DRAWING & EDITING COMMAND 10 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 copy walls from foundation plan using layer state

5.2 change linetype for walls from continuous to hidden

5.3 insert and array rafters

5.4 trim and mirror rafters

5.5 create roof covering using hatch options

5.6 create elevations from floor plan

5.7 insert windows and door as WBLOCKS

5.8 create roof on building

5.9 insert landscaping symbol

5.10 create Tablestyle at plot scale

5.11 use advance drawing & editing Commands

5.12 draw Site Plans

5.13 apply surveyor's unit angle

5.14 create site boundary

5.15 apply linetype scale

5.16 copy and insert building in-place

5.17 add landscaping symbols

5.18 create and insert text and dimstyle

Content

The content should include but is not limited to:

- Foundation plan using layer state
- Linetype for walls from continuous to hidden
- Rafters
    - Insert
    - Array
    - Trim
    - mirror
- Roof covering using hatch options
- Elevations from floor plan
- WBLOCKS
    - Windows

- Doors

- Roof on building
- Landscaping symbol
- Tablestyle at plot scale
- Advance Drawing & Editing Commands
- Site Plans
- Surveyor's unit angle
- Site Boundary
- Linetype scale
- Building in-place
- Text and dimstyle

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INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I, II, III,IV,V**	Portfolio	20%
2	**I**	Written Assignment	20%
3	**III**	Group Project	20%

4	**I,II,III,IV,V**	Written	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Ascent, (2010). *AutoCAD 2010 Fundamentals – Part 1 & 2, Student Guide (rev. 1.0) Autodesk*
2. Byrnes, D. (2010). *AutoCAD 2010 for dummies.* New Jersey: Wiley Publishing, Inc.
3. Finkelstein, E. (2012). *AutoCAD 2012 and AutoCAD LT 2012 Bible.* England: John Wiley & Son
4. Gladfelter, D. (2011). *AutoCAD 2011 and AutoCAD LT 2011: No Experience*. Indiana: Wiley Publishing
5. Kirkpatrick, M. J. (2010). *The AutoCAD Book: Drawing, Modeling and Applications Using AutoCAD 2010*, Prentice-Hall Inc.
6. Lockhart, S. (2012). *Tutorial Guide to AutoCAD 2012.* Mission KS: Schroff Development Corporation
7. Omura, G. (2010). *Introducing AutoCAD 2010 and AutoCAD LT 2010*. Indiana: Wiley Publishing
8. Omura, G. (2010). *Mastering AutoCAD and AutoCAD LT*. Indiana: Wiley Publishing
9. Shih, R. H. (2011). *AutoCAD LT 2011 Tutorial*. Mission KS: Schroff Development Corporation
10. Shrock, C. R. (2010). *Beginning AutoCAD 2010 Exercise Workbook*. New York: Industrial Press
11. Tickoo, S. (2011). *AutoCAD 2011: A Problem Solving Approach*. New York: Industrial Press

FACULTY OF COMPUTER SCIENCE AND ENGINEERING

PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	INTERNSHIP/EXTERNSHIP (WORK PLACE ATTACHMENT)
COURSE CODE:	CSMWPA107S1
COURSE HOURS:	240 HOURS
CREDIT VALUE:	1
PREREQUISITES:	COMPLETION OF YEAR 1 COURSES
YEAR/SEM.:	YEAR 1, SEMESTER 1
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This Externship/Work Place Attachment Programme is designed to provide the students with industrial /business placement commensurate with their chosen career. The placement is 240 hours in duration and is intended to give students on-the-job experience appropriate to their occupational area(s) of study. During this period the students are to receive at least one visit from the Tutor and or the Programme Coordinator/Advisor. The student should be assigned a workplace mentor who will facilitate the student's integration into and work experiences in the organization.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this attachment programme students will be able to relate to concepts, theories and techniques, which are studied, to develop and practice a range of technical competencies, personal competencies and social competencies; help students to identify and develop career paths with in their industry. It will also encourage students to develop important

employability skills make contacts with potential employers and to construct work experience profiles commensurate with the demands of future employers and or explore entrepreneurial opportunities.

Upon successful completion of this attachment programme, students are competent when they are able to:

1. practice theoretical principles.
2. follow work instructions.
3. adhere to organizations policies
4. comply with relevant legislations, regulations and codes of practices
5. comply with safety requirements
6. acquire/develop competencies in their occupational area.
7. apply procedures for work processes.
8. analyse work plans and implement as instructed
9. manage area of specialization.
10. plan, organize and implement tasks/assignments according to given instructions and or procedures.
11. work effectively as part of a team.
12. practice employability skills on the job.
13. be productive, efficient, effective, cost controlled and quality focused
14. provide excellent customer service
15. adhere to Dress Codes and Interpersonal Relations Standards
16. conduct research industry trends, document lessons learned, prepare career development plan, prepare and submit report

…….....

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1		Student Daily Logs	10%
2		Appraisal by employer and tutor	20%
3		Written report on experience	100%
4		Hands-on Experience	60%
Total			**100%**

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	APPLYING PHYSICS AND CHEMISTRY TO CONSTRUCTION SITE MANAGEMENT
COURSE CODE:	CSMAPC106S2
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3 CREDITS
PREREQUISITES:	
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to expose learner to key principles in physics and chemistry that is applicable to the building and construction industry. The learner is therefore introduced to laws in physics and chemistry that dictates the design of stable and safe structures within the construction industry.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. demonstrate an understanding of the types of forces on structural components.
2. understand the effect of concurrent and non-concurrent systems of forces.
3. demonstrate knowledge of the potential strength of basic structural members.
4. compute the magnitude and direction of forces acting upon a structural member
5. demonstrate an understanding of the importance of centre of gravity to various structures

6. demonstrate an understanding of the use of mathematical principles to predict the behaviour of structures within the construction industry

UNIT I – CALCULATING THE RESULTANT FORCE FOR STRUCTURES 7 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1. recognize the fundamental units in physics along with their corresponding SI units
2. recognize the symbols for various prefixes used in construction
3. convert from prefix to SI Unit
4. define the term force
5. state the SI Unit for force
6. evaluate the effects of various types of forces on a structure
7. define the following terms:
    - concurrent coplanar forces
    - non-concurrent forces
8. use the principles of the polygon of forces to determine the resultant force acting on a structure
9. calculate the magnitude and direction of the resultant force acting on a structure using component and resolution of forces
7. use Lami's Theorem to determine angle and magnitude of force systems
8. calculate tensions in loaded systems

Content

The content should include but is not limited to:

- Fundamental Units
    - Length – Metres
    - Temperature – Kelvin
    - Mass - Kilograms
    - Current – Amperes
    - Time - Seconds
    - Luminous Intensity - Candela
    - Amount of substance – Mole

- Prefixes

exa	E	10^{18}	Exameter
peta	P	10^{15}	Petasecond
tera	T	10^{12}	Terawatt
giga	G	10^{9}	Gigahertz
mega	M	10^{6}	Megacurie
kilo	k	10^{3}	Kilometer
hector	h	10^{2}	Hectoliter
deka	da	10^{1}	Dekagram
deci	d	10^{-1}	Deciliter
centi	c	10^{-2}	Centimeter
mili	m	10^{-3}	Millimeter
micro	µ	10^{-6}	Micrometer
nano	n	10^{-9}	Nanogram
pico	p	10^{-12}	Picofarad
femto	f	10^{-15}	Femtometer
atto	a	10^{-18}	Attosecond

- Definition of force
- SI Unit for Force
- Types of Forces and their effect on the stability of structures
    - Compressive
    - Tensile
    - Weight
    - Shear Force

- Effects of Forces of Structures
    - Change in shape
    - Motion
    - Change in direction
- Concurrent Coplanar Forces
- Non - concurrent forces
- Polygon of Forces
- Lami's Theorem
- Component and Resolution of Forces

UNIT II – USING THE PRINCIPLE OF MOMENTS FOR STRUCTURES 7 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 define the moment of a force about a point and determine its SI unit.
2.2 state the principle of moments
2.3 explain the conditions of equilibrium of a body under the influence of a system of parallel forces
2.4 use the principle of moments to calculate the reactions of a simple loaded beam
2.5 use the principle of moments to solve problems on equilibrium
2.6 conduct experiments to investigate the turning effects on bodies in equilibrium
2.7 differentiate between concentrated loads and distributed loads
2.8 convert from distributed loads to concentrated loads
2.9 calculate the reactions of uniform distributed load
2.10 assess the relevance of the principle of moments to the design of heavy machineries and building structures.

Content

The content should include but is not limited to:

- Definition of moment of a force
- Equation to calculate the moment of a force
- Principle of moments
- The three (3) conditions necessary for systems in equilibrium

- Distributed Loads
    - Rectangular
    - Triangular

UNIT III – CALCULATING THE CENTRE OF GRAVITY FOR STRUCTURES 7 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 define the term centre of gravity or centroid

3.2 evaluate the significance of centre of gravity to the building of structures

3.3 assess techniques in construction that aids in increasing the stability of tall structures

3.4 conduct experiment to determine the centre of gravity of various shapes

3.5 calculate the centre of gravity of composite shapes

Content

The content should include but is not limited to:

- Definition of terms
    - Centre of gravity
    - Centroid
- Stability and Centre of gravity
    - The taller the structure the more unstable the structure
- Techniques
    - The use of concrete piers or piles
    - The use of frames having high lateral rigidity
- Plumb line method
- Calculating centre of gravity
    - Cones
    - Triangle
    - Composite shapes
- Calculating centroid
    - Beams

UNIT IV – APPLYING CHEMISTRY TO CONSTRUCTION 7 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 use the Bohr's Model to construct a model outlining the components of an atom

4.2 outline the composition of molecules, elements, compounds and alloys

4.3 state examples of outline the composition of molecules, elements, compounds and alloys

4.4 assess the importance of the use of alloys in the field of construction

4.5 distinguish between metals and non-metals

4.6 state examples of metals and non-metals

4.7 justify the use of metals in the construction industry

4.8 justify the use of plastic materials in the construction industry

4.9 justify the use of alloys in the construction industry

4.10 identify at least 5 characteristics of polymers and its use in the construction industry

4.11 justify the use of polymers in the construction industry

Content

The content should include but is not limited to:

- Definition of the following terms:
  - Matter
  - Atom
- Composition of an atom
  - Protons
  - Neutrons
  - Electrons
- Characteristics of the particles of an atom
  - Mass
  - Charge
  - Location

    - Effect in a magnetic field
    - Effect in an electric field
- Definition of the following terms:
    - Elements
    - Molecules
    - Compounds
    - Alloys
- Examples of the following:
    - Elements
    - Molecules
    - Compounds
    - Alloys
- Characteristics of metals and non-metals
    - Conductivity
    - Space between particles
    - Compressibility
- Examples of metals and non-metals
- Use of metals and non-metals in the construction industry
- Examples of elements, molecules, compounds and alloys.
- Definition of the term polymers
- Examples of polymers
    - poly vinyl chloride
    - polyethylene
    - rubber
    - latex
- Use of polymers in the construction industry
    - Strength
    - Resistance to chemical reactions

- Weight comparison to metals
- Resistance to heat
- Durability

UNIT V – TESTING THE STRENGTH OF MATERIALS IN THE CONSTRUCTION INDUSTRY 7 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 state Hooke's Law

5.2 apply Hooke's law to the construction industry

5.3 various springs to determine the spring constant and elastic limit

5.4 use load-extension graphs to determine if a material obeys or disobeys Hooke's Law

5.5 define the terms stress and strain

5.6 define Young's Modulus of elasticity

5.7 define Modulus of Rigidity

5.8 describe an experiment to find the ultimate tensile strength of a material

Content

The content should include but is not limited to:

- Hooke's Law
- Load-Extension Graphs
- Young's Modulus of elasticity
- Modulus of Rigidity
- Tensile Steel Test

UNIT VI – CALCULATING THE FACTOR OF SAFETY FOR RETAINING WALLS 7 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

6.1 define the term "factor of safety"

6.2 calculate the factor of safety for retaining walls

6.3 examine the importance of factor of safety to structures

Content

The content should include but is not limited to:

- Definition of term "Factor of Safety"
- Retaining walls and Factor of Safety
- Importance of Factor of safety in Construction

INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips
- Field Activities

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I, II, III,IV,V,VI**	Portfolio	20%
2	**I,II**	Written Assignment	20%
3	**IV,VI**	Group Project	20%
4	**III,V**	Written	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Giancoli, C. D. (2004). Physics: Principles with Applications (4th ed.). New Jersey, NJ: Prentice Hall.
2. Cushing, T. J. (2007). Theory Construction and Selection in Modern Physics: The S Matrix. Cambridge University Press.
3. Avison J.H (1988).Physics for CXC. London: Thomas Nelson and Son Ltd.
4. Hens, L. C. H. (2005). Building Physics - Heat, Air and Moisture: Fundamentals and Engineering Methods with Examples and Exercises. New Jersey, NJ: Wiley.

FACULTY OF COMPUTER SCIENCE AND ENGINEERING

PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	ERECTING CONCRETE STRUCTURES
COURSE CODE:	
COURSE HOURS:	120 HOURS
CREDIT VALUE:	4 CREDITS
PREREQUISITES:	
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to expose learner to key principles and techniques employed to erect concrete structures in the building and construction industry. The course focuses on concrete making materials including supplementary cementitious materials. The learner would garner first-hand knowledge on concrete production process and properties and uses of concrete as a modern material of construction as well as enabling the learner to make appropriate decision regarding ingredient selection and use of concrete. With this knowledge the learner would erect small structures use concrete and other building materials.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon successful completion of this attachment programme, students are competent when they are able to:

1. demonstrate an understanding of the properties of concrete

2. demonstrate the use of various tests to analyse the strength of concrete
3. demonstrate knowledge on the importance of aggregates during the preparation of concrete
4. justify the importance of aligning concrete mixtures and its aggregates to the relevant building codes both locally and globally

UNIT I – ANALYSING THE PROPERTIES OF CONCRETE 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 evaluate the properties of cement
1.2 discuss the properties and composition of various types of cement and their use in the concrete industry
1.3 justify the use of various types of aggregates during the production of cement
1.4 demonstrates the aggregate quantities typically used in concrete
1.5 define the term “cementitious materials”
1.6 calculate water/cementitious materials ratios
1.7 assess the effects of admixtures on the properties of concrete
1.8 explain how the dose of lithium admixture is calculated to control alkali-silica reactions.
1.9 demonstrate the proper sequencing of admixtures
1.10 assess the effects of fly ash, blast furnace slag, silica fume, and metakaolin on the properties of concrete
1.11 justify the effects of cement fineness on water demand and concrete strength properties
1.12 recognize the importance of controlling heat of hydration in concrete
1.13 discuss precautions that should be taken when interfacing with dry and wet concrete
1.14 use various techniques for preparing different types of concrete
1.15 use the correct water to cement ratio to prepare various types of concrete
1.16 use the correct aggregate ratio to prepare various types of concrete

Content

The content should include but is not limited to:

- Occupational Health and safety standards for interfacing with cement
- Properties of cement
    - Fineness of cement
    - Soundness
    - Consistency
    - Strength
    - Setting time
    - Heat of hydration
    - Loss of ignition
    - Bulk density
    - Specific gravity (Relative density)
- Types of cement and their uses
    - Ordinary Portland Cement (OPC)
    - Portland Pozzolana Cement (PPC)
    - Rapid Hardening Cement
    - Quick setting cement
    - Low Heat Cement
    - Sulphates resisting cement
    - Blast Furnace Slag Cement
    - High Alumina Cement
    - White Cement
    - Coloured cement
    - Air Entraining Cement
    - Expansive cement
    - Hydrographic cement
- Materials used to make cement
- Types of aggregates and their significance in cement production
- Silt Test
- Supplementary cementitious materials
- Water to cement ratio
- Aggregate ratio

- Types of concrete
    - Pre-stress concrete
    - Post-Tension Concrete
    - Insitu Concrete
    - Reinforce concrete
    - Mass concrete
- Environmental factors that increase the probability for plastic shrinkage cracking
- Factors that impact the strength of concrete
- Durable aspects of concrete
- Effects of various types of admixtures on the properties of concrete
    - Water-reducing admixtures
    - Retarding admixtures
    - Accelerating admixtures
    - Superplasticizers
    - Corrosion-inhibiting admixtures

UNIT II – EVALUATING THE STANDARDS AND QUALITY FOR CONCRETE 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 describe the difference between a code and a specification

2.2 assess the requirements for the strength of concrete

2.3 construct the process of ordering ready-mixed concrete

2.4 assess the requirements for concrete production facilities

2.5 summarize the requirements for the delivery of ready-mixed concrete

2.6 analyze techniques used in the acceptance testing of ready-mixed concrete

2.7 utilize various specimens for standard testing procedures

2.8 analyze, interpret data to make recommendations regarding selection and use of materials for various applications

Content

The content should include but is not limited to:

- Code and Specification of concrete

- Requirements to increase the strength of concrete
- Process for ordering ready mix concrete
- Requirements for concrete production facilities
- Requirements for the delivery of ready-mix concrete
- Acceptance Testing of ready mix concrete
    - Sampling from stationary mixers
    - Sampling from ready-mix concrete trucks
    - Concrete age-strength relationship
    - Compressive strength tests
    - Slump test

UNIT III – PREPARING FOR BRICK/BLOCK LAYING 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 recognize hazards associated with the use of bricklaying and block laying tools, plant and equipment

3.2 use various manual handling techniques when brick and block laying

3.3 calculate the material requirements from drawings

3.4 demonstrate techniques for bricklaying and block laying tasks

3.5 adhere to workplace and equipment safety requirements

3.6 construct straight block wall using appropriate mortar

3.7 construct column or pier using concrete blocks

3.8 construct corner walling using concrete blocks

3.9 construct cross over walling using concrete blocks

Content

The content should include but is not limited to:

- Techniques for preparing mixes
- Manual handling techniques
- Techniques for brick and block laying
- Occupational health and safety for block and brick laying
- Types of mortar

- Column or Pier
- Corner Walling
- Cross Over Walling

UNIT IV – USING CONCRETE 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 construct a concrete walk way

4.2 construct a driveway

4.3 create lawn tiles used in the construction industry

4.4 demonstrate the sequence for finishing concrete

4.5 demonstrate the sequence for curing concrete

4.6 carry out special finishes to concrete

4.7 carry out tilt slab construction

Content

The content should include but is not limited to:

- Finishing Concrete
- Curing Concrete
- Special Finishes to concrete must include know applications such as acrylics (Trowel on)
- tilt slab construction
- Construction of walk ways
- Construction of driveways
- Construction of lawn tiles

UNIT V – REINFORCING CONCRETE STRUCTURES 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 evaluate reasons for using reinforcement in concrete structure

5.2 demonstrates proper placement of reinforcement in concrete structures

5.3 assess the importance of Pre-stressing and post-tensioning

5.4 demonstrates knowledge on SI (metric) sizes for reinforcement and strength grades of deformed steel bars

5.5 compare fiber-reinforced polymer (FRP) bars with steel bars

5.6 demonstrates the proper use of FRP bars;

5.7 demonstrates the proper use of steel fibers in concrete

5.8 evaluates the effects of fibers on plastic and drying shrinkage cracking

5.9 demonstrates proper care and protection of coated and uncoated bars

Content

The content should include but is not limited to:

- Importance of reinforcement in concrete structures
- Proper placement of reinforcement
- SI (metric) sizes for reinforcement
- Strength grades of deformed steel bars
- Fiber-reinforced polymer
- Plastic and drying shrinkage cracking
- Coated and uncoated bars

INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips
- Field Activities

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I, II, III,IV,V**	Portfolio	20%
2	**I**	Written Assignment	20%
3	**II**	Group Project	20%
4	**III, IV,V**	Practical	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Hens, L. C. H. (2005). Building Physics - Heat, Air and Moisture: Fundamentals and Engineering Methods with Examples and Exercises. New Jersey, NJ: Wiley.

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	ERECTING WOODEN STRUCTURES
COURSE CODE:	
COURSE HOURS:	120 HOURS
CREDIT VALUE:	4 CREDITS
PREREQUISITES:	
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course provides the learner with critical knowledge about timber as it is becoming an increasingly popular material in the built environment due to its appealing aesthetics, high strength-to-weight ratio, the potential for prefabrication and rapid construction, versatility and sustainability. The learner will be armed with practical knowledge as they investigate the use of timber in future mid and tall wooden structures.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. demonstrate knowledge on the properties of timber
2. demonstrate knowledge on the use of various types of timber in the construction industry
3. demonstrate knowledge on typical structural systems for timber structures

4. understand the Jamaican Building Codes on erecting timber structures
5. understand various methods to test the strength of timber
6. demonstrate an understanding of the various techniques to join timber within the construction industry
7. exhibit an understanding for methods used as reinforcement in timber structures
8. demonstrate an understanding of techniques used to preserve the life on timber
9. display an understanding of the behaviour of connections under fire exposure

UNIT I – EVALUATING THE PROPERTIES OF TIMBER 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 justify the use of timber in the construction industry based on its mechanical properties

1.2 justify the use of various types of timber in the construction industry

1.3 value typical structural systems for timber structures

1.4 evaluate methods of testing the structural integrity of timber

1.5 Assess the Jamaican Building Codes on erecting timber structures

Content

The content should include but is not limited to:

- Mechanical properties
    - Strength
    - Stiffness
    - Durability
- Types of Timber
    - Hard
    - Soft

- Glue-laminated Timber
- Laminated veneer lumber (LVL)
- Cross-laminated timber

- Methods to test timber
  - Oven dry testing
  - Moisture meter
  - Compression Test
- Jamaica Building Codes
  - Design rules for timber structures
  - Verification of timber structures

UNIT II – DESIGNING AND JOINING TIMBER **9 Hours**

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 use of tools that are required to build timber structures

2.2 demonstrate the use of structural reinforcements in wooden structures

2.3 use various techniques of joining wooden structures

2.4 design timber structures for multi-story buildings, halls and bridges

Content

The content should include but is not limited to:

- Tools

- Claw Hammer
- Utility Knife
- Moisture Meter
- Chisel
- Level
- Screwdriver
- Nail Set
- Sliding Bevel
- Layout Square
- Block Plane
- Caliper
- Bench Grinder
- Circular Saw
- Power Drill
- Surface Planer

- Structural Reinforcements
  - Column Support
  - Flitch Plates
  - Sistering
  - Epoxy Rebar
  - Screws
  - Glues In Rods

- Techniques for developing wooden frames
  - Platform Frame
  - Engineered Stud Method
  - Structural Insulated Panels
  - Cross-laminated timber (CLT) building systems

UNIT III – PRESERVING TIMBER 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 assess the problems that affects the longevity of timber in the construction industry

3.2 apply the appropriate preservative treatments to increase the longevity of timber

Content

The content should include but is not limited to:

- Types of Problems
  - Woodworm
  - Dry Rot
  - Wet Rot
- Preservative Treatments
  - Boron salts
  - Copper, chromium and arsenic salts (CCA)
  - Light organic solvent-borne preservative (LOSP)
  - Alkaline copper quat (ACQ)
  - Copper azole
  - Creosote and pigment emulsified creosote (PEC)
- Application
  - Pressure treatment
- Treatment
  - To treat rot, all affected timber as well as timber within 500 mm of fungal attack must be removed. Contaminated plaster should be removed and adjacent mortar joints to masonry should be raked out.
  - For wet rot, as long as the source of dampness has been removed and the affected area has been allowed to dry, this should be sufficient.

- For dry rot, the surfaces of masonry and concrete may need to be sterilized using a fungicide.

UNIT IV – PROTCETING TIMBER FRAMES FROM FIRES 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 perform a timber frame fire risk assessment on a construction site

4.2 evaluate techniques used to eliminate the fire hazards associated with timber both in and out phase of the project

4.3 assess methods to mitigate the fire risk associated with timber frames

4.4 justify the relevance of the Jamaica Fire Codes as it relates to erecting timber structures

Content

The content should include but is not limited to:

- Fire Risk Assessment
- Eliminating Hazards
  - Occupant Capacity of a Building Space
    1. Calculation

       The number is calculated by dividing the area of room or storey(s) (m^2) by a floor space factor (m^2 per person)
  - Closeness of adjacent buildings
  - Ignition of adjacent property through radiated heat
  - The means of escape from adjacent structures
- Risk mitigation exercise at the planning and design stage
- Jamaica Fire Codes for Structures

UNIT V: USING MATERIALS FOR PARTITION FRAMES 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 differentiate between Wolmanized Pitch Pine and Pitch Pine

5.2 analyse the different types of materials used as studs

5.3 analyse the different types of materials used as top plate and bottom plate

5.4 determine the function of staggered blocking board

5.5 construct load bearing walling

5.6 construct non load bearing walling

Content

The content should include but is not limited to:

- Types and sizes of lumber
- Types of fasteners
- Header
- Double header
- Studs
- Door frames
- Window frames
- Irregular shape partition
- Ironmongery
- Lap joint
- Dove tail joint
- Scarf joint
- Half lap joint
- Butt joint

UNIT VI: APPLYING CLADDING TO WOODEN STRUCTURES 5 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

6.1 differenciate between various types of cladding

6.2 analyse the various methods for installing cladding

6.3 critique the various materials used for installation

6.4 install sheetrock according to specifications

6.5 install fibre rock according to specifications

6.6 tape and plaster different types of cladding according to specifications

6.7 prepare different types of cladding for painting according to specification

Content

The content should include but is not limited to:

- Tape and plaster
- Dry wall compound
- Sheetrock
- Fibre rock
- Concrete board
- Durock
- Sand papers
- Emerald cloth
- Types of fasteners
- Splicing
- Insulation

UNIT VII: CONSTRUCTING TIMBER FLOOR 5 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

7.1. differentiate between subfloors and suspended floors

7.2. analyse difference between the structural floor members

7.3. construct a timber floor subfloor

7.4. construct a suspended timber floor

7.5. applying finishes to wooden structures

Content

The content should include but is not limited to:

- Floor joists
- Herring board truss
- Headers
- Sill
- Trimming Joists
- Trimmer Joists
- Girder

- Ledger
- Finishing techniques for wooden structures (varnishing, painting, gloss/glaze finishing, etc)

INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips
- Field Activities

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I, II, III,IV**	Portfolio	20%
2	**I**	Written Assignment	20%
3	**II**	Group Project	20%
4	**II,III, IV**	Practical	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Hens, L. C. H. (2005). Building Physics - Heat, Air and Moisture: Fundamentals and Engineering Methods with Examples and Exercises. New Jersey, NJ: Wiley.

FACULTY OF CONSTRUCTION AND ENGINEERING

PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	MANAGING CONSTRUCTION PROJECTS
COURSE CODE:	
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3 CREDITS
PREREQUISITES:	
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is designed to expose students to the knowledge, skills and aptitudes need to manage projects and to work in an environment where the successful management of projects is critical to the meeting of timeline to avoid cost overruns, and to maximize the use of resources and to meet customer satisfaction. Students will be exposed to project management software, project management tools, such as GANTT charts, critical path. Analysis,

management of project teams, management of multi-projects, and to manage the projects life cycle.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. Develop and scope project activities
2. Schedule and timeline project activities
3. Implement and monitor projects
4. Manage multi-projects
5. Use project management software and tools
6. Perform critical path analysis for construction projects
7. Implement measures to avoid cost overruns for construction projects
8. Prepare and implement contingency plan for a construction project
9. Adhere to project procedures according to international standards

UNIT I – PREPARE PRE-PROJECT SETUP/INITIATION 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1. Define project management
1.2. Identify the characteristics of a project
1.3. Interpret the requirements to complete a pre-project setup/initiation
1.4. Apply the steps in validating a project
1.5. Explain the contents of a project charter
1.6. Summarize the project life cycle
1.7. Conduct feasibility arrays
1.8. Align project to strategic plan
1.9. Develop a project charter

Content

The content should include but is not limited to:

- Definition of Project Management

- The planning, organizing, and managing of tasks and resources to accomplish a defined objective, usually with constraints on time and cost.

- The Definition and Characteristics of a Project:
  - Temporary endeavour
    - Delivers a unique product or service
    - Bound by time
    - Resources and quality
  - Completing a Pre-Project Setup/Initiation:
    - Identify the project
    - Validate the project
    - Prepare a project charter
    - Obtain approval for a project charter
  - Validating a Project:
    - Validate business case: Feasibility analysis, Justification for project, Alignment to strategic plan
    - Identify and analyse stakeholders
  - Project Charter
    - Key project deliverables
    - High level milestones
    - High level cost estimates
    - Identify stakeholders
    - General project approach
    - Problem statement
    - High level assumptions
    - High level constraints
    - High level risks
    - Project objectives
  - Project Life Cycle
    - Initiating/Pre-project setup
    - Planning
    - Executing
    - Monitoring/controlling
    - Closing project

UNIT II – Applying Construction Management Techniques 25 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1. Prepare a project scope document based on an approved project charter
2.2. Use a Work Breakdown Structure (WBS) and WBS dictionary to organize project planning
2.3. Outline a process for managing changes to the project
2.4. Develop a project schedule based on WBS, project scope and resource requirements
2.5. Create a project schedule using Project Management Software
2.6. Evaluate a desired deliverable, apply the appropriate tool and/or method to produce the appropriate outcome

2.7. Interpret the results of using project management tools and/or methods in a given scenario
2.8. Identify components of an internal/external communication plan
2.9. Outline the components of a risk management plan
2.10. Identify roles and resource requirements based on WBS and resource availability
2.11. Identify components of a quality management plan
2.12. Identify components of a cost management plan
2.13. Follow the procurement process for a project implantation
2.14. Explain the purpose and common components of a transition plan

Content

The content should include but is not limited to:

Document

- Key Performance Indicators (KPIs)
- Scope boundaries
- Constraints
- Assumptions
- Detailed objectives
- Final project acceptance criteria
- Validate scope statement with stakeholders

• Work Breakdown Structure and Work Breakdown Structure Dictionary

- Explain the benefits of WBS
- Explain the levels of a WBS
- Explain the purpose of a WBS
- Identify the planning processes which utilize the WBS as an input
- Critique a given WBS
- Explain the purpose of a WBS dictionary

• Project Update Management

- Approvals required
- Forms needed
- Turnaround times
- Document routing
- Communication flow

• Project Scheduling

- Listing and sequencing project tasks according to job requirements
- Estimation of task duration
- Schedule to milestones
- Analyze Gantt chart
- Identify dependency types
- Determine the critical path of a project schedule

- Establish schedule baselines
• Tool Selection for Appropriate Deliverable Handling
- Tools: - PERT, Gantt
- Methods, CPM
- Result Interpretation
- Tools: GERT
- Methods - Network diagram (ADM, PDM, CDM, CCM)
• Project Management Software (Lab component)
- Inserting new and recurring tasks
- Deleting, moving tasks
- Sub-tasks (Indent and Outdent)
- Viewing the Gantt chart & PERT chart (identifying the critical path, milestones)
- Reports – task usage, costs, over allocated staff, completed tasks
- Resource levelling
- Updating tasks
- Change non-working time (e.g. public holidays)
• Internal / External Communication
- Frequency
- Format (formal, informal, written and verbal)
- Method of distribution
- Distribution list
• Risk Management Plan
- Initial risk assessment
- Risk matrix
- Risk register

- Risk response strategies
- Stakeholder risk tolerance

• Roles and Resource Requirements

- Identify existing resource availability
- Identify training needs / outsourcing requirements
- Assign resources to scheduled tasks

• Quality Management Plan

- Quality metrics, control limits, and frequency of measurement
- Quality assurance processes
- Quality control processes
- Quality baseline

• Cost Management Plan

- Control limits
- Assign costs
- Chart of accounts
- Project budget
- Cost estimates (bottom up, top down, parametric, expert judgment, analogous)
- Cost baseline

• Procurement Process

- Project needs assessment / gap analysis
- Make or buy decision
- RFI, RFQ, RFP (Request for: Information, Quote, Proposal)
- Request seller response
- Evaluate seller response
- Vendor selection
- Contract development

• Transition plan

- Ownership
- Transition dates
- Training
- Extended support
- Warranties

UNIT III – Lead Project Management Team 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1. Evaluate different leadership styles
3.2. Evaluate the impact of the different leadership styles
3.3. Demonstrate the characteristics of effective project leader
3.4. Differentiate between leadership and motivation
3.5. Select the most appropriate leadership style given particular scenario
3.6. Select the most appropriate method to motivate the project team given a particular scenario
3.7. Coordinate human resources to maximize project performance
Explain the importance of a project kick-off meeting

3.8. Conduct the project kick-off meeting
3.9. Explain the purpose and influence of organizational governance on a project's execution
3.10. Select components of a project plan affected by governance and determine actions to be taken
3.11. Explain the different types of project organizational structures
3.12. Select the most appropriate way to manage a project given an organizational structure

Content

The content should include but is not limited to:

- Leadership and Motivation
  - Definition of leadership
  - Leadership styles: Task oriented, Participative, Autocratic, Reward based, Laissez faire, Situational
  - Definition of motivation
  - Motivation Theories: Maslow's hierarchy, David C McClelland's motivational needs theory, Frederick Herzberg's Motivation – Hygiene (Two Factor) Theories
  - Coordinating Human Resources
  - Assemble and develop project team, build team cohesiveness, perform individual performance appraisals
  - Identify common causes of conflict: Competing resource demands, Expert judgment, Varying work styles
  - Detect conflict and apply conflict resolution techniques: Smoothing, Forcing, Compromise, Confronting, Avoiding, Negotiating

- Project Kick-off Meeting:
  - Communicates stakeholder expectations, high level timeline, project goals and objectives, roles and responsibilities to the project team

- Organizational Governance:
    - Standards compliance: Local, state, federal, ISO
    - Internal process compliance: Audit trails, retention, version control
    - Decision oversight: Change Control Board, committee consulting
    - Phase gate approval: Tollgate approval, project phase transition

- Components of Project Plan Affected and Actions:

Actions: Schedule meetings, Manage scope, Follow communications plan, Manage project quality, Manage risks, Issue management, Prepare performance

    - reports, Receive work performance information, Manage costs within budget, Implement approved changes
    - Components: Risk register, Communications plan, Issues log, Change management form, Quality management metrics, Project schedule, WBS, Budget, Resource requirements, Scope statement
    -

- Types of Organizational Structures
    - Functional
    - Weak matrix
    - Matrix
    - Strong matrix

UNIT IV – Manage Projects 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1. Explain project management procedures
4.2. Follow project management procedures in execution of projects
4.3. Manage projects according to project plan, scope and time lines
4.4. Implement change management procedures given a scenario
4.5. Evaluate the impact of potential changes to triple constraint
4.6. Use risk management plan to determine appropriate response to potential risks or opportunity events
4.7. Execute appropriate resource levelling techniques
4.8. Apply the appropriate steps to ensure quality of project deliverables
4.9. Identify tools to use when a project deliverable is out of specifications
4.10. Calculate and interpret the results of Earned Value Measurements (EVM).
4.11. Manage and implement information distribution based on communication plans
4.12. Address the special communication needs internal and/or external project team members.

Content

The content should include but is not limited to:

- Project Management Procedures
  - Identify change
  - Document using the appropriate change control forms
  - Perform impact analysis
  - Coordinate with the appropriate stakeholders to select the course of action
  - Update the appropriate project plan components based on the approved change request
- Triple Constraint
  - Time / Schedule
  - Cost / resources
  - Quality
  - Scope
- Risk Management Plan
  - Perform qualitative and quantitative risk analysis
  - Opportunities: Sharing, Exploiting, Enhancing
  - Threats: Avoidance, Acceptance, Mitigation
  - Update risk register with appropriate changes
- Resource Levelling Techniques
  - Fast tracking
  - Crashing
  - Delaying
  - Optimizing: Use of tools as necessary
- Ensuring Quality of Project Deliverables
  - Monitor work performance
  - Analyze performance information
  - Identify variances
  - Generate change requests
  - Implement change requests
- Tools to use when a project deliverable is out of specification
  - Pareto charts
  - Histograms
  - Run charts
  - Ishikawa diagram
- Earned Value Measurement (EVM)
  - EV
  - PV
  - CPI
  - SPI
  - EAC
  - ETC
  - VAC
  - BAC
- Information Distribution based on Communications plan
  - Manage stakeholders' expectations
  - Schedule effective project meetings

Periodic stakeholders updates

- Special Communication Needs

- Time zones
- Language barriers
- Technology barriers
- Cultural differences
- Communication preferences

Functional or hierarchical barrier

UNIT V: Close out Project 6 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1. Differentiate the types of closure of Projects
5.2. Explain the importance of and benefits of formal project closure
5.3. Determine circumstances in which project closure may occur
5.4. Implement the various closing tasks
5.5. Identify the components and purpose of closing documentation
5.6. Prepare closing documents
5.7. Close out projects following approved procedures

Content

The content should include but is not limited to:

- Types of closure
  - Definition of closure/termination
  - Termination by extinction
  - Termination by addition
  - Termination by integration
  - Termination by starvation
- Formal Project Closure
  - Importance and benefits
- Phase Closure:
  - Phase closure
  - Project completion
  - Stage completion
  - Component completion

Project cancellation – change in environment, lack of funds, better alternatives

- Closing Tasks:
  - Ensure that tasks have been completed
  - Confirm and document objectives that were completed/not completed
  - Meet with stakeholders to get their final approval
  - Finalize contractual commitments - to vendors, suppliers etc.
  - Transfer responsibilities (e.g. maintenance tasks)
  - Reassign people
  - Conduct performance appraisals
  - Release and reassign resources
  - Ascertain any product support requirements

- Complete final accounting
- Provide historical information for future use
- Standards compliance: Document retention compliance
- Document the results
- Have a formal meeting to acknowledge completion.
- Review the results – what went right/wrong
-

- Closing Documentations
  - Lessons learned: Strengths / weaknesses
  - Close report: Historical data, Summary of costs
  - Post mortem analysis: Documents reasons for early closure and impact
  - Final individual performance appraisals

Transition plan

UNIT VI: Evaluate Project Management Tool/Methodologies 5 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

6.1 Use the features of the latest tools used in project management
6.2 Explain the latest methodologies used in project management
6.3 Follow up and analyse trends and development

Content

The content should include but is not limited to:

- Project management tools
  - Charting tools
  - Collaboration tools
  - Cloud based tools
- Project management methodologies
  - Agile project management

Remote team management

INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips
- Field Activities
- Project Management Software

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1	**I, II, III,IV**	Portfolio	20%
2	**I**	Written Assignment	20%
3	**II**	Group Project	20%
4	**II,III, IV**	Practical	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Nunnally, W. S. (2011). Construction Methods and Management. New Jersey, NJ: Pearson.

COURSE OUTLINES

Year 2 Semester 3

FACULTY OF COMPUTER SCIENCE AND ENGINEERING

PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	PERFORMING SITE SURVEYING
COURSE CODE:	CSMSUR215S3
COURSE HOURS:	120 HOURS (30 Hours Theory 90 Hours Practical)
CREDIT VALUE:	4 CREDITS
PREREQUISITES:	
YEAR/SEM.:	YEAR 2, SEMESTER 3
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is structured to give students a basic, practical knowledge of the fundamental principles and applications of land surveying. More specifically, the course will look at the nature of surveying, horizontal distance measuring, angular measurements and leveling, as it relates to the construction industry, engineering data, ordnance and global positioning.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon successful completion of this attachment programme, students are competent when they are able to:

1. Demonstrate an understanding of the correct use of various tools used why capturing measurements for survey documents according to international standards
2. Demonstrate knowledge of conducting chain surveying and levelling instrumentally as well as by using mathematical formulas

3. Understand the theory and practice of measuring, recording, assessing and presenting physical configuration
4. Support the relationship between measured values and calculated values and the degrees of accuracy for given practical assessments
5. Value the application of survey data to construction of buildings, roads and road alignments, travel, maps building, coordination of global positions and areas, angular as well as distance measurements

UNIT I – APPLYING BASIC SURVEY CONCEPTS 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 Define the term "surveying"

1.2 Appraise the types of surveys according to international surveys

1.3 Outline the classes of surveys that are performed on a construction site

1.4 Outline the uses of survey tools

1.5 Use surveys tools in field work according to international standards

1.6 Assess at least seven (7) applications of surveys in the construction industry

1.7 Compare historic and modern methods of surveying

1.8 Perform the principles of surveying according to international standards in field work exercises

1.9 Differentiate between the branches of surveying

1.10 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

1.11 Establish field notes and data and list rules for establishing such data

1.12 Establish preliminary planning of survey exercises

1.13 Establish boundaries, corners, and tie marks

1.14 Prepare for a reconnaissance survey

1.15 Prepare the data collection book for surveying exercise

1.16 Establish field notes and data

1.17 List rules for establishing such data in the field

1.18 Examine the nature of geomatic instruments

1.19 Conduct angular measurement through location ties or with a compass

Content

The content should include but is not limited to:

- Definition the term “surveying”
- Types of surveys
    - Plane
    - Geodetic
    - Preliminary
- Classes of surveys that are performed on a construction site
    - Control
    - Preliminary
- Survey tools
    - Historic
    - Modern
- Methods of Surveying
    - Historic
    - Modern
- Principles of Surveying
- Survey Referencing
    - Grid Reference
    - Legal Reference
    - Vertical Reference
    - Geographic Reference
    - Accuracy and precision
    - Location methods
    - Unit of measure
    - Accuracy ratio
    - Distance measurement
- Survey Tools
- Branches of Surveying
- Field notes and data and list rules for establishing such data
- Planning of survey exercises

- Establish boundaries, corners, and tie marks
- Reconnaissance Survey
- Geomatic instruments
- Angular Measurement

UNIT II – CONDUCTING DISTANCE MEASURING AND CHAIN SURVEYING 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1. Outline equipment used in chain surveying and distance measuring
2.2. Assess the characteristics and use of tapes and chains
2.3. Inspect ways that tapes are marked or gradated
2.4. Use tapes chain surveying equipment according to international standards
2.5. Conduct a chain survey during field work according to international standards
2.6. Set out or set up measuring instruments over stations (plumbed with optical squares or plumb bob)
2.7. Locate stations or targets accurately during a field exercise
2.8. Set and reset geomatic instrument positions to read horizontal face right and left
2.9. Apply appropriate tools to measure distances accurately
2.10. Observe surveying error after a field exercise
2.11. Practice to "book information" for chain surveying field work

Content

The content should include but is not limited to:

- Chain Surveying Equipment
- Distance Measuring Equipment
- Tapes and Chains
    - Characteristics
    - Ways in which tapes are marked or graduated
- Set-up or Set-out Equipment
- Stations and Targets
- Surveying Errors

- Geomatic Instruments
- Reports
    - Bounded and unbounded books
    - Instruments database

UNIT III – CONDUCTING A LEVELLING SURVEY 9 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 Define the term "levelling"

3.2 Outline the characteristics and uses of a level, theodolite and total station

3.3 Illustrate the components of a level and a tripod

3.4 Operate a level, staff and a tripod according to international standards

3.5 Conduct a levelling survey to include reading various types of "staff" markings

3.6 Demonstrate the procedures to "book information" from levelling field work

3.7 Create a field book with notes from surveying activities at various locations

3.8 Calculate the absolute values of a levelling exercise

Content

The content should include but is not limited to:

- Types of Levels
- Components of
    - Levels
    - Tripod
- Preparing a Levelling Report
- Absolute values

UNIT IV – USING MAPS 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 Explain the importance of the use of maps in surveying

4.2 State the types of maps used during survey activities

4.3 Point-out the meanings of different symbols used on a map

4.4 Use the map scale to note distances on site

4.5 Use map symbols to observe features on a site

4.6 Design a table of map symbols for a site

4.7 Debate the use of map production during surveying exercises

4.8 Judge the use of the following map production: ink drawing, hand lettering, stencils while performing survey activities

4.9 Define the term "photogrammetry"

4.10 Operate the camera system used in aerial photography according to international standards

4.11 Distinguish between flight lines and overlaps in photogrametry

4.12 Calculate scale ratio (SR), flying heights (H), focal length (f), and photo scale

4.13 Explain the photographic scale with the use of a diagram

4.14 Explain with the aid of a diagram the relationship between ground datum and flying height

4.15 Explain three things that aerial photography could help to interpret within zones

4.16 Draw a profile of a simple contour plan with its elevations on both the end (sectional) and plan view

4.17 Evaluate GPS augmentation

Content

The content should include but is not limited to:

- Importance of the use of maps
- Types of maps
- Map Symbols
- Map Scale
- Advantages and Disadvantages of Map Production
    - Ink Drawing
    - Hand Lettering
    - Stencils
- Photogrammetry
    - Aerial Photography
    - Camera System

- Flight Lines and Overlaps
- Scale ratio
- Flight Heights
- Focal Length
- Photoscale
- Ground Datum

- Contour Plan
- GPS Augmentation

UNIT V – PERFORMING VOLUME AND AREA COMPUTATIONS 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 Compare the terms " cross-section" and "profile"

5.2 Sketch the cross-sectional arrangement for a cut and fill section for a road

5.3 Calculate volume using the prismoidal formula/end areas

5.4 Calculate areas trapezoidal technique/Simpson's 1/3 rule

5.5 Sketch a topographical area for a section to be filled for road construction

Content

The content should include but is not limited to:

- Cross-section
- Profile
- Prismoidal Formula/end areas
- Trapezoidal Technique
- Simpson's 1/3 Rule

UNIT V – CONDUCTING TRANVERSING 9 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

6.1 Define the term "traverse"

6.2 Assess the types of traverse used in surveying

6.3 State the definition of critical components of traversing

6.4 Sketch diagram to show reverse bearings

6.5 Establish a right angle using a double right angle prism (optical square)

6.6 Layout corners using a double right angle prism (optical square)

6.7 Establish north using a compass

6.8 Calculate magnetic declination from various surveys

6.9 Calculate azimuth data with the use of a sketch

6.10 explain the term deflection angles

6.11 Justify an azimuth computation from the south east quadrant with the use of a diagram (or any other quadrant)

6.12 Apply calculations for bearing and azimuth checks in case scenarios with presented information or using the text book in a clockwise and anticlockwise direction

6.13 Perform a bearing computation for a closed traverse/open traverse

6.14 Explain how lines are represented within a reference system to create latitudes and departures

Content

The content should include but is not limited to:

- Definition of terms
    - Traverse
    - Bearings
    - Azimuth
    - Horizontal angle
    - Vertical angle
    - Deflection Angles
- Types of traverse
    - Closed
    - Open
- Right angle using a double right angle prism (optical square)
- Corners using a double right angle prism (optical square)
- North using a compass
- Calculate magnetic declination
    - original survey

- previous survey
- year to a future time survey

- Differences between bearings and azimuth
- Calculate azimuth data and bearings

INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips
- Field Activities
- Simulations

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1		Surveying Book	20%
2		Written Assignment	20%
3		Group Project	20%
4		Practical	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Kavanaugh, B. F. (2008). Surveying: Principles and Applications (8th ed.). New Jersey, NJ: Prentice Hall.
2. Nathanson, A. J., Lanzafama, M., & Kissam P. (2005). Surveying Fundamentals and Practices (5th ed.). New Jersey, NJ: Prentice Hall.
3. Gibson, R. (2009). The Theory and Practice of Surveying: Containing All the Instructions Requisite for the Skillful Practice of This Art. University of Michigan Library.

FACULTY OF COMPUTER SCIENCE AND ENGINEERING

PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRCUTION SITE MANAGEMENT
COURSE NAME:	ERECTING ROOF STRUCTURES
COURSE CODE:	CSMROO216S3
COURSE HOURS:	120 HOURS (30 Hours Theory and 45 Hours Practical)
CREDIT VALUE:	4
PREREQUISITES:	
YEAR/SEM.:	YEAR 2, SEMESTER 3
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is aimed at providing the learner with information that is aligned to erecting various types of roofs at international standards. The course will allow the learner to interface with mathematical principles to calculate critical information that is related to creating roof structures for various buildings.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. Construct roof structures according to international standards
2. Applying mathematical principles and concepts to determine the pitch and run of various roof structures
3. Appreciate the importance insulation and ventilation for various roof structures
4. Apply appropriate finishes to roofs according to building code regulations

UNIT I: CREATING ROOF STRUCTURES 15 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.0 List the types of timber roof structures

1.1 Point-out the important features of each type of roofs

1.2 Examine the characteristics of the three(3) categories of single roofs

1.3 Practice creating models of single, double, trussed roof and trussed rafter roof according to building code regulations

Content

To include but is not limited to:

- Types of Roof Structures
  - Single Roofs
  - Double Roofs
  - Trussed Roofs
  - Trussed Rafter Roofs
- Features of Roof Structures
  - Single Roof
    1. Common Rafter
    2. Ridge
    3. Wall Plate
  - Double Roof
    1. Common Rafter
    2. Ridge
    3. Purline
    4. Wall Plate
  - Trussed Roof
    1. Hanger
    2. Common Rafter
    3. Ridge
    4. Purline
    5. Wall Plate
    6. Strut

7. Binders
8. Ceiling Joist

- Trussed Rafter Roof
  1. Common Rafter
  2. Struts
  3. Gand Nailed Plates
  4. Ceiling Joist

- Rafters
  - Common rafters
  - Jack rafters
  - Valley jack rafters
  - Hipped rafter
  - Hipped jack rafters
- Characteristics for the Types of Single Roofs
  - Couple Roof
  - Collar Roof
  - Close Couple Roof

UNIT II: APPLYING MATHEMATICAL CALCULATIONS TO ROOF STRUCTURES 10 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 Define the following terms "roof span, "roof height or rise" and "roof pitch

2.2 Calculate the pitch and angle of a roof structure using the rise and span.

2.3 Explain the term "bevel"

2.4 Determine the length of the bevel of a common rafter according to building code regulations

2.5 Construct the verge of a gable roof using the ladder frame, barge board, soffit, fascia

2.6 Define the term "eave"

2.7 Outline the characteristics of flush, boxed/closed eaves

2.8 Construct the eave of a gable roof using various approaches according to building code regulations

2.9 Propose various ways of creating ventilation for roof structures

Content

To include but is not limited to:

- Definition of term:
  - Roof span
  - Roof height
  - Roof Pitch
  - Bevel
  - Eave
  - Angle of Roof
- Calculate the pitch and angle of a roof structure using the rise and span.
- Determine the length of the bevel of a common rafter according to building code regulations
- Construct the verge of a gable roof using the ladder frame, barge board, soffit, fascia
- Characteristics of flush, boxed or closed eaves
- Constructing Types of Eaves
  - Flush
  - Box or Closed Eaves
- Creating Roof Ventilation
  - Leaving a gap between the outer wall and the soffit
  - Using a proprietary ventilation strip
  - Using circular plastic ventilators set into the soffit board

UNIT III: DESIGNING DOUBLE ROOFS 15 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 Propose features of a double roof with hipped end according to building code regulations

3.2 Sketch the design of a valley construction using lay board for a double roof structure

3.3 Calculate the roof pitch for various double roof designs

3.4 Determine the roof member bevels and lengths by orthographic projection and roofing square

Content

To include but is not limited to:

- Features of Double Roof with hipped end
- Valley Construction'
- Calculation of Roof Pitch
- Calculations of Roof Member Bevels and Lengths
    - Orthographic Projection
    - Use Roofing Square – Steel Roofing Square with Adjustable Fence to calculate:
        1. Hip Run
        2. Hip Length and Cuts
        3. Hip Backing Bevel
        4. Hip edge Cut
        5. Purlin Edge Cut
        6. Purlin Side Cut

UNIT IV: APPLYING INSULATION AND FINISHES TO ROOF STRUCTURES 15 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 Appraise the characteristics of warm and cold roof structures

5.2 Use appropriate materials to construct a warm and cold roof structures

5.3 Provide at least ten (10) the properties of Ballytherm Polyisocyanurate insulation

5.4 Apply at least three (3) types of roofing finishes to roof structures

Content

To include but is not limited to:

- Construction of warm and cold roofs
- Ballytherm Polyisocyanurate insulation
- Roofing fininshes

UNIT V: CREATING SLAB ROOFS 15 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 Define the term "slab"

5.2 Judge the advantages and disadvantages of various types of slab roof structures

5.3 Outline the thickness for various roof slab structures

5.4 Sketch various types of slab roof structures

5.5 Construct various types of slab roof structures

Content

To include but is not limited to:

Define the term “slab”

Advantages and Disadvantages Slab Roof Structures

- Flat Slab
- Conventional Slab
    - One way Slab
    - Two way Slab
- Hollow Core Slab
- Hardy Slab
- Waffle Slab
- Dome Slab
- Post-Tension Slab
- Cable Suspension Slab
- Thickness for various roof slab structures

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INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips
- Field Activities
- Simulations

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1		Practical Assessment 1	20%
2		Practical Assessment 1	20%
3		Group Project	20%
4		Final Assessment	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

Nunnally, S.W. (2011). Construction Methods and Management (8th Edition.).Upper Saddle River, New Jersey.

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRCUTION SITE MANAGEMENT
COURSE NAME:	PRACTICING NATIONAL BUILDING CODES AND REGULATIONS
COURSE CODE:	CSMBCR218S3
COURSE HOURS:	45 HOURS (45 Hours Theory)
CREDIT VALUE:	3
PREREQUISITES:	[NONE / COURSE NAME]
YEAR/SEM.:	YEAR 2, SEMESTER 3
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course will create within each student an awareness of changes, regulations and legislations process of design, development control and construction project relating to local building code and the town and country planning act.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

1. Explain the functions and responsibilities of public consultation on planning matters
2. Discuss the legislative framework for town and country planning for a local Area
3. Recognize the relationships between the planning policy and the infrastructure as required
4. Examine the process involved in approving building applications by the Local Building
5. authorities
6. Discuss the role of the Building Inspector
7. Outline the role of the Commission of Strata Corporations as it relates to the development and maintenance of multi-dwelling complexes.

UNIT I: GENERAL PUBLIC HEALTH AND SAFETY REQUIREMENTS 8 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 Examine the characteristics of commercial and industrial buildings.

1.2 Discuss the various building groups, types, classification by construction.

1.3 Assess the fire resistance rating for building special provisions.

1.4 Determine the occupancy content of a building

1.5 Propose areas of escape for various building designs according to the building code regulation

1.6 Determine the location and quantity of staircases and ramps

1.7 Examine the features and design of an automatic sprinkler system used to mitigate fires

1.8 Outline the fire resistance rating for materials.

1.9 Support the role of the Bureau of Standards Jamaica while preparing to begin a construction project

1.10 Value the statutory role of the building inspectors

1.11 Outline the role of the Commission of Strata Corporations as it relates to the development and maintenance of multi-dwelling complexes.

1.12 Examine the checklist used by the National Environment and Planning Agency when initiating new construction projects

1.13 Contrast the terms "building regulations" and "building codes" and indicate there relevance to the development and sustainability of the construction industry

1.14 Examine inspector's checklist that builders/ developers should adhere to in order to get approval for construction

1.15 Discuss the requirement for key features of a building according to the National Building Code.

Content

To include but is not limited to:

- General; Public Health and Safety Requirements
- Fire Protection System Escape and exits
- Material and Construction Standards

- The Role of the following:
    - Building Inspector
    - National Environment and Planning Agency
    - Commission of Strata Corporations
    - Bureau of Standards Jamaica
- Occupancy Content
- Location and quantity of staircases and ramps
- The differences between "building regulations" and "building codes"
- inspector's checklist
- Key features of a building according to the National Building Code:
    - Natural light and ventilation
    - Minimum areas and dimensions of habitable rooms
    - Seating arrangement of public assembly
    - Private stairways/common stairways

UNIT II: STRUCTURAL REQUIREMENT 8 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 Identify the various types of dead and live loads within a building

2.2 Determine how dead and live loads may impact the structural integrity of a building

2.3 Examine the advantages and disadvantages of various foundation types used in construction

2.4 Illustrate the how soil investigation can determine the choice of foundation.

2.5 Propose the international tests used to determine the quality and strength of blocks used for masonry construction.

2.6 Examine the importance of reinforce concrete and structural steel used in the construction industry

2.7 Examine the standards for materials used in the construction industry

Content

To include but is not limited to:

- Types of dead and live loads

- Impact of live loads and dead loads on structural strength
- Foundation types used in construction
- Soil investigation and choice of foundation.
- International Tests on blocks
    - Tensile Strength Test
- Importance of reinforce concrete and structural steel
- Standards for Construction Materials
    - Blocks
    - Cement
    - Steel
    - Bamboo
    - Granite

UNIT III: SERVICES REQUIREMENTS 10 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 Examine the processing of electrical, magnetic, and optical materials used in the construction

3.2 Discuss applications and specifications of the following:

- Electrical Installations
- Heating Ventilation and Air Conditioning Systems
- Heating and Cooking Installations

Content

To include but is not limited to:

- Processing of Electrical, Magnetic and Optical Materials
- Electrical Installations Requirements
- Heating Ventilation and Air Conditioning Systems Requirements
- Heating and Cooking Installations Requirements

UNIT IV: SOUND INSULATION 8 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1. Differentiate between sound and noise

4.2. Propose various ways in which sound is detected and measured

4.3. State the unit of sound absorption

4.4. Evaluate which materials are best suited for sound barriers according to international standards

4.5. Propose ways in which sound can be controlled within various buildings/structures

4.6. Sketch an annotated diagram depicting how materials and acoustics elements are formulated to capture sound

4.7. Outline the required Decibels and Sabin for noise according to building code regulations

Content

To include but is not limited to:

- Differences between sound and noise
- Unit for Sound Absorption – Sabin
- Materials used as Sound Barriers
- Ways to control sound
- Building Code Regulations for Required Decibels and Sabin

UNIT V: ADHERING TO REAL ESTATE REQUIREMNTS 8 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 Define the terms “personal property”, “real property”, “title”, “possession” and “adverse possession”

5.2 Distinguish between “ownership” and “possession”

5.3 Examine the characteristics of various types of titles existing within the real estate sector

5.4 Assess the various rights existing within the real estate sector

5.5 define the term “easement”

5.6 Propose the essential components of an easement

5.7 Justify the process of creating an easement

5.8 apply land law in case scenarios

Content

To include but is not limited to:

- Definition of terms:
    - personal property
    - real property
    - title
    - possession
    - adverse possession
- Differences between “ownership” and “possession”
- Characteristics of various types of titles existing within the real estate sector
- Rights existing within the real estate sector
- Easement
    - essential components of an easement
    - process of creating an easement
- Application of land law in case scenarios

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INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips
- Field Activities

- Simulations

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1		Practical Assessment 1	20%
2		Practical Assessment 1	20%
3		Group Project	20%
4		Final Assessment	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

Nunnally, S.W. (2011). Construction Methods and Management (8th Edition.).Upper Saddle River, New Jersey.

FACULTY OF COMPUTER SCIENCE AND ENGINEERING	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE CONSTRUCTION SITE MANAGEMENT
COURSE NAME:	DETERMINING BILLS OF QUANTITIES FOR SUB-STRUCTURES
COURSE CODE:	CSMSUB219S3
COURSE HOURS:	45 HOURS
CREDIT VALUE:	3
PREREQUISITES:	[NONE / COURSE NAME]
YEAR/SEM.:	YEAR 2, SEMESTER 3

COURSE DESCRIPTION

This course is designed to introduce students to the working knowledge of measurement of building works in accordance with the Standard Method of Measurement. The course will expose students to takeoff quantities and to become familiar with quantity surveying duties and terminology including billing. The understanding of this course will allow students to prepare the bill of quantity for the substructure of any building.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students are competent when they are able to:

1. Appreciate documents forming the bills of quantity for the various areas of construction understand the differences between substructure and superstructure
2. Provide a basis for the valuation of variations which often occur during the progress of the work.
3. Assist contractor in ordering materials and assessing the labour requirements for the contract.

4. Provide a good basis for a cost analysis, which can be used on future contracts in cost planning work
5. Prepare a bill of quantity

UNIT I: TAKE-OFF BUILDING MEASUREMENT 10 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1. Differentiate between an estimate and guesstimate
1.2. Explain the basic skills that an estimator most posses
1.3. Carry out basic calculation on the different types of estimating
1.4. Explain how error can occur during estimating
1.5. Propose various costs associated with a construction project
1.6. Explain four purposes for the bill of quantity
1.7. identify the various documents within a bill of quantity
1.8. list the processes involved in preparing a bill of quantity
1.9. use measurement procedure in tabulating the dimension sheet
1.10. properly format a dimension sheet: a. Titling b. Titling of dimension sheet column c. Abbreviations and spacing d. Units application
1.11. Complete operations with underline or strike through
1.12. Explain what is a checklist
1.13. Explain schedule and its importance
1.14. State the general rules when taking off
1.15. List the sequence of taking off for a substructure of a building
1.16. Explain the use of the Standard Method of Measurement of Building works.

Content

To include but is not limited to:

- Differentiate between an estimate and guesstimate
- Basic skills of an estimator
- Ways in which an error can occur during estimating
- Examples of costs associated with a construction project
- Purposes for the bill of quantity

- Processes involved in preparing a bill of quantity
- Format a dimension sheet
    - Titling
    - Titling of dimension sheet column
    - Abbreviations and spacing
    - Units application
- Addressing operations with underline or strike through
- Checklist
- Schedule and its importance
- General rules when taking off
- Sequence of taking off for a substructure of a building

UNIT II: MEASURE BUILDING SUBSTRUCTURE OPERATIONS 10 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1. Define the terms " mean girth"," set back or recess"

2.2. Perform calculations to assess the materials required during a site preparation

2.3. Compute the excavation to reduce level in substructure

2.4. Determine the mean girth of rectangular building

2.5. Estimate the mean girth of irregular buildings

2.6. Evaluate the excavation in foundation trenches

Content

To include but is not limited to:

- Calculation of
    - Site Preparation
    - Excavation
    - Mean Girth
    - Excavation

UNIT III: CALCULATE EARTH WORK, HARDCORE AND CONCRETE 10 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 Determine the quantity of backfill for a construction project

3.2 Compute the level and compact bottom of foundation trenches

3.3 Determine hardcore to floor slab

3.4 Evaluate concrete to floor slab

3.5 Determine concrete in foundation footing

Content

To include but is not limited to:

- Calculation to determine:
    - Backfill
    - Hardcore
    - Concrete
    - Concrete in Foundation Footing

UNIT IV: CALCULATE EARTHWORK AND REINFORCEMENT IN SUBSTRUCTURE 10 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1. Calculate adjustment to soil disposal

4.2. Explain the taking-off process in substructure for steel work

4.3. Calculate blockwork

4.4. Calculate the quantity of material for steelwork

4.5. Calculate quantity of material for formwork

Content

To include but is not limited to:

- Calculate the following:
    - Soil Disposal
    - Blockwork
    - Steelwork
    - Formwork

UNIT V: PREPARE BILL OF QUANTITIES AND BILL SHEETS 10 HOURS

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

5.1 Explain the use of prime cost, provisional sum and contingency sum

5.2 Transfer data to abstract sheet

5.3 Compute information in standard format on the abstract sheet

5.4 Complete costing using unit rates

5.5 Transfer data to bill sheet

Content:

To include but is not limited to:

- Abstract Sheet
- Bill Sheet

INSTRUCTIONAL METHODS

- Practical Demonstration
- Lectures
- Group discussion
- Field Trips
- Field Activities
- Simulations

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1		Assessment 1	10%
2		Assessment 1	10%
3		Individual Project	40%
4		Final	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCES

1. Feigenbaum, L., & Dagostino, R. F. (2002). Estimating in Building Construction (6th ed). New Jersey, NJ: Prentice Hall.
2. Pratt, D. (2010). Fundamentals of Construction Estimating (3rd ed.). Florence, KY: Delmar Cengage Learning.

FACULTY OF NURSING AND COMMUNITY HEALTH CARE	
PROGRAMME:	OCCUPATIONAL ASSOCIATE DEGREE IN GERIATRIC CARE
COURSE NAME:	USING CONVERSATIONAL SPANISH
COURSE CODE:	**GCSPA109S2**
COURSE HOURS:	30 HOURS
CREDIT VALUE:	2
PREREQUISITES:	NONE
YEAR/SEM.:	YEAR 1, SEMESTER 2
APPROVED BY:	CENTRE OF OCCUPATIONAL STUDIES

COURSE DESCRIPTION

This course is planned for students with little or no familiarity to Spanish, and wishes to be able to converse in the language about day-to-day situations at a basic to intermediate level. It therefore introduces students to the communicative functions and structures of the Spanish language through developing the four skills of listening, speaking, reading and writing, as well as exposure to different aspects of Hispanic culture. It is prearranged around 4 units that facilitate the use of the target language to identify, describe and characterize people, objects, places and events, and expressions of feelings and ideas. Classes will include situational role-play and responses, reporting, mini-dialogues, memorizing short poems, songs, games etc. and preparing simple materials in the target language. In addition, there will be the use of authentic materials, magazines, brochures, videos, DVDs, cassettes, broadcasts from Spanish television stations and access to interactive online programmes.

LEARNING OUTCOMES AND INSTRUCTIONAL OBJECTIVES

Upon completion of this course, students will be able to relate to concepts, theories and techniques, which are studied; develop and practice a range of technical competencies, personal competencies and social competencies; identify and develop career paths within their industry. It will also encourage students to develop important employability skills, make contacts with potential employers and construct work experience profiles commensurate with the demands of future employers and explore entrepreneurial opportunities.

Upon completion of this course, students are competent when they are able to:

1. converse meaningfully on a variety of topics in Spanish;
2. respond appropriately to written material such as short statements, notices, signs and e-mails related to their lives and experiences;
3. write simple dialogues relevant to their lives and experiences
4. enact simple dialogues relevant to their lives and experiences;
5. present information on a variety of topics delivered in Spanish;
6. participate in planned activities of the Spanish culture in the Caribbean and Latin America.

UNIT I: GREET CLIENTS 8

Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

1.1 recite greetings/welcome.

1.2 greet/welcome individuals

1.3 bid farewell to different individuals.

1.4 introduce self and others

1.5 respond to introductions, paying attention to name, age, address and nationality

Content

The content should include but is not limited to:

- Forms of welcoming and greeting
- Forms of salutation

- Introductions of self, co-workers, staff
- Name, age, date of birth: months, days and year
- Address and nationality
- Pronunciation of the Spanish alphabet

UNIT II: DESCRIBE SELF AND OTHERS 6

Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

2.1 introduce self, giving name, and other pertinent details

2.2 describe occupations and business interest.

2.3 exchange information

2.4 prepare information about the geriatric care program

Content

The content should include but is not limited to:

- Physical description and personal trait
- Occupations and businesses
- Components of a fitness program

UNIT III: DESCRIBE SCHOOL AND DAILY ROUTINE 8

Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

3.1 discuss various subjects taken at school.

3.2 exchange opinions or information on teachers and school environment

3.3 compare a typical day in their lives

Content

The content should include but is not limited to:

- Subjects done at school
- The teacher and the school environment

- A typical day at school/daily life

UNIT IV: DESCRIBE OCCUPATIONS, PROFESSIONS & FUTURE PLANS 8 Hours

Specific Objectives

Upon completion of this unit, students are competent when they are able to:

4.1 exchange information about occupations and professions

4.2 communicate in a simple language about occupations, careers and future plans

4.3 listen to interviews and conversations related to various occupations, careers and future plans

4.4 express basic ideas and opinions about various professions and future plans

Content

The content should include but is not limited to:

- Occupation/profession
- Future plans
- Career preferences

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INSTRUCTIONAL METHODS

- Lecture/Demonstration
- Role Play
- Group work

ASSESSMENT PROCEDURES

Students will take responsibility for their own academic achievement. Students will demonstrate their commitment to their own goal of educational advancement by attending classes, completing assigned work, and complying with existing copyright legislations. To successfully complete this course, a student must pass **ALL** the different components of the course.

On-going Assessment Requirements			
No.	**Suggested Unit/Unit Cluster**	**Assessment Strategy**	**Weight**
1		Oral Assignment	20%
2		Written Assignment	20%
3		Group Project	20%
4		Final Assessment	40%
Total			**100%**

FEEDBACK

Students will be given analytic rubric within the first contact period of the course. Each student will also be given written and oral feedback. Feedback will be immediate and no longer than one week after a task is assessed. Feedback may be documented on assessment evidence.

RESOURCE

1. Britton, J., Haylett, C., & Leacock, M., et.al. (2007). *Que Hay. Book 1*. Nelson Thornes Publishers
2. Carter, S. (*2001). Functional Spanish for Caribbean students.* Ian Randle Publishers.
3. Garcia, N. A. & McMinn, J. T. (2006). *TratoHecho: Spanish for real life.(*3rd ED). New Jersey: Prentice Hall.
4. Lebredo, J. (1981). *Basic Spanish grammar workbook*. Heath & Co.: Toronto
5. Lewis, M.J.; Nelson- Springer, Y. &Padmore, E. (2003). *Dime*. .Macmillan Caribbean
6. Lewis, M.J.; Nelson- Springer, Y. &Padmore, E. (2003). *Dime mucho*. Macmillan Caribbean.
7. Nassi, R. J. & Levy, S.L. (2001). *Spanish two years. Workbook Edition.* New York. Amsco School Pubilcations.
8. Smith, R. (2010). *Hablemos CXC Spanish oral examination manual.* Jamaica.