

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA



## **CURRICULUM GUIDE**

### **OCCUPATIONAL ASSOCIATE DEGREE IN CONSTRUCTION SITE MANAGEMENT**



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## Acknowledgement

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## Table of Contents

<a href="#">1. Background</a>	5
<a href="#">2. Programme Rationale</a>	6
<a href="#">3. Programme Description</a>	7
<a href="#">4. Programme Goals</a>	8
<a href="#">5. Matriculation Requirements</a>	9
<a href="#">6. Target Group</a>	10
<a href="#">7. Programme Duration</a>	10
<a href="#">8. Programme Review Alignment Summary</a>	11
<a href="#">9. Programme Structure</a>	15
<a href="#">10. Programme Structure – Semester Table</a>	19
<a href="#">11. Programme Profile</a>	20
<a href="#">12. Delivery and Learning Strategies</a>	23
<a href="#">13. Evaluation and Assessment Strategies</a>	24
<a href="#">14. Grading Scheme</a>	26
<a href="#">15. Graduate Profile</a>	26
<a href="#">16. Employment/Career Opportunities</a>	27
<a href="#">17. Course Descriptions</a>	31
<a href="#">18. Programme Requirements</a>	32
<a href="#">19. References</a>	34

## 1. Background

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The Ministry of Education Youth and Information seeks to reduce the unemployment rate of unattached and socially delinquent youth within the country. The ministry has launched the Sixth Pathway Programme, which gives students an opportunity to achieve certification without using the traditional approach. This method will allow students to attain a certification at the secondary level at a significantly lower cost than the traditional method. The ministry has provided three pathways under the programme for students to attain a certified skill.

As the country recognized the shortage of construction workers within the construction industry (The Gleaner, 2022) and the contribution of the construction sector to the economy is at an average a 7.2% of the country's GDP (JIS 2018). It is very relevant for the Construction Site Management programme to be a part of the Sixth Pathway Programme to increase the work force in the various areas of the construction industry as site supervisor, clerk of works, draughting technician, general contractor, building officer, foreman, and tradesmen.

## 2. Programme Rationale

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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 %. Some 90.7 % of the poorest in the population had no certification while among the wealthiest, the figure was 53.5 %. Non-certification among the Prime Working Age (25 – 29) was at 70.1 %, males with no certification was 77.1 % and females were 64.0 %. In the Kingston Metropolitan Area, the number of people without formal certification was 39.4 %.

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 rationale 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.

### 3. Programme Description

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The Construction Site Management programme is a two- year Associate Degree with a total of 72 credits that seeks to provide learners with technical, theoretical, and management skills that will lead to employment and further studies in the field of the built environment. Graduates will add value to the work force in the various areas of the Construction Industry as site supervisor, clerk of works, draughting technician, general contractor, building officer, foreman, and tradesmen.

The programme covers General Education Competencies, Technical Core Competencies and Electives. The various competencies will expose learners to real life solutions to solve problems. In the final year of the programme, learners are able to apply the various principles, competencies, technologies and knowledge gained over the period within their Capstone project. This project will help learners to develop a holistic appreciation and application of the programme.

Upon successful completion of the two (2) year programme, graduates will be awarded an Occupational Associate Degree which will be accredited by the Council of Community Colleges of Jamaica (CCCJ) and University Council of Jamaica (UCJ). If only the first year is successfully completed, then the graduates can be awarded a certificate from the Council of Community Colleges of Jamaica (CCCJ) only.

## 4. Programme Goals

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Upon successful completion of this programme, learners will be able to:

1. Demonstrate high level of practical competencies in technical areas which are in alignment with industry standards.
2. Interpret construction drawings which meet industry standards.
3. Develop management skills to execute a project from conception to close out.
4. Apply occupational health and safety within the operational tasks that meets industry regulations.
5. Develop good communication skills to effectively communicate with both external and internal customers.

## 5. Matriculation Requirements

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

- NVQJ or CVQ – Level 2 Certification
- Other Academic Entry Requirements – in accordance with CCCJ's entry requirements.
- Prior Learning Assessment Recognition
- 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 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.



## 6. Target Group

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This programme targets any of the following individuals:

1. High school graduates interested in the careers in Construction Site Management.
2. Students who want to change their career path.
3. Students who dropped out of school before completing Grade 11 and meet the requirement.
4. Students who discontinue a sixthform pathway programme and want to be re- admitted and meet the requirement.
5. Individuals who have worked in the industry desiring formal training and certification.

## 7. Programme Duration

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The programme may be offered as follows:

Schedule	Duration	Days Offered
Full-time	Four (4) semesters (2 years)	Weekdays, evenings, and weekends. Flexibility is applied based on preference of target group.

## 8. Programme Review Alignment Summary

Programme Structure	Changed the number of credits from 89 to 71. Reduced the number of courses from 29 to 23. Added Part- time programme structure.
Background	Background information added.
Programme Rationale	Rationale information added.
Programme Description	Programme description information added.
Programme Goals	Programme goals information added.
Programme Duration	Part time duration was adjusted.
Target group	Target group information added.
Course Listing	Course listing information added.
Course Description	Course description information added.
Practicing Occupational Health and Safety	<p>Course Outcome - Objective 1 verb was changed from understand to explain, Objective 10 verbs were changed from detect and prevent to identify, Objective 13 verb was changed from manage to assess.</p> <p>Objective 11, 12,14 &amp;15 were removed.</p> <p>Unit I - hours changed from 9 hours to 6 hours, Objective 1.3 was removed, Objective 1.4 is separated to create two (2) objectives. Objective 1.7 words “awareness and” were removed, Objectives 1.8, 1.9, 1.11, 1.12 &amp; 1.14 were removed. Objective 1.13 verb “adhere” was changed to research.</p> <p>Unit I Content - Topics 8, 9, 11 &amp; 13 were removed.</p> <p>Unit II – hours changed from 9 hours to 6 hours.</p> <p>Unit II - Objective 2.8 was removed.</p> <p>Unit II Content – Topic 7 was removed.</p> <p>Unit III – Objective 3.2 was removed.</p> <p>Objective 3.3 words “and explain” were removed.</p> <p>Objectives 3.4,3.5, 3.6, 3.9 &amp; 3.10.</p>

	<p>Unit III Content - Topic 4 was removed.  Unit IV – Objectives 4.1,4.2,4.5 &amp; 4.7 were adjusted.  Unit IV Content – Topic 4 was removed.  Unit V – Objectives 5.1 &amp; 5.5 were adjusted.  Objectives 5.9 &amp; 5.12 were removed.</p>
<p>Preparing Sites &amp; Carry Out Steel-Fixing</p>	<p>Change credit hours from 45 hours to 75 hours.  Course description adjusted.  Course outcomes - Objectives 1, &amp; 2 were adjusted.  Objective 5 was removed, and two new objectives were added.  Unit I - Objectives 1.3, 1.5 &amp; 1.6 were removed.  Unit I Content - topics 3 &amp; 6 were removed.  Unit II - was removed.  Unit III - (Now becomes Unit - II).  Unit III - Objectives - 3.3, 3.4, 3.7, 3.10 were removed.  Unit III - Objectives - 3.6, 3.9 &amp; 3.11 were adjusted.  Unit III - (Content Adjusted).  Unit IV - 2 new objectives were added, objectives 4.2 &amp; 4.4 were adjusted.  Unit IV Content were adjusted.  Unit V objectives were adjusted.  Method of delivery – Adjusted.  Method of assessment &amp; Evaluation – Adjusted.  Online resources added.</p>
<p>Preparing Geometric Drawings &amp; Sketches</p>	<p>Course hours changed from 45 hours to 75 hours.  Course description adjusted.  Course outcomes – All were changed.  Unit I - Objectives 1.1 &amp; 1.2 were adjusted.  Unit I Content was adjusted.  Unit II was removed.  Unit III – information placed into current Unit II.  Unit IV removed.  Unit V – information placed in the new Unit III.  Unit VI removed.  Created new Unit III and IV.  Method of assessment &amp; Evaluation – Adjusted.  Online resources added.</p>
<p>Using Drawing Technologies 1 (AutoCAD)</p>	<p>Course hours changed from 45 hours to 75 hours.  Unit I – Objective 1.4 was adjusted.  Instructional Methods adjusted.  Method of assessment &amp; Evaluation – Adjusted.  Online resources added.</p>

Erecting Concrete Structure	<p>Course description adjusted.</p> <p>Course outcome adjusted.</p> <p>Unit II – Objective 2.3 adjusted.</p> <p>Method of assessment &amp; Evaluation.</p> <p>Prescribed Text stated.</p> <p>Resource book removed.</p> <p>Online resources added.</p>
Erecting Wooden Structure	<p>Course Description adjusted.</p> <p>Course outcomes adjusted.</p> <p>Unit 11 removed.</p> <p>Method of assessment &amp; Evaluation – Adjusted.</p> <p>Prescribed Text added.</p> <p>Online resources added.</p>
Performing Construction Project Planning Techniques	<p>Course outcomes adjusted.</p> <p>Unit II Objectives 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, &amp; 2.14 were removed.</p> <p>Unit II Content was adjusted.</p> <p>Unit III Objectives 3.2, 3.5, &amp; 3.6 were removed.</p> <p>Unit III Content adjusted.</p> <p>Unit IV Objective 4.2, 4.10, &amp; 4.12 were removed.</p> <p>Unit IV Content adjusted.</p> <p>Unit V Content adjusted.</p> <p>Unit VI removed.</p> <p>Method of assessment &amp; Evaluation – Adjusted.</p> <p>Online resources added.</p>
Performing Site Surveying	<p>Course outcomes were adjusted, Objective 5 removed.</p> <p>Unit IV removed.</p> <p>Method of assessment &amp; Evaluation – Adjusted.</p> <p>Online resources added.</p>
Erecting Roof Structures	<p>Course outcomes – Objective 3 adjusted.</p> <p>Course description adjusted.</p> <p>Course outcomes – Objective 3 adjusted.</p> <p>Unit I - Objectives 1.0 &amp; 1.3 were adjusted.</p> <p>Unit II – Objective 2.2 adjusted.</p> <p>Unit III – Removed.</p> <p>Unit IV – Objective 5.1 adjusted.</p> <p>Unit V – Removed.</p> <p>Method of assessment &amp; Evaluation – Adjusted.</p>

<p>Practicing National Building Codes and Regulations</p>	<p>Course outcomes adjusted.  Unit I Objectives 1.6 &amp; 1.10 were removed.  Unit II – Objectives 2.2, 2.3, 2.4 &amp; 2.5 were adjusted.  Unit III Objective 3.2 adjusted.  Unit IV – Objectives 4.2, 4.3, &amp; 4.7 were adjusted.  Unit V adjusted.  Prescribed Text added.  Method of assessment &amp; Evaluation – Adjusted.</p>
<p>Determining Bills of Quantities for Substructures</p>	<p>Unit I – Objectives 1.3, 1.5, 1.11, 1.12, &amp; 1.13 were removed other objectives were adjusted.  Unit II - Topic adjusted, Objective 2.2 removed.  Unit II adjusted.  Unit III adjusted.  Unit III content adjusted.  Unit IV Objectives 4.4 &amp; 4.5 were adjusted.  Method of assessment &amp; Evaluation – adjusted.  Prescribed Text added.</p>

## 9. Programme Structure

Curriculum Courses/ Modules	Modules/ Course Codes	Number of Credits	Theory Hours	Lab/ Practical Hours	Pre-requisites
Fundamentals of Information Technology	ITEC1104	3	30	45	None
Communication I	COMM1101	3	45	-	None
Mathematical Operations	OMAT1100	3	45	-	None
Practicing Occupational Health, Safety Requirement	CSOH1100	3	45	-	None
Preparing Sites and Carry Out Steel-fixing	CSSS1101	3	30	45	None
Preparing Geometric Drawings and Sketches	CSGS1102	3	30	45	None
Promoting Customer Service and Workplace Relationships	CSWR1104	3	45	-	None
Erecting Concrete Structures	CSCS1208	4	30	90	Preparing Sites and Carry Out Steel-fixing
Using Drawing Technologies 1 (AutoCAD)	CSDT1209	4	30	90	Preparing Geometric Drawings and Sketches
Erecting Wooden Structures	CSWS1210	4	30	90	None
Communication II	COMM1202	3	45	-	Communications I
Applying the Principles of Physics and Chemistry to Construction	CSPC1213	3	45	-	None
Performing Site Surveying	CSSP2115	4	30	90	

Erecting Roof Structures	CSRS2116	4	30	90	Erecting Wooden Structures
Practicing National Building Codes and Regulations	CSBR2119	3	45	-	None
Determining Bill of Quantities for Substructure I	CSBQ2119	3	45	-	Preparing Sites and Carry Out Steel-fixing
Applying Building Finishes	CSBF2120	4	30	90	Erecting Wooden Structures
Determining Bills of Quantities for Superstructure II	CSBQ2222	3	45	-	Determining Bill of Quantities for substructure
Performing Construction/Project Planning Techniques	CSCT2224	3	30	45	None
Acquiring Professional and Industry Certification	CSPI1100	1	-	45	None
Conducting a Major Capstone Project	CSMC1100	2	-	90	Complete all courses
Internship/Externship (Work Attachment)	CSIE1100	6	-	240	Complete all courses



**10. Programme Structure – Semester Table****(FULL TIME)****YEAR 1****Semester I**

<b>CODE</b>	<b>COURSE</b>	<b>CREDITS (HOURS)</b>
ITEC1104	Fundamentals of Information Technology	3 (75)
COMM1101	Communication I	3 (45)
OMAT1100	Mathematical Operations	3 (45)
CSOH1100	Practicing Occupational Health, Safety Requirement	3 (45)
CSSS1101	Preparing Sites and Carry out Steel-fixing	3 (75)
CSGS1102	Preparing Geometric Drawings and Sketches	3 (75)
<b>Total</b>	<b>6</b>	<b>16</b>

**Semester II**

<b>CODE</b>	<b>COURSE</b>	<b>CREDITS (HOURS)</b>
CSWR1104	Promoting Customer Service and Workplace Relationship (Elective)	3 (45)
CSCS1208	Erecting Concrete Structures	4 (120)
CSDT1209	Using Drawing Technologies 1 (AutoCAD)	4 (120)
CSWS1210	Erecting Wooden Structures	4 (120)
COMM1202	Communication II	3 (45)
<b>Total</b>	<b>6</b>	<b>18</b>

## YEAR 2

### Semester III

CODE	COURSE	CREDITS (HOURS)
CSPC1213	Applying the Principles of Physics and Chemistry to Construction	3 (45)
CSSP2115	Performing Site Surveying	4 (120)
CSRS2116	Erecting Roof Structures	4 (120)
CSBR2119	Practicing National Building Codes and Regulations	3 (45)
CSBQ2119	Determining Bill of Quantity for Substructure	3 (45)
CSBF2120	Applying Building Finishes	4 (120)
<b>Total</b>	<b>6</b>	<b>21</b>

### Semester IV

CODE	COURSE	CREDITS (HOURS)
CSBQ2222	Determining Bills of Quantity for Superstructure	3 (45)
CSCT2224	Performing Construction/Project Planning Techniques	3 (75)
CSPI2202	Acquiring Professional and Industry Certification	1 (45)
CSMC1100	Conducting a Major Capstone Project	2 (90)
USEK1100	Using Social and Employability Skills	3 (45)
CSIE1100	Internship/Externship (Work Attachment)	6 (240)
<b>Total</b>	<b>5</b>	<b>18</b>

## 11. Programme Profile

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In addition to core content, there are some components that will be infused into the programme to promote holistic development of graduates. Infusion of these elements will be done through such strategies as presentations, seminars and workshops and will not affect the length of the programme. The programme features the following components: -

- **Work Experience/ Practicum** Learners are required to complete six (6) weeks (240 hours minimum) of industry attachment/practicum or work experience during the training. The hands-on nature of the teaching and learning process ensures that learners complement their knowledge with practical skills. This will provide an opportunity for them to apply and strengthen the knowledge, skills and attitudes acquired during their training in the programme.
  
- **Entrepreneurship** The programme aims to continue the development of entrepreneurial competencies of graduates, including their level of creativity and innovation to enable them to successfully operate a business venture and/or create new products/services, which should ultimately lead to the creation of employment and wealth for self and others. The focus of this component will be:
  - Applying knowledge of financial requirements for operating a business.
  - Demonstrating knowledge of production and operations management.
  - Outlining principles and practices of business law.
  
- **Employability Skills** The programme promotes development of the following critical employability skills:
  - Communication
  - Professionalism and Ethics

- Teamwork
- Problem Solving and Critical Thinking
- Leadership
- Planning and Organizing
- Appreciation of Diversity

- **STEAM**

The programme is designed to produce graduates of the highest caliber who are not only able to function effectively and efficiently in the workplace but are also able to make significant contributions to the growth and development of their workplaces and the industry. As such, the courses incorporate relevant aspects of Science, Technology, Engineering, Arts and Mathematics (STEAM) in real-world and problem-based contexts. This supports the development of graduates who possess critical 21<sup>st</sup>-century skills that drive innovation. The core STEAM Skills include the following:

- Inquiry
- Communication
- Self-direction
- Problem Solving
- Creativity and Innovation
- Collaboration
- Analysis and Critical Thinking
- Applications of technology

- **Foreign Language**

The programme includes a conversational course in Spanish, or German, Mandarin or French. It is intended to introduce learners to the fundamentals of the foreign language (phonics, grammar, syntax, vocabulary, etc.) and culture. The focus of the course is conversational competence. This will equip graduates to communicate competently at this level in a foreign language in current and emerging labour markets.

- **Gender Sensitivity** The programme is designed to produce graduates who are conscious of the need to avoid gender stereotyping and making gender distinctions that limit the roles of men and women based on sex or gender.
- **Cultural Diversity/Sensitivity** The programme is designed to produce graduates who are sensitive to the cultural diversity within the wider society. Learners are encouraged to have an appreciation of the need to coexist in an institution with variations in religion, ethnicity, racial and socio-economic situations. Learners should understand how to be tolerant and to be accommodating to persons of other cultures.
- **Sustainable Environmental Practices** Learners are required to develop awareness of environmental issues and their correlation with sustainable development. Sustainability and current environmental practices must be infused in training and in practice. Examples of areas that should be included are: protection of the environment, optimizing use of resources and ensuring use of environmentally friendly products and methods of waste disposal.

## 12. Delivery and Learning Strategies

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The methods of delivery or modes of instruction and learning are expected to deliver/facilitate content appropriate to the subject area and learning styles of students to ensure that course

objectives are met. The teaching-learning strategies to be employed will incorporate relevant and current technologies and will also include but are not limited to:

- Interactive lectures
- Simulations
- Demonstrations
- Project-based learning
- Field-based learning
- Case studies and Analysis
- Role plays
- Research
- Observations
- Presentations
- Laboratory exercises
- Self-directed learning
- Problem solving
- Discussions
- Guided practice
- Guest Lectures

**The delivery and learning strategies/modes of instruction are intended to:**

1. increase the independence of the learner
2. create critical thinkers
3. equip learners to enter the corporate world or start their own business
4. assist the learner to:
  - a. develop research skills
  - b. analyze and evaluate data
  - c. plan, design and implement projects

Faculty members or teams will determine for themselves the appropriate teaching/learning strategies for each curriculum unit, based on the intended learning outcomes, the needs of their learners and the availability of resources. It is intended that teaching/learning strategies utilized are those which encourage the progressive development of the learners' independent learning skills in all courses.

### 13. Evaluation and Assessment Strategies

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Evaluation of student learning is aligned with the stated intended learning outcomes for each course. This involves a multi-faceted approach which is used to assess students' critical thinking as well as attitudinal skills. For this reason, evaluation is a blend of practical and theoretical tasks divided in a pre-defined ratio<sup>1</sup> of coursework to end of semester examination<sup>2</sup>. In some cases, summative assessments will include both a skill assessment and knowledge assessment. The assessment strategies used will include, but are not limited to:

- |                                    |                                |
|------------------------------------|--------------------------------|
| i. Tests                           | Performance Tasks              |
| ii. Laboratory activities          | Demonstrations                 |
| iii. Field based assessment        | Portfolios                     |
| iv. Projects (individual or group) | Oral Reports and Presentations |
| v. Condensed or summary reports    | Graphical Displays             |
| vi. Self and peer evaluations      | Interviews                     |

#### a. Final Examination

In order to improve quality, all applicable General Education courses have a standardized examination. Within an academic year, there are typically three (3) examination sessions: December, May and August. The end-of-semester exam (Final Examination) will consist of a combination of the following:

- i. Multiple Choice Questions (MCQs)
- ii. Structured Questions (SQs)
- iii. Practical Assignments (PAs)

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<sup>1</sup> The applicable ratio of coursework to end of semester examination is found in the respective course outline <sup>2</sup>In reference to the end of semester examination (Final Examination), with duration of two (2) hours.

## 14. Grading Scheme

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### 1. Grading

Typically, a student's final grade is calculated by the combination of the course work grade and the final examination grade. The specific course outline can be consulted regarding the applicable grading scheme.

A student who attains a combined grade of:

- a. 50% or more is deemed to have passed the course.
- b. at least 45% but less than 49% is deemed to have failed the course, and qualifies for a supplemental examination<sup>3</sup>
- c. less than 44% is deemed to have failed the course and will be required to repeat the course in its entirety.

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<sup>3</sup>The supplemental examination must be done at the next available sitting within the current academic year. The grade received therein shall be the student's final grade for the course. A student who fails a supplemental examination is required to repeat the course in its entirety.

### Examination Grades, Points and Distribution

Effective Academic Year September 2014

Percentage Scale	Grade	Grade Point	Student Performance Description
90-100	A	4.00	<b>Excellent</b>
80-89	A-	3.67	
75-79	B+	3.33	<b>Good</b>
70-74	B	3.00	
65-69	B-	2.67	
60-64	C+	2.33	<b>Satisfactory</b>
55-59	C	2.00	
50-54	C-	1.67	
45-49	D+	1.33	<b>Marginal Fail – Re-sit</b>



40-44	D	1.00	<b>Fail – Redo</b>
0-39	U	0.00	<b>Unsatisfactory</b>

### **LEVELS OF AWARDS**

<b>BACHELOR OF SCIENCE</b>		<b>ASSOCIATE OF ARTS ASSOCIATE OF SCIENCE</b>	
G.P. A	Classification	G.P. A	Classification
3.70 - 4.00	First Class Honours	3.70 - 4.00	Honours
3.30 - 3.69	Second Class Honours (Upper)	2.70 - 3.69	Credit
2.70 - 3.29	Second Class Honours (Lower)		
1.70 - 2.69	Pass	1.70 - 2.69	Pass

## **15. Graduate Profile**

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Graduates from the O.A.D. in Construction Site Management programme should be:

1. Technologically competent
2. World-ready workers
3. Self-directed
4. Life-long learners
5. Critical thinkers
6. Problem-solvers
7. Socially and culturally aware
8. Contributors to community and national development
9. Team players
10. Possess excellent communication skills
11. Entrepreneurial
12. Environmentally aware
13. Gender inclusive
14. Ethical and professional

## **16. Employment/Career Opportunities**

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Possible career opportunities from this programme are:

1. Site supervisor
2. Site foreman
3. Building Officer
4. Assistant Facilities Manager
5. Clerk of Works
6. General Contractor
7. Draughting Technician

## 17. Course Descriptions

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### **Acquiring Professional and Industry Certification**

**(BWPI2202)**

This Professional Recognitions Development Programme is designed to provide the students with the opportunity to pursue professional and industrial recognition programmes which will lead them to acquire professional and or industry certification, licenses or licensure. These types of recognitions will, in addition, to their educational and or training institutional certification, gives them a high level of employment standing and competitiveness in their sector of employment and career paths. The student should be assigned a workplace mentor and or programme advisor who will facilitate and guide the student's goal achievements towards professional recognition. The students should be encouraged to commence these pursuits before completing their course of study.

### **Communication I**

**(COMM1101)**

This course is designed to encourage and assist the student in developing standard communication and presentation skills that are important to and necessary in the industry.

### **Communication II**

**(COMM1201)**

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

### **Determining Bill of Quantity for Substructures**

**(CSBQ2119)**

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 take off 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.

### **Erecting Concrete Structures**

**(CSCS1208)**

This course is designed to expose the learner to key principles and techniques employed to erect concrete structures in the 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.

**Erecting Roof Structures** (CSRS2116)

This course is aimed at providing the learner with information that is aligned to erect 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 create roof structures for various buildings.

**Erecting Wooden Structure** (CSWS1210)

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 wooden structures.

**Fundamentals of Information Technology** (ITEC1104)

This course is designed to provide students with a comprehensive knowledge of the application of computers in different organizations. It includes a thorough introduction to computers and information technology, information systems, computer networks and systems security. It also aims at equipping students with practical operating system, word processing, presentation, spreadsheet, database and Internet search techniques skills.

**Mathematical Operations** (OMAT1100)

This course is designed for students requiring minimal use of mathematical applications in their jobs. The topics included ensure numeracy and exposure to consumer arithmetic and statistics, a valuable tool in data presentation and report writing. Students are equipped with a basic yet sufficient knowledge, particularly of consumer/financial mathematics, among others, for advancement in their jobs and academically.

**Performing Construction Project Planning Techniques** (CSCT2224)

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.

## **Performing Site Surveying**

**(CSSP2115)**

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 levelling, as it relates to the construction industry, engineering data, ordnance and global positioning.

## **Practicing Occupational Health and Safety(Requirement and the Environmental Impact)**

**(CSOH1100)**

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.

## **Preparing Sites and Carry Out Steel –Fixing**

**(CSSS1101)**

This course is designed to give students general knowledge about the construction industry, skills to investigate construction sites, and setting out of a building. It includes in-depth practical and theoretical knowledge of site preparation, soil testing, types of foundations, construction and installation of matting, wall bars and stiffeners as well as excavation of foundation trenches.

## **Preparing Geometric Drawing and Sketches**

**(CSGS1102)**

This course is designed to enable students to develop the requisite knowledge, skills and attitudes to communicate effectively in the construction 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 drawings. 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 construction team, and to a lesser extent by the end users of related products and services.

## **Practicing National Building Codes & Regulations**

**(CSBR2119)**

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.

## **Using Drawing Technologies 1 (AutoCAD)**

**(CSDT1209)**

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 basic 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.

## **Internship/Externship (Work Experience)**

**(BWIE1100)**

This Externship/Workplace Attachment Programme is designed to provide the students with industrial /business placement commensurate with their chosen careers. 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.

## **Applying the Principles of Physics and Chemistry to Construction (CSPC1213)**

This course is designed to introduce learners to the principles of physics and chemistry and their individual as well as combined application to construction. Learners will be exposed to the fundamentals and importance of chemical processes from which basic raw materials such as cement, mortar, steel, glass, paints, varnishes that are used in the construction of structures etc., are manufactured. They will also learn about the application of physics in determining how a building interacts with its environment in terms of energy, heat, sound, air movement and moisture. The learners will also cover contents relating to Newton's laws, static, dynamics, atomic structures, and properties of building materials applicable to the construction industry

## **Apply Building Finishes (CSBF2120)**

This course is designed to expose learners to the fundamental knowledge of different types of building finishes and their application to structures. The learners will grow to appreciate that finishes are used in the final part of the construction process and can protect the element they finish from varying impacts etc. The learners will also be exposed to the knowledge of how to use finishes to add aesthetical value to the structure and the decorative prospects of finishes.

## 18. Programme Requirements

Institutions seeking to offer this programme will have to demonstrate that they satisfy the minimum programme requirements indicated in the table below.

#	PREPARATORY PROGRAMME REQUIREMENTS FOR IMPLEMENTATION
1	<b>Required Facilities</b>
	Equipped Computer lab
	Equipped Skills training lab
	Adequate Classroom(s)
	Adequate Internet Access
	Equipped SEN facilities, with respect to target group
	Consider flexible learning options, where possible
2	<b>Learning/Training Resources Requirements (<i>Please indicate</i>)</b>
	Investigate the availability of curriculum, Learner guide, Facilitator's manual
	Investigate the availability of Library materials
	Investigate the availability of multimedia content
	Investigate the availability of repurposed content for flexible learning
3	<b>Required training Equipment/Tools/Software/Hardware</b>
	Determine the delivery material requirements (e.g. Electrical wires)
	Determine the required computer software/hardware
	Determine the required tools/equipment
	Determine the required online simulation resources, if applicable
4	<b>Human Resources Requirements</b>
	Determine adequacy of skill Instructors
	Determine the Instructor qualification requirements
	Determine the need for Lab Assistants
	Determine the required Assessors
5	<b>Required Assessment Strategies to be Approved with accrediting body</b>
	Determine the requirements for traditional assessment modes
	Determine the requirements for Blended / flexible Assessment modes
6	<b>Required Delivery Modality</b>
	Determine the requirements for flexible learning/ Blended (Developed content)
	Determine the requirements for Face to Face (Developed delivery content)

	Determine the requirements for SEN Modified Delivery Content
<b>#</b>	<b>PREPARATORY PROGRAMME REQUIREMENTS FOR IMPLEMENTATION</b>
<b>7</b>	<b>Required Programme Budget/Costs/Fees</b>
	Calculate Programme delivery costs
	Calculate Student/Trainee fees
	Other costs



## 19. References

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Jamaica Information Service (2018). Jamaica Seeing Construction Boom retrieved from <https://jis.gov.jm/jamaica-seeing-construction-boom/>

Jamaica Information Service (2022). Community Colleges Ready for Sixth Form Pathways Programme retrieved from <https://jis.gov.jm/community-colleges-ready-for-sixth-form-pathways-programme/>

Ministry of Education, Youth and Information (2021). Sixth Form Pathway Programme , retrieved from <https://moey.gov.jm/wp-content/uploads/2021/11/SFPP-Framework-formatted-Nov-5-2021.pdf>

The Gleaner (2022). PM Concerned about Labour Shortage in Construction retrieved from <https://jamaica-gleaner.com/article/news/20220420/pm-concerned-about-labour-shortage-construction>

# COURSE

# COURSE

# OUTLINES

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Erecting Concrete Structures
<b>COURSE CODE:</b>	CSCS1208
<b>CREDITS:</b>	4
<b>CONTACT HOURS:</b>	120 hours (30 hours theory 90 hours practical)
<b>PRE-REQUISITE(S):</b>	Preparing Sites and Carry Out Steel-fixing
<b>CO-REQUISITE(S):</b>	
<b>SEMESTER:</b>	II

## **COURSE DESCRIPTION:**

This course is designed to expose the learner to key principles and techniques employed to erect concrete structures in the 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 decisions regarding ingredient selection and use of concrete. With this knowledge, the learner would erect small structures using concrete and other building materials.

## **COURSE OUTCOMES:**

Upon successful completion of this course, learners will be able to:

1. explain the properties of concrete.
2. differentiate various types of cement.
3. demonstrate various tests to analyse the strength of concrete.
4. examine the importance of aggregates during the preparation of concrete.
5. construct small concrete structures such as block wall, driveways, and law tiles.

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. evaluate the properties of cement.
2. discuss the properties and composition of various types of cement and their use in the concrete industry.
3. justify the use of various types of aggregates during the production of cement.
4. demonstrates the aggregate quantities typically used in concrete.
5. define the term “cementitious materials”.
6. calculate water/cementitious materials ratios.
7. assess the effects of admixtures on the properties of concrete.
8. explain how the dose of lithium admixture is calculated to control alkali-silica reactions.
9. demonstrate the proper sequencing of admixtures.
10. assess the effects of fly ash, blast furnace slag, silica fume, and metakaolin on the properties of concrete.
11. justify the effects of cement fineness on water demand and concrete strength properties.
12. recognize the importance of controlling the heat of hydration in concrete.
13. discuss precautions that should be taken when interfacing with dry and wet concrete.
14. use various techniques for preparing different types of concrete.
15. use the correct water-to-cement ratio to prepare various types of concrete.
16. use the correct aggregate ratio to prepare various types of concrete.

**Content:**

1. Occupational Health and safety standards for interfacing with cement.
2. Properties of cement:
  - a. Fineness of cement
  - b. Soundness
  - c. Consistency
  - d. Strength
  - e. Setting time
  - f. Heat of hydration
  - g. Loss of ignition
  - h. Bulk density
  - i. Specific gravity (Relative density)
3. Types of cement and their uses:
  - a. Ordinary Portland Cement (OPC)
  - b. Portland Pozzolana Cement (PPC)
  - c. Rapid Hardening Cement
  - d. Quick setting cement
  - e. Low Heat Cement
  - f. Sulphates resisting cement
  - g. Blast Furnace Slag Cement
  - h. High Alumina Cement
  - i. White Cement

- j. Coloured cement
  - k. Air Entraining Cement
  - l. Expansive cement
  - m. Hydrographic cement
4. Materials used to make cement.
  5. Types of aggregates and their significance in cement production.
  6. Silt Test.
  7. Supplementary cementitious materials.
  8. Water-to-cement ratio.
  9. Aggregate ratio.
  10. Types of concrete:
    - a. Pre-stress concrete
    - b. Post-Tension Concrete
    - c. Insitu Concrete
    - d. Reinforce concrete
    - e. Mass concrete
  11. Environmental factors increase the probability of plastic shrinkage cracking.
  12. Factors that impact the strength of concrete.
  13. Durable aspects of concrete.
  14. Effects of various types of admixtures on the properties of concrete:
    - a. Water-reducing admixtures
    - b. Retarding admixtures
    - c. Accelerating admixtures
    - d. Superplasticizers
    - e. Corrosion-inhibiting admixtures

## UNIT II – EVALUATING THE STANDARDS AND QUALITY FOR CONCRETE

**(10 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. describe the difference between a code and a specification.
2. assess the requirements for the strength of concrete.
3. explain the process of ordering ready-mixed concrete.
4. assess the requirements for concrete production facilities.
5. summarize the requirements for the delivery of ready-mixed concrete.
6. analyze techniques used in the acceptance testing of ready-mixed concrete.
7. utilize various specimens for standard testing procedures.
8. analyze, and interpret data to make recommendations regarding the selection and use of materials for various applications.

### **Content:**

1. Code and Specification of concrete
2. Requirements to increase the strength of concrete
3. Process for ordering ready-mix concrete

4. Requirements for concrete production facilities
5. Requirements for the delivery of ready-mix concrete
6. Acceptance Testing of ready-mix concrete:
  - a. Sampling from stationary mixers
  - b. Sampling from ready-mix concrete trucks
  - c. Concrete age-strength relationship
  - d. Compressive strength tests
  - e. Slump test

### **UNIT III – PREPARING FOR BRICK/BLOCK LAYING**

**(30 hours)**

#### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. recognize hazards associated with the use of bricklaying and block laying tools, plant and equipment.
2. use various manual handling techniques when brick and block laying.
3. calculate the material requirements from drawings.
4. demonstrate techniques for bricklaying and block-laying tasks.
5. adhere to workplace and equipment safety requirements.
6. construct a straight block wall using appropriate mortar.
7. construct column or pier using concrete blocks.
8. construct corner walling using concrete blocks.
9. construct cross-over walling using concrete blocks.

#### **Content:**

1. Techniques for preparing mixes.
2. Manual handling techniques.
3. Techniques for brick and block laying.
4. Occupational health and safety for block and bricklaying.
5. Types of mortar.
6. Column or Pier.
7. Corner Walling.
8. Cross Over Walling.

### **UNIT IV – USING CONCRETE**

**( 45 hours)**

#### **Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

1. construct a concrete walkway.
2. construct a driveway.
3. create lawn tiles used in the construction industry.
4. demonstrate the sequence for finishing concrete.
5. demonstrate the sequence for curing concrete.

6. carry out special finishes to concrete.
7. carry out tilt slab construction.

**Content:**

1. Finishing Concrete.
2. Curing Concrete.
3. Special Finishes to concrete must include known applications such as acrylics (Trowel on).
4. Tilt slab construction.
5. Construction of walkways.
6. Construction of driveways.
7. Construction of lawn tiles.

**UNIT V - REINFORCING CONCRETE STRUCTURES**

**(20 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. evaluate reasons for using reinforcement in concrete structures.
2. demonstrates proper placement of reinforcement in concrete structures.
3. assess the importance of Pre-stressing and post-tensioning.
4. explain SI (metric) sizes for reinforcement and strength grades of deformed steel bars.
5. compare fiber-reinforced polymer (FRP) bars with steel bars.
6. demonstrates the proper use of FRP bars.
7. demonstrates the proper use of steel fibers in concrete.
8. evaluates the effects of fibers on plastic and drying shrinkage cracking.
9. demonstrates proper care and protection of coated and uncoated bars.

**Content:**

1. Importance of reinforcement in concrete structures.
2. Proper placement of reinforcement.
3. SI (metric) sizes for reinforcement.
4. Strength grades of deformed steel bars.
5. Fiber-reinforced polymer.
6. Plastic and drying shrinkage cracking.
7. Coated and uncoated bars.

**METHODS OF DELIVERY:**

1. Lectures
2. Discussions
3. Demonstration
4. Research
5. Field Trip
6. Case study

## METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment

### On-going Assessment Requirements

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I, II	Written Test –types of cement and its uses, properties of cement, types of concrete, types of admixtures, types of aggregates and its significance	20%
2	III, IV	Practical - construct lawn tile, straight block wall, column, walkway and apply finishes	60%
3	V	Project -placement of reinforced, fiber-reinforced polymer, strength grades of deformed steel bars, Plastic and drying shrinkage cracking	20%
<b>Total</b>			<b>100%</b>

#### **RESOURCE MATERIAL:**

##### **Prescribed:**

Neville, A. M. (2002). *Properties of Concrete*, Pearson Education. England.

##### **Recommended:**

Fine homebuilding (2018). *Foundation Concrete Work*. Taunton Press, Connecticut.

##### **Other online resources:**

Beginner Concrete Side Walk Slab DIY retrieved from <https://youtu.be/IUTkrI8FFuM>



How to build a block wall retrieved from [https://youtu.be/KM\\_C2jvEtiA](https://youtu.be/KM_C2jvEtiA)

How to Build Wall lay the Blocks retrieved from <https://youtu.be/VqOo09NtGdU>

Mudavath, K. (2017). Effect of Water Cement Ratio on Strength of Concrete retrieved from <https://wecivilengineers.wordpress.com/2017/10/06/water-cement-ratio/>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Erecting Wooden Structures
<b>COURSE CODE:</b>	CSWS1210
<b>CREDITS:</b>	4
<b>CONTACT HOURS:</b>	120 hours (30 hours theory 90 hours practical)
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	II

## 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, 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 wooden structures.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain the properties of timber.
2. examine the use of various types of timber in the construction industry.
3. analyse typical structural systems for timber structures.
4. examine the Jamaican Building Codes on erecting timber structures.
5. explain various methods to test the strength of timber.
6. demonstrate various techniques to join timber within the construction industry.
7. demonstrate methods used as reinforcement in timber structures.
8. examine techniques used to preserve the life of timber.
9. construct various timber structures.
10. perform a timber frame fire risk assessment on a construction site.

## UNIT I - EVALUATING THE PROPERTIES OF TIM

(10 hours)

### Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. justify the use of timber in the construction industry based on its mechanical properties.
2. justify the use of various types of timber in the construction industry.
3. value typical structural systems for timber structures.
4. evaluate methods of testing the structural integrity of timber.
5. assess the Jamaican Building Codes on erecting timber structures.

### Content:

1. Mechanical properties:
  - a. Strength
  - b. Stiffness
  - c. Durability
2. Types of Timber:
  - a. Hard
  - b. Soft
  - c. Glue-laminated Timber
  - d. Laminated veneer lumber (LVL)
  - e. Cross-laminated timber
3. Methods to test timber:
  - a. Oven dry testing
  - b. Moisture meter
  - c. Compression Test
4. Jamaica Building Codes:
  - a. Design rules for timber structures
  - b. Verification of timber structures

## UNIT II – PRESERVING TIMBER

(10 hours)

### Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. assess the problems that affect the longevity of timber in the construction industry.
2. apply the appropriate preservative treatments to increase the longevity of timber.

### Content:

1. Types of Problems:
  - a. Woodworm
  - b. Dry Rot
  - c. Wet Rot

2. Preservative Treatments:

- a. Boron salts
- b. Copper, chromium, and arsenic salts (CCA)
- c. Light organic solvent-borne preservative (LOSP)
- d. Alkaline copper quat (ACQ)
- e. Copper azole
- f. Creosote and pigment emulsified creosote (PEC)

3. Application:

- a. Pressure treatment

4. Treatment:

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

**UNIT III – PROTECTING TIMBER FRAMES FROM FIRES**

**(10 hours)**

**Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

1. perform a timber frame fire risk assessment on a construction site.
2. evaluate techniques used to eliminate the fire hazards associated with timber both in and out phase of the project.
3. assess methods to mitigate the fire risk associated with timber frames.
4. justify the relevance of the Jamaica Fire Codes as it relates to erecting timber structures.

**Content:**

1. Fire Risk Assessment.
2. Eliminating Hazards.
  - a. Occupant Capacity of a Building Space:
    - i. Calculation:
      - The number is calculated by dividing the area of room or storey(s) (m<sup>2</sup>) by a floor space factor (m<sup>2</sup> per person).
    - ii. Closeness of adjacent buildings.
    - iii. Ignition of adjacent property through radiated heat.
    - iv. The means of escape from adjacent structures.

3. Risk mitigation exercise at the planning and design stage.
4. Jamaica Fire Codes for Structures.

## **UNIT IV - USING MATERIALS FOR PARTITION FRAMES**

**(30 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. differentiate between Womanized Pitch Pine and Pitch Pine.
2. analyse the different types of materials used as studs.
3. analyse the different types of materials used as a top plate and bottom plate.
4. determine the function of staggered blocking board.
5. construct load-bearing walling.
6. construct non-load-bearing walling.

### **Content:**

1. Types and sizes of lumber
2. Types of fasteners
3. Header
4. Double header
5. Studs
6. Door frames
7. Window frames
8. Irregular shape partition
9. Ironmongery
10. Lap joint
11. Dovetail joint
12. Scarf joint
13. Half lap joint
14. Butt joint

## **UNIT V - APPLYING CLADDING TO WOODEN STRUCTURES**

**(30 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. differentiate between various types of cladding.
2. analyse the various methods for installing cladding.
3. critique the various materials used for installation.
4. install sheetrock according to specifications.
5. install fibre rock according to specifications.
6. tape and plaster different types of cladding according to specifications.
7. prepare different types of cladding for painting according to specifications.

### **Content:**

1. Tape and plaster
2. Drywall compound
3. Sheetrock
4. Fibre rock
5. Concrete board
6. Durock
7. Sandpapers
8. Emerald cloth
9. Types of fasteners
10. Splicing
11. Insulation

## **UNIT VI - CONSTRUCTING TIMBER FLOOR**

**(30 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. differentiate between subfloors and suspended floors.
2. analyse the difference between the structural floor members.
3. construct a timber floor subfloor.
4. construct a suspended timber floor.
5. applying finishes to wooden structures.

### **Content:**

1. Floor joists
2. Herring board truss
3. Headers
4. Sill
5. Trimming Joists
6. Trimmer Joists
7. Girder
8. Ledger
9. Finishing techniques for wooden structures (varnishing, painting, gloss/glaze finishing, etc.)

### **METHODS OF DELIVERY:**

1. Lectures
2. Demonstration
3. Video presentation
4. Discussions

5. Field Trip
6. Research

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**On-going Assessment Requirements**

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I, II, III	Portfolio – Mechanical Properties, Types of timber, Methods to Timber, Preservative Treatment, Risk assessment	40%
2	IV, V, VI	Practical (group)– Construct load-bearing wall, non-bearing wall, cladding wall, suspended floor and apply finishes to wood structure	60%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:**

**Prescribed:**

Wagner, H.W., Smith H. B. et al. (2015). *Modern Carpentry*. Twelfth edition, McGraw Hill Education, NY.

**Recommended:**

Brackett, G. (2019). *Carpentry and Framing - Complete Handbook*. Second Edition. NY.

**Other online resources:**

Fortex Cladding Installation Demo retrieved <https://youtu.be/XcxZrGyXZ1k>

Floor Framing retrieved from <https://youtu.be/d5m7rYG2Lzg>

How to Build an Interior Wall with Door-Load Bearing vs Non-Load Bearing Doorway  
retrieved from <https://youtu.be/UtG7woaKpmQ>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Practicing Occupational Health Safety Requirement
<b>COURSE CODE:</b>	CSOH1100
<b>CREDITS:</b>	3
<b>CONTACT HOURS:</b>	45
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	I

## **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.

## **COURSE OUTCOMES:**

Upon successful completion of this course, learners will be able to:

1. explain local and international Occupational Safety and Health regulations (OSH).
2. demonstrate safety procedures to prevent injury to self, clients and colleagues at the workplace.
3. use mechanical and electrical operations safely.
4. use tools and equipment safely.
5. conduct occupational health and safety drills.
6. use various types of fire extinguishers.
7. apply basic first aid and CPR.
8. Identify hazards and hazardous situations.
9. assess workplace and occupational risks.



## **UNIT I - ADHERING TO OHS REQUIREMENTS**

**(9 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. explain the importance of health and safety at the workplace.
2. outline the history of health and safety at the workplace.
3. research OHS requirements, laws and regulations as applicable to the construction industry.
4. identify causes of accidents workers are exposed to at the workplace.
5. identify types of hazards workers are exposed to at the workplace.
6. outline procedures to prevent injury.
7. write an accident report.
8. demonstrate safety procedures that can prevent injury to self and colleagues.
9. demonstrate safe work practices when using tools, equipment and materials/substances at work.

### **Content:**

1. Health and safety – its importance for the work environment.
2. Brief history of OHS in the workplace.
3. Local and international law/regulations on OHS – Factories Regulation, ILO, WHO etc.
4. Causes of accidents and workplace hazards: chemical, biological, accidents etc.
5. General accident prevention measures within the construction industry.
6. Making an accident report.
7. Safety procedures to prevent injury to self and colleagues.
8. Safe working practices when using tools, equipment and consumable materials while working.
9. Features of safe work and healthy work environment.

## **UNIT II - FOLLOWING ELECTRICAL AND MECHANICAL EQUIPMENT SAFETY REQUIREMENTS**

**(6 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. identify electrical equipment and electrical hazards.
2. identify mechanical equipment hazards.
3. use safety procedures with electrical equipment and electricity.
4. apply safe electrical practices and operation at work.
5. interpret electrical hazard safety signs correctly.

6. demonstrate safe electrical installation of equipment, fixtures and appliances.
7. use First Aid to treat electrical shocks.

**Content:**

1. Electrical equipment and electrical hazards.
2. Safety precautions when using electrical equipment and electricity.
3. Safe electrical practices and operations.
4. Electrical safety hazard signs.
5. Recognizing safe electrical installations of equipment, fixtures and appliances.
6. Treating electrical shocks – how to isolate an injured person and apply First Aid.

**UNIT III – HANDLING HAZARDOUS MATERIALS / SUBSTANCES (6 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. identify various hazardous materials /substances related to the job.
2. recognize various hazard signs and symbols used in the workplace.
3. describe the procedures for the proper handling and disposal of hazardous materials /substances.
4. investigate the impacts of hazardous materials and substance on the human and natural environment.

**Content:**

1. Types of hazardous materials/substances at the workplace: toxic materials, flammable, corrosive, explosive, fumes gases, radioactive etc.
2. Hazard symbols and signage.
3. Correct safety precautions and procedures when using hazardous materials – flammable gases, acids etc.
4. Safe storage and handling of hazardous materials/substances.
5. Procedures for disposal of hazardous materials.
6. Environmental and human effects of hazardous materials and substances.

**UNIT IV - PRACTICING FIRE SAFETY AND HAZARDS MITIGATION (12 hours)**

**Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

1. identify types of fire hazards common to the work environment.
2. demonstrate the correct type of fire extinguisher for the various situation.
3. describe the proper location of fire extinguishing equipment at the workplace.

4. demonstrate the correct procedures when extinguishing different types of fires at the workplace.
5. conduct a fire drill in a lab-setting.
6. write a report fire drill report.
7. describe the safety procedures and precautions used to handle and store flammable materials.
8. explain the importance of an assembly point at the workplace.

**Content:**

1. Fire hazards at work.
2. Fire hazards symbols.
3. Demonstration of the use of fire extinguishers.
4. Selection of various types of fire extinguishers.
5. Conduct fire drills.
6. Fire Drill Report: time; number of participants; fire drill plan, safety protocol etc.
7. Proper fire extinguisher's location at the workplace.
8. Assembly points.

**UNIT V - ADMINISTERING FIRST AID AND CPR**

**(12 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. explain the importance of First Aid and CPR within the workplace.
2. outline the steps taken when an accident occurs.
3. apply the ABC Assessment for first aid.
4. identify items for First Aid kit and its location.
5. demonstrate how to treat cuts and bruises with first aid (demonstration/simulation).
6. demonstrate the application of first aid and CPR to injured colleagues (Simulation).
7. examine the role of having trained first-aider at the workplace.
8. take steps to acquire professional certification in First Aid and CPR.
9. assess the role of the Government Agencies, Professional Bodies in OHS compliance.

**Content:**

1. First aid and its importance.
2. Steps to be taken when an accident occurs.
3. First aid – Airway, Breathing, and Circulatory assessments.
4. Treating cuts and bruises (simulation/demonstration).
5. First Aid Kit – its location and use.
6. Administering first aid and CPR to the injured.

7. Emergency services in the work community – ambulance, fire, police, accident, natural disaster organizations etc.
8. Role of trained first-aider at the workplace.

**METHODS OF DELIVERY:**

1. Lectures
2. Discussions
3. Research
4. Video Presentation
5. Role play

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**On-going Assessment Requirements**

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
<b>1</b>	<b>I, II, III</b>	Written Test- write accident report, safe working practices, safety procedures to prevent injury, treating electrical shocks, electrical safety hazards precaution when using electrical equipment, types of hazardous materials, procedures for disposal of hazardous materials,	40%
<b>2</b>	<b>IV</b>	Practical- conduct a fire drill, write fire drill report, use extinguisher equipment, procedures for handling and storing hazardous materials	30%
<b>3</b>	<b>V</b>	Practical- treat cut and bruises, conduct first aid and CPR, step taken when accident occurs	30%
<b>Total</b>			<b>100%</b>

## **RESOURCE MATERIAL:**

### **Prescribed:**

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

### **Recommended:**

Benjamin, O. A. (2008). *Fundamental Principles of Occupational Health and Safety*, (2<sup>nd</sup> ed) International Labour Organization.

Goold, G. (1997). *First Aid in the Workplace*. Prentice Hall NJ, USA.

Koradecka, D. (2010). *Handbook of Occupational Safety and health*. CRC Publishers.

### **Other online resources:**

AOTOC (2021). Methods of Hazardous Waste Disposal for Businesses retrieved from

<https://a-otc.com/hazardous-waste-disposal-methods/>

Basic First Aid Training UK retrieved from <https://youtu.be/ErxKDbH-iiI>

CPR Training Retrieved from <https://youtu.be/CuUXdQI5LLs>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Preparing Sites And Carry Out Steel-Fixing
<b>COURSE CODE:</b>	CSSS1101
<b>CREDITS:</b>	3
<b>CONTACT HOURS:</b>	75 (30 hours theory, 45 hours practical)
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	I

## COURSE DESCRIPTION:

This course is designed to give students general knowledge about the construction industry, skills to investigate construction sites, and setting out of a building. It includes in-depth practical and theoretical knowledge of site preparation, soil testing, types of foundations, construction and installation of matting, wall bars and stiffeners as well as excavation of foundation trenches.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. describe function of various professionals and trade persons in the construction industry.
2. analyze soil types to determine the type of foundation suitable.
3. demonstrate competencies in setting out a building, and excavation of foundation.
4. differentiate among timbering to foundation trenches.
5. demonstrate competencies in the construction and installation of steelwork.

## UNIT I – INTRODUCING THE CONSTRUCTION INDUSTRY (6 HOURS)

### Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify the various professionals and tradesmen on a building team.
2. describe the function of the various professionals and trade persons in the construction industry.

3. describe the overall construction projection process from conceptualization to implementation.

**Content:**

1. Building Team.
2. Function & Roles of Various Professional.
3. Construction Process from Conceptualization to Implementation.

**UNIT II – PREPARING THE CONSTRUCTION SITE**

**(23 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. analyze factors affecting choice of site (accessibility, cost, topography etc.).
2. differentiate types of hoarding.
3. differentiate between stripping and site clearance of a site.
4. examine various types of soils.
5. evaluate types of soil tests.
6. assess the processes involved in “setting out” of a building.
7. conduct setting out of simple and irregular building on a construction site.
8. examine various types of temporary structures.

**Content:**

1. Factors Affecting Site Choice.
2. Types of Hoarding.
3. Stripping & Site Clearance.
4. Types of Soils.
5. Types of Soil Tests.
6. Profile Board.
7. Site Setting Out.
8. Temporary Shelters.

**UNIT III – CREATING FOUNDATION FOR STRUCTURES**

**(23 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. explain the importance of a foundation.
2. evaluate the types of foundations and their uses.
3. assess factors affecting foundations.

4. differentiate various methods for timbering to foundation trenches.
5. Construct types of timbering to foundation trenches.

**Content:**

1. Importance of a Foundation.
2. Types of Foundation and it uses:
  - a. Strip foundation
  - b. Wide strip foundation
  - c. Deep foundation
  - d. Raft foundation
  - e. Step foundation
  - f. Pad foundation
  - g. Short Bored Pile Foundation
  - h. Drilled Shafts foundation
3. Factors Affecting Foundations.
4. Excavation & Timbering to Foundation Trenches:
  - a. Stability of excavations
  - b. Protecting excavations from workers
  - c. Dewatering excavations
  - d. Equipment and Machines necessary for excavating
  - e. Types of timbering

**UNIT IV – INSTALLING MATTING, WALLS AND STIFFINERS (23 hours)**

**Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

1. construct matting for foundation footing.
2. construct foundation wall.
3. construct vertical wall bars.
4. construct stiffeners.

**Content:**

1. Fabrication of Matting:
  - a. Horizontal bar
  - b. link
2. Foundation wall.
3. Vertical wall bars.
4. Stiffeners:
  - a. L- stiffeners
  - b. I - stiffeners



- c. T- stiffeners

**METHODS OF DELIVERY:**

1. Lectures
2. Demonstrations
3. Video Presentations
4. Case Studies
5. Simulation

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**On-going Assessment Requirements**

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I	Written Test- Function and role of professional.	10%
2	II, III	Written Test- choice of site, hoarding. Stripping & Site Clearance, Types of soils, Types of Foundation, Excavation & Timbering.	30%
3	III	Practical Test (Group)- setting out, Types of Timbering to foundation trenches.	30%
4	IV	Practical Test (Group)- matting, vertical bars, stiffeners.	30%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:**

**Prescribed:**

Chudley, R. (2005). *Construction Technology*. fourth edition. Pearson Education Limited. England.

**Recommended:**

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.*

**Other online resources:**

How to layout a Building: The Start of a build Series retrieved from

<https://youtu.be/pdjrOK5R36M>

Timbering to Trenches retrieved from [https://youtu.be/vQaUr\\_O2Iko](https://youtu.be/vQaUr_O2Iko)

Types of Foundation retrieved from

<https://youtu.be/AFLuAKGhanw?list=RDCMUCgMi3Sfl9GNEdfmIRgww1OA>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Preparing Geometric Drawings And Sketches
<b>COURSE CODE:</b>	CSGS1102
<b>CREDITS:</b>	3
<b>CONTACT HOURS:</b>	75 hours (30 theory, 45 practical)
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	I

## **COURSE DESCRIPTION:**

This course is designed to enable students to develop the requisite knowledge, skills and attitudes to communicate effectively in the construction 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 drawings. 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 construction team, and to a lesser extent by the end users of related products and services.

## **COURSE OUTCOMES:**

Upon successful completion of this course, learners will be able to:

1. apply drafting techniques.
2. interpret simple drawings.
3. produce development of different objects.
4. construct auxiliary views.
5. produce ellipse using different methods.
6. construct isometric, oblique, axonometric drawings.
7. produce orthographic view.
8. produce three dimensional sketches using perspective methods.

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. differentiate various types of lines and its usages.
2. classify types of drawings and their purpose.
3. identify drawing forms: units, formats, sheet sizes.
4. apply various types of drawing routines.
5. convert imperial to metric.
6. applying various scales to drawings.

**Content:**

1. Types of lines and usages.
2. Types of drawings.
3. Purpose & classification of drawings.
4. Drawing forms:
  - a. sheet size and format
  - b. metric
  - c. imperial
  - d. copy fold information
5. Drawing routines:
  - a. Signatures
  - b. Approvals
  - c. Dates
  - d. Numbers and Numbering systems
  - e. Design considerations/specifications
  - f. Materials or component specifications
  - g. Lists
  - h. Titles
  - i. Proprietary information
  - j. Representations
  - k. Notes
  - l. Modifications and revision conventions
6. Unit conversions.
7. Scales.

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. draw development view of both pyramid and prism.
2. create model of development layouts.
3. construct ellipses using different methods.
4. draw auxiliary views.

**Content:**

1. Developments:
  - a. Pyramid
  - b. Prism
  
1. Ellipse:
  - a. Rectangular
  - b. Auxiliary
  - c. Foci
  
2. Auxiliary
  - a. Primary auxiliary view construction
  - b. Secondary auxiliary view construction

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. produce drawings in isometric projection.
2. draw oblique drawings.
3. draw axonometric.
4. produce drawings in first angle projection.
5. produce drawings in third angle projection.
6. convert orthographic view into isometric projection.
7. produce sectional drawings.

**Content:**

1. Isometric Projection:
  - a. Regular objects

- b. Irregular objects
- 2. Oblique
- 3. Axonometric
- 3. Orthographic Projection
  - a. First angle
  - b. Third angle
- 4. Sectional Drawing

**UNIT IV - FREE HAND SKETCHES**

**(15 hours)**

**Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

- 1. produce drawings using single point perspective.
- 2. produce drawings using two-point perspective.

**Content:**

- 1. Perspective Drawing
  - a. Single point
  - b. Two-point

**METHODS OF DELIVERY:**

- 1. Lectures
- 2. Demonstration
- 3. Modelling

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**On-going Assessment Requirements**

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I	Written Test- Types of lines & drawings, Drawing forms, Unit conversion and Scales	10%
2	II	Assignment – Development, Ellipse, Auxiliary	30%
3	III & IV	Project- Isometric, Orthographic projection, Sectional, Perspective	60%
<b>Total</b>			<b>100%</b>

## **RESOURCE MATERIAL:**

### **Prescribed:**

Bankole, A. & Bland, S. (1991). *Technical drawing 1: Plane and solid geometry*. England:

Pearson Education Limited.

Green, J.N. (1999). *Technical drawing for G.C.E. & C.S.E.* London: Collins Educational.

Muller, J.E. & Fauseet's, J. (2005). *Architectural drawing and light construction*. 7<sup>th</sup> edition.

New Jersey: Prentice Hall.

**Recommended:**

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.

Goetsch, D. L., Nelson, J. & Chalk, W. S. [2000]. *Technical Drawing*. McMillan Press.

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.

**Other online resources:**

One Point Perspective retrieved from <https://youtu.be/bjhkxFDvD78>

One and two Point Perspective retrieved <https://youtu.be/gY-2iUdm9Cc>

Two-Point Perspective retrieved from <https://youtu.be/ESpRTYIEYdk>

Introduction to Orthographic Projection retrieved from <https://youtu.be/Rz4WWtDX2Kc>



# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Using Drawing Technologies 1 (AUTOCAD)
<b>COURSE CODE:</b>	CSDT1209
<b>CREDITS:</b>	4
<b>CONTACT HOURS:</b>	120 hours (30 hours theory, 90 hours practical)
<b>PRE-REQUISITE(S):</b>	Prepare Geometric Drawings & Sketches
<b>CO-REQUISITE(S):</b>	
<b>SEMESTER:</b>	II

## **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 basic 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.

## **COURSE OUTCOMES:**

Upon successful completion of this course, learners will be able to:

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

## **UNIT I - RECOGNIZING ERGONMICS & COMPUTER BASICS (5 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. describe ergonomic problems relating to computer work stations.

2. state precautions (electrical and mechanical) that should be observed when using computer equipment for CAD.
3. perform safety and ergonomics requirements for performing computer aided drawings.
4. identify the parts of the AutoCAD interface.
5. demonstrate the ability to setup drawing environment.
6. demonstrate the ability to manipulate and manage computer files [Start a new drawing, open an existing drawing, save a drawing, restore a backup CAD file].
7. explain the different types of coordinate methods.
8. use coordinate systems with basic commands.

**Content:**

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

**UNIT II - PERFORMING BASIC DRAWING & EDITING COMMANDS (20 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. produce simple line drawings.
2. draw shapes and geometries.
3. manipulate, edit and change drawings.
4. select objects for editing.
5. view drawings produced.

**Content:**

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

### UNIT III – EXECUTING ADVANCE DRAWING & EDITING IN AutoCAD (30 hours)

#### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. explain the concept of layering.
2. produce construction drawings efficiently and precisely.
3. create window and door openings.
4. insert symbols from Design Center and Tool Palette.
5. create and insert BLOCKS and WBLOCKS Windows.
6. explain the purpose of Text style.
7. create and use Text styles.
8. explain the use of dimension styles.
9. modify text & dimensions.
10. edit text.
11. edit dimensions.
12. edit dimension style.
13. use imperial versa metric dimensions.

#### **Content:**

1. Concept of layering:
  - a. Conceptualize the Create simple layer structures within AutoCAD
  - b. Create layers
  - c. Assign layer properties, colour palette, line types and line weight
  - d. Change layers' state
  - e. Select objects by layers (Quick Select)
2. Create walls for floor plan.
3. Create window and door openings.
4. Insert symbols from Design Center and Tool Palette.
5. Fixtures for:
  - i. Doors
  - ii. Kitchen
  - iii. Bathroom
6. BLOCKS and WBLOCKS Windows.
7. Textstyles:
  - a. Text style and format
  - b. Justification
  - c. Insert Textstyles in floor plan – Single and Multiline text
8. Dimension Styles:
  - a. Insert dimensions using dimension styles in floor plan
  - b. Create and insert dimension styles to plot scale
  - c. Dimension style and format
  - d. Add dimensions to drawings
  - e. Apply linear dimensions

9. Apply continuous, baseline, aligned dimensions, radius, diameter, text leader.
10. Modify text & dimensions.
11. Edit text.
12. Dimensions.
13. Edit dimension style.
14. Imperial versa metric dimensions.

## **UNIT IV - PERFORMING ADVANCE EDITING TECHNIQUES IN AUTO CAD (30 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. edit dimension style.
2. use imperial versa metric dimensions.
3. load linetype.
4. scale linetype.
5. insert and scale hatch patterns.
6. insert Stiffener wblock.
7. add text and dimension to foundation plan.
8. apply offset command sub options.
9. apply Line weight.
10. scale and insert Hatch.
11. insert Donut.
12. add text and dimension to detail at Plot scale.
13. create and insert Multi-Leader Styles.

### **Content:**

1. Linetype
2. Stiffener wblock
3. Lineweight
4. Hatch and Scale hatch patterns
5. Donut
6. Plot scale
7. Offset command sub options

## **UNIT V - PERFORMING ADVANCE DRAWING & EDITING COMMAND (35 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. copy walls from foundation plan using layer state.
2. change linetype for walls from continuous to hidden.

3. insert and array rafters.
4. trim and mirror rafters.
5. create roof covering using hatch options.
6. create elevations from floor plan.
7. insert windows and door as WBLOCKS.
8. create roof on building.
9. insert landscaping symbol.
10. create Tablestyle at plot scale.
11. use advance drawing & editing Commands.
12. draw Site plans.
13. apply surveyor's unit angle.
14. create site boundary.
15. apply linetype scale.
16. copy and insert building in-place.
17. add landscaping symbols.
18. create and insert text and dimstyle.

### **Content:**

1. Foundation plan using layer state.
2. Linetype for walls from continuous to hidden.
3. Rafters:
  - a. insert
  - b. array
  - c. trim
  - d. mirror
4. Roof covering using hatch options.
5. Elevations from floor plan.
6. WBLOCKS:
  - a. Windows
  - b. Doors
7. Roof on building.
8. Landscaping symbol.
9. Tablestyle at plot scale.
10. Advance Drawing & Editing Commands.
11. Site Plans.
12. Surveyor's unit angle.
13. Site Boundary.
14. Linetype scale.
15. Building in-place.
16. Text and dimstyle.

**METHODS OF DELIVERY:**

1. Lectures
2. Demonstration
3. Video presentation

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment****On-going Assessment Requirements**

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I	Written Test – Ergonomic, AutoCAD interface, Coordinate Methods	10%
2	II	Project – Produce various objects using AutoCAD principle and concepts	30%
3	III, IV, V	Project- Full set of construction drawings using Auto principle and concepts	60%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:****Prescribed:**

Ascent (2010). *AutoCAD 2010 Fundamentals – Part 1 & 2, Student Guide (rev. 1.0)*  
Autodesk.

Byrnes, D. (2010). *AutoCAD 2010 for dummies*. New Jersey: Wiley Publishing, Inc.

Finkelstein, E. (2012). *AutoCAD 2012 and AutoCAD LT 2012 Bible*. England: John Wiley & Son.

**Recommended:**

Omura, G. (2010). *Mastering AutoCAD and AutoCAD LT*. Indiana: Wiley Publishing.

Shih, R. H. (2011). *AutoCAD LT 2011 Tutorial*. Mission KS: Schroff Development Corporation.

Shrock, C. R. (2010). *Beginning AutoCAD 2010 Exercise Workbook*. New York: Industrial Press.

Tickoo, S. (2011). *AutoCAD 2011: A Problem-Solving Approach*. New York: Industrial Press.

**Other online resources:**

Starting a new drawing and the drawing interface retrieved from

<https://youtu.be/MWuPbWYJIsA>

Creating One Bedroom Flat Floor Plan PT 1 retrieved from

<https://youtu.be/jEIWb-h7Ujg>

Best Commands & Tricks of AutoCAD for Productivity retrieved

<https://youtu.be/B5dDZ4XRLG8>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Performing Construction Project Planning Techniques
<b>COURSE CODE:</b>	CSCT2224
<b>CREDITS:</b>	3
<b>CONTACT HOURS:</b>	75 hours (30 hours theory, 45 hours practical)
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	IV

## 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.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. develop project charter and scope project activities.
2. schedule and timeline project activities.
3. implement and monitor projects.
4. use project management software and tools.
5. perform critical path analysis for construction projects.



7. implement measures to avoid cost overruns for construction projects.
8. implement contingency plan for a construction project.
9. Evaluate project management team.

## **UNIT I - PREPARE PRE-PROJECT SETUP/INITIATION**

**(15 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. define 'project management'.
2. identify the characteristics of a project.
3. interpret the requirements to complete a pre-project setup/initiation.
4. apply the steps in validating a project.
5. examine the contents of a project charter.
6. develop a project charter.
7. summarize the project life cycle.
8. conduct feasibility arrays.
9. align project to strategic plan.

### **Content:**

1. Definition of Project Management
  - a. The planning, organizing, and managing of tasks and resources to accomplish a defined objective, usually with constraints on time and cost.
2. The Definition and Characteristics of a Project:
  - a. Temporary endeavor
  - b. Delivers a unique product or service
    - i. Bound by time
    - ii. Resources and quality
3. Completing a Pre-Project Setup/Initiation:
  - a. Identify the project
  - b. Validate the project
  - c. Prepare a project charter
  - d. Obtain approval for a project charter

#### 4. Validating a Project:

- a. Validate business case: Feasibility analysis, Justification for project, Alignment to strategic plan
- b. Identify and analyse stakeholders

#### 5. Project Charter:

- a. Key project deliverables
- b. High level milestones
- c. High level cost estimates
- d. Identify stakeholders
- e. General project approach
- f. Problem statement
- g. High level assumptions
- h. High level constraints
- i. High level risks
- j. Project objectives

#### 6. Project Life Cycle:

- a. Initiating/Pre-project setup
- b. Planning
- c. Executing
- d. Monitoring/controlling
- e. Closing project

## UNIT II – APPLYING CONSTRUCTION MANAGEMENT TECHNIQUES (20 hours)

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. prepare a project scope document based on an approved project charter.
2. use a Work Breakdown Structure (WBS) and WBS dictionary to organize project planning.
3. outline a process for managing changes to the project.
4. develop a project schedule based on WBS, project scope and resource requirements.
5. create a project schedule using Project Management Software.
6. evaluate a desired deliverable, apply the appropriate tool and/or method to produce the appropriate outcome.
7. interpret the results of using project management tools and/or methods in a given scenario.

## **Content:**

1. Project Scope.
2. Work Breakdown Structure (WBS) and Work Breakdown Structure Dictionary:
  - a. WBS terminologies
  - b. Create WBS structure
  - c. Create a precedence diagram
  - d. Critical path
  - e. Determine float time for activities
3. Project Management Software (Lab component):
  - a. Inserting new and recurring tasks
  - b. Deleting, moving tasks
  - c. Sub-tasks (Indent and Outdent)
  - d. Viewing the Gantt chart & PERT chart (identifying the critical path, milestones)
  - e. Reports – task usage, costs, over allocated staff, completed tasks
  - f. Resource levelling
  - g. Updating tasks
  - h. Change non-working time (e.g. public holidays)
4. Internal / External Communication:
  - a. Frequency
  - b. Format (formal, informal, written and verbal)
  - c. Method of distribution
  - d. Distribution list
  - e. Assign costs

## **UNIT III – LEAD PROJECT MANAGEMENT TEAM**

**(15 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. evaluate different leadership styles.
2. demonstrate the characteristics of effective project leader.
3. differentiate between leadership and motivation.
4. coordinate human resources to maximize project performance.
5. explain the importance of a project kick-off meeting.
6. conduct the project kick-off meeting.
7. explain the purpose and influence of organizational governance on a project's execution.

8. explain the different types of project organizational structures.

### **Content:**

1. Leadership and Motivation:
  - a. Definition of leadership
  - b. Leadership styles: Task oriented, Participative, Autocratic, Reward based, Laissez faire, Situational
  - c. Definition of motivation
  - d. Motivation Theories: Maslow's hierarchy, David C McClelland's motivational needs theory, Frederick Herzberg's Motivation – Hygiene (Two Factor) Theories
  - e. Coordinating Human Resources
  - f. Assemble and develop project team, build team cohesiveness, perform individual performance appraisals
  - g. Identify common causes of conflict: Competing resource demands, Expert judgment, Varying work styles
  - h. Detect conflict and apply conflict resolution techniques: Smoothing, Forcing, Compromise, Confronting, Avoiding, Negotiating
2. Project Kick-off Meeting:
  - a. Communicates stakeholder expectations, high level timeline, project goals and objectives, roles and responsibilities to the project team.
3. Organizational Governance:
  - a. Standards compliance: Local, state, federal, ISO
  - b. Internal process compliance: Audit trails, retention, version control
  - c. Decision oversight: Change Control Board, committee consulting
  - d. Phase gate approval: Tollgate approval, project phase transition
4. Components of Project Plan Affected and Actions.
5. Types of Organizational Structures
  - a. Functional
  - b. Weak matrix
  - c. Matrix
  - d. Strong matrix

## **UNIT IV – MANAGE PROJECTS**

**( 15 hours)**

### **Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

1. explain project management procedures.
2. manage projects according to project plan, scope and time lines.
3. implement change management procedures given a scenario.
4. evaluate the impact of potential changes to triple constraint.

5. Use risk management plan to determine appropriate response to potential risks or opportunity events.
6. Execute appropriate resource levelling techniques.
7. Apply the appropriate steps to ensure quality of project deliverables.
8. Identify tools to use when a project deliverable is out of specifications.
9. Manage and implement information distribution based on communication plans.

**Content:**

1. Project Management Procedures
  - a. Identify change
  - b. Document using the appropriate change control forms
  - c. Perform impact analysis
  - d. Coordinate with the appropriate stakeholders to select the course of action
  - e. Update the appropriate project plan components based on the approved change request
2. Triple Constraint
  - a. Time / Schedule
  - b. Cost / resources
  - c. Quality
  - d. Scope
3. Risk Management Plan
  - a. Perform qualitative and quantitative risk analysis
  - b. Opportunities: Sharing, Exploiting, Enhancing
  - c. Threats: Avoidance, Acceptance, Mitigation
  - d. Update risk register with appropriate changes
4. Resource Levelling Techniques
  - a. Fast tracking
  - b. Crashing
  - c. Delaying
  - d. Optimizing: Use of tools as necessary
5. Ensuring Quality of Project Deliverables
  - a. Monitor work performance
  - b. Analyze performance information
  - c. Identify variances
  - d. Generate change requests
  - e. Implement change requests
  - f. Tools to use when a project deliverable is out of specification
6. Project Management Procedures:
  - a. Identify change

- b. Document using the appropriate change control forms
  - c. Perform impact analysis
  - d. Coordinate with the appropriate stakeholders to select the course of action
  - e. Update the appropriate project plan components based on the approved change request
7. Triple Constraint
- a. Time / Schedule
  - b. Cost / resources
  - c. Quality
  - d. Scope
8. Risk Management Plan:
- a. Perform qualitative and quantitative risk analysis
  - b. Opportunities: Sharing, Exploiting, Enhancing
  - c. Threats: Avoidance, Acceptance, Mitigation
  - d. Update risk register with appropriate changes
9. Resource Levelling Techniques
- a. Fast tracking
  - b. Crashing
  - c. Delaying
  - d. Optimizing: Use of tools as necessary
10. Ensuring Quality of Project Deliverables
- a. Monitor work performance
  - b. Analyze performance information
  - c. Identify variances
  - d. Generate change requests
  - e. Implement change requests
11. Tools to use when a project deliverable is out of specification
- a. Pareto charts
  - b. Histograms
  - c. Run charts
  - d. Ishikawa diagram
12. Information Distribution based on Communications plan
- a. Manage stakeholders' expectations
  - b. Schedule effective project meetings
  - c. Periodic stakeholders' updates
13. Special Communication Needs:
- a. Time zones
  - b. Language barriers

- c. Technology barriers
- d. Cultural differences
- e. Communication preferences

## **UNIT V - CLOSE OUT PROJECT**

**( 10 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. differentiate the types of closure of Projects.
2. explain the importance of and benefits of formal project closure.
3. determine circumstances in which project closure may occur.
4. implement the various closing tasks.
5. identify the components and purpose of closing documentation.
6. prepare closing documents.
7. examine close out projects procedures.

### **Content:**

1. Types of closure:
  - a. Definition of closure/termination
  - b. Termination by extinction
  - c. Termination by addition
  - d. Termination by integration
  - e. Termination by starvation
2. Formal Project Closure
  - a. Importance and benefits
3. Phase Closure:
  - a. Phase closure
  - b. Project completion
  - c. Stage completion
  - d. Component completion
4. Closing Tasks:
  - a. Ensure that tasks have been completed
  - b. Confirm and document objectives that were completed/not completed
  - c. Meet with stakeholders to get their final approval
  - d. Finalize contractual commitments - to vendors, suppliers etc.
  - e. Transfer responsibilities (e.g. maintenance tasks)
  - f. Reassign people
  - g. Conduct performance appraisals

- h. Release and reassign resources
  - i. Ascertain any product support requirements
  - j. Complete final accounting
  - k. Provide historical information for future use
  - l. Standards compliance: Document retention compliance
  - m. Document the results
  - n. Have a formal meeting to acknowledge completion.
  - o. Review the results – what went right/wrong
5. Closing Documentations:
- a. Lessons learned: Strengths / weaknesses
  - b. Close report: Historical data, Summary of costs
  - c. Postmortem analysis: Documents reasons for early closure and impact
  - d. Final individual performance appraisals

## **METHODS OF DELIVERY:**

- 1. Practical Demonstration
- 2. Lectures
- 3. Group discussion
- 4. Field Trips
- 5. Field Activities



**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**On-going Assessment Requirements**

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I, III,IV	Portfolio-Prepare Pre-project setup, Lead Project Management Team, Manage Projects	35%
2	II	Project- Using Microsoft Project for WBS, critical path, resource levelling, report, Assign cost, milestones	35%
3	V	Test- Closing Out Project	30%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:**

**Prescribed:**

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

**Recommended:**

Brackett, G. (2019). *Carpentry and Framing - Complete Handbook*. Second Edition. NY.

**Other online resources:**

Developing the Project Charter Practical Project Management Training retrieved from

<https://youtu.be/jPLAuCUHkSY>

Microsoft Project Tutorial for Beginner retrieved from <https://youtu.be/o7IIvcLURsS>

Project Scheduling PERT/CPM Finding Critical Path retrieved from <https://youtu.be/-TDh-5n90vk>

What is Resource Levelling Project Management in Under 5 retrieved from

<https://youtu.be/IvN6kyMUe3Q>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Performing Site Surveying
<b>COURSE CODE:</b>	CSSP2115
<b>CREDITS:</b>	4
<b>CONTACT HOURS:</b>	120 hours (30 hours theory, 90 hours practical)
<b>PRE-REQUISITE(S):</b>	Performing Mathematics for Construction Site Management II
<b>CO-REQUISITE(S):</b>	
<b>SEMESTER:</b>	III

## 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 levelling, as it relates to the construction industry, engineering data, ordnance and global positioning.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. demonstrate the correct use of various tools used for capturing measurements for survey documents according to international standards.
2. conduct chain surveying and levelling instrument.
3. apply theory and practical concept to produce graphical representation.
4. examine the relationship between measured values and calculated values and the degrees of accuracy for given practical assessments.

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

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

**Content:**

1. Definition the term “surveying”.
2. Types of surveys:
  - a. Plane
  - b. Geodetic
  - c. Preliminary
3. Classes of surveys that are performed on a construction site:
  - a. Control
  - b. Preliminary
4. Survey tools:
  - a. Historic
  - b. Modern

5. Methods of Surveying:
  - a. Historic
  - b. Modern
6. Principles of Surveying.
7. Survey Referencing:
  - a. Grid Reference
  - b. Legal Reference
  - c. Vertical Reference
  - d. Geographic Reference
  - e. Accuracy and precision
  - f. Location methods
  - g. Unit of measure
  - h. Accuracy ratio
  - i. Distance measurement
8. Survey Tools
9. Branches of Surveying
10. Field notes and data and list rules for establishing such data
11. Planning of survey exercises
12. Establish boundaries, corners, and tie marks
13. Reconnaissance Survey
14. Geomatic instruments
15. Angular Measurement

## UNIT II – CONDUCTING DISTANCE MEASURING AND CHAIN SURVEY (20 hours)

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. outline equipment used in chain surveying and distance measuring.
2. assess the characteristics and use of tapes and chains.
3. inspect ways that tapes are marked or gradated.
4. use tapes chain surveying equipment according to international standards.
5. conduct a chain survey during field work according to international standards.
6. set out or set up measuring instruments over stations (plumbed with optical squares or plumb bob).
7. locate stations or targets accurately during a field exercise.
8. set and reset geomatic instrument positions to read horizontal face right and left.
9. apply appropriate tools to measure distances accurately.
10. observe surveying error after a field exercise.
11. practice to “book information” for chain surveying field work.

## **Content:**

1. Chain Surveying Equipment.
2. Distance Measuring Equipment
3. Tapes and Chains
  - a. Characteristics
  - b. Ways in which tapes are marked or graduated
4. Set-up or Set-out Equipment
5. Stations and Targets
6. Surveying Errors
7. Geomatic Instruments
8. Reports:
  - a. Bounded and unbounded books
  - b. Instruments database

## **UNIT III – CONDUCTING A LEVELING SURVEY**

**(30 hours)**

## **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. define the term “levelling”.
2. outline the characteristics and uses of a level, theodolite and total station.
3. illustrate the components of a level and a tripod.
4. operate a level, staff and a tripod according to international standards.
5. conduct a levelling survey to include reading various types of “staff” markings.
6. demonstrate the procedures to “book information” from levelling field work.
7. create a field book with notes from surveying activities at various locations.
8. calculate the absolute values of a levelling exercise.

## **Content:**

1. Types of Levels.
2. Components of:
  - a. Levels
  - b. Tripod
3. Preparing a Levelling Report
4. Absolute values

## UNIT IV - PERFORMING VOLUME AND AREA COMPUTATION (20 hours)

### Learner Outcomes

Upon successful completion of this unit, learners will be able to:

1. compare the terms “cross-section” and “profile”.
2. sketch the cross-sectional arrangement for a cut and fill section for a road.
3. calculate volume using the prismoidal formula/end areas.
4. calculate areas trapezoidal technique/Simpson’s 1/3 rule.
5. sketch a topographical area for a section to be filled for road construction.

### Content:

1. Cross-section
2. Profile
3. Prismoidal Formula/end areas
4. Trapezoidal Technique
5. Simpson’s 1/3 Rule

## UNIT V - CONDUCTING TRAVERSING (30 hours)

### Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the term “traverse”.
2. assess the types of traverses used in surveying.
3. state the definition of critical components of traversing.
4. sketch diagram to show reverse bearings.
5. establish a right angle using a double right angle prism (optical square).
6. layout corners using a double right angle prism (optical square).
7. establish north using a compass.
8. calculate magnetic declination from various surveys.
9. calculate azimuth data with the use of a sketch.
10. explain the term deflection angles.
11. justify an azimuth computation from the south east quadrant with the use of a diagram (or any other quadrant).
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.
13. perform a bearing computation for a closed traverse/open traverse.

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

**Content:**

1. Definition of terms:
  - a. Traverse
  - b. Bearings
  - c. Azimuth
  - d. Horizontal angle
  - e. Vertical angle
  - f. Deflection Angles
2. Types of traverse:
  - a. Closed
  - b. Open
3. Right angle using a double right angle prism (optical square)
4. Corners using a double right angle prism (optical square)
5. North using a compass
6. Calculate magnetic declination:
  - a. original survey
  - b. previous survey
  - c. year to a future time survey
7. Differences between bearings and azimuth
8. Calculate azimuth data and bearings

**METHODS OF DELIVERY:**

1. Lectures
2. Discussion
3. Group Work
4. Video Presentations
5. Field Activities



**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**On-going Assessment Requirements**

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I,II	Practical – Apply Basic Survey Concept, Measuring ChainSurvey	25%
2	III	Practical – Conducting levelling Survey	25%
3	IV, V	Practical Group – Performing volume & Ares Computation Conducting Traversing	50%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:**

**Prescribed:**

Kavanaugh, B. F. (2008). *Surveying: Principles and Applications* (8th ed.). New Jersey, NJ: Prentice Hall.

Nathanson, A. J., Lanzafama, M. & Kissamt, P. (2005). *Surveying Fundamentals and Practices* (5th ed.). New Jersey, NJ: Prentice Hall.

**Recommended:**

Gibson, R. (2009). The Theory and Practice of Surveying: Containing All the Instructions  
Requisite for the Skilful Practice of This Art. University of Michigan Library.

**Other online resources:**

Principles of Surveying Lecture 1 retrieved from <https://youtu.be/cGbYf8IR35Q>

Surveying 1- Introduction to levelling retrieved from <https://youtu.be/j8poe2vvD2Q>

Traverse Computation Part 1 retrieved from <https://youtu.be/HrniGot75Do>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Erecting Roof Structures
<b>COURSE CODE:</b>	CSRS2116
<b>CREDITS:</b>	4
<b>CONTACT HOURS:</b>	120 (30 hours theory, 90 hours practical)
<b>PRE-REQUISITE(S):</b>	Erecting Wooden Structures
<b>CO-REQUISITE(S):</b>	
<b>SEMESTER:</b>	III

## COURSE DESCRIPTION:

This course is aimed at providing the learner with information that is aligned to erect 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 create roof structures for various buildings.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be 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. explain importance of insulation and ventilation for various roof structures.
4. apply appropriate finishes to roofs according to building code regulations.

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. differentiate types of timber roof structures.
2. point-out the important features of each type of roofs.
3. examine the characteristics of three (3) categories of single roofs.
4. creating models of single, double, trussed roof and trussed rafter roof according to building code regulations.

**Content:**

1. Types of Roof Structures:

- a. Single Roofs
- b. Double Roofs
- c. Trussed Roofs
- d. Trussed Rafter Roofs

2. Features of Roof Structures:

- a. Single Roof
  - i. Common Rafter
  - ii. Ridge
  - iii. Wall Plate
- b. Double Roof
  - i. Common Rafter
  - ii. Ridge
  - iii. Purline
  - iv. Wall Plate
- c. Trussed Roof:
  - i. Hanger
  - ii. Common Rafter
  - iii. Ridge
  - iv. Purline
  - v. Wall Plate
  - vi. Strut
  - vii. Binders
  - viii. Ceiling Joist

3. Trussed Rafter Roof:
  - a. Common Rafter
  - b. Struts
  - c. .Gand Nailed Plates
  - d. Ceiling Joist
  
4. Rafters:
  - a. Common rafters
  - b. Jack rafters
  - c. Valley jack rafters
  - d. Hipped rafter
  - e. Hipped jack rafters
  
5. Characteristics for the Types of Single Roofs:
  - a. Couple Roof
  - b. Collar Roof
  - c. Close Couple Roof

## **UNIT II - APPLYING MATHEMATICAL CALCULATIONS TO ROOF STRUCTURES**

**(45 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. define the following terms “roof span, “roof height or rise” and “roof pitch.
2. calculate the pitch and angle of a roof structure using the rise and span.
3. explain the term “bevel”.
4. calculate the length of the bevel of a common rafter according to building code regulations.
5. construct the verge of a gable roof using the ladder frame, barge board, soffit, fascia.
6. define the term “eave”.
7. outline characteristics of flush, boxed/closed eaves.
8. construct the eave of a gable roof using various approaches according to building code regulations.
9. create various ways of ventilation for roof structures.

## **Content:**

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

## **UNIT III – APPLYING INSULATION AND FINISHES TO ROOF STRUCTURES**

**(30 hours)**

## **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. assess characteristics of warm and cold roof structures.
2. use appropriate materials to construct a warm and cold roof structures.
3. provide at least ten (10) the properties of Ballytherm Polyisocyanurate insulation.
4. apply at least three (3) types of roofing finishes to roof structures.

## **Content:**

1. Construction of warm and cold roofs.
2. Ballytherm Polyisocyanurate insulation.
3. Roofing finishes.

**METHODS OF DELIVERY:**

- 1. Demonstration
- 2. Lectures
- 3. Group discussion
- 4. Field Trips
- 5. Field Activities
- 6. Simulations

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**On-going Assessment Requirements**

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I	Practical Group – Creating Roof Structures	40%
2	II	Practical (Group) – Apply Mathematics Calculation to Roof Structures	30%
3	III	Practical Group – Apply Insulation Finish to Roof Structures	30%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:**

**Prescribed:**

Wagner, H.W. Smith H. B. et al. (2015). Modern Carpentry, Twelfth edition, McGraw Hill Education, NY

**Recommended:**

Porter, B. (1992). Carpentry & Joinery 2 Stoughton limited, London.

**Other online resources:**

Beginner Rafter Layout retrieved from <https://youtu.be/kR6kGufeKIU>

Calculating rafter length retrieved from <https://youtu.be/6SHvvINdZ44>

Insulating between & under rafter retrieved from <https://youtu.be/DFO-asmyrP8>



# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Practicing National Building Codes and Regulations
<b>COURSE CODE:</b>	CSBR2119
<b>CREDITS:</b>	3
<b>CONTACT HOURS:</b>	45 hours (45 hours theory)
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	
<b>SEMESTER:</b>	III

## 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.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

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

## UNIT I – GENERAL PUBLIC HEALTH AND SAFETY REQUIREMENTS (10 hours)

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

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

### **Content:**

1. General; Public Health and Safety Requirements
2. Fire Protection System Escape and exits
3. Material and Construction Standards
4. The Role of the following:
  - a. Building Inspector
  - b. National Environment and Planning Agency
  - c. Commission of Strata Corporations
  - d. Bureau of Standards Jamaica
5. Occupancy Content
6. Location and quantity of staircases and ramps
7. The differences between “building regulations” and “building codes”
8. inspector’s checklist
9. Key features of a building according to the National Building Code:
  - a. Natural light and ventilation
  - b. Minimum areas and dimensions of habitable rooms
  - c. Seating arrangement of public assembly
  - d. Private stairways/common stairways

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. identify the various types of dead and live loads within a building
2. analyse how dead and live loads may impact the structural integrity of a building
3. examine advantages and disadvantages of various foundation types used in construction
4. explain how soil investigation can determine the choice of foundation.
5. examine international tests used to determine the quality and strength of blocks used for masonry construction.
  
6. explain importance of reinforce concrete and structural steel used in the
7. construction industry
8. examine standards for materials used in the construction industry

**Content:**

1. Types of dead and live loads.
2. Impact of live loads and dead loads on structural strength.
3. Foundation types used in construction.
4. Soil investigation and choice of foundation.
5. International Tests on blocks.
  - a. Tensile Strength Test
6. Importance of reinforce concrete and structural steel
7. Standards for Construction Materials
  - a. Blocks
  - b. Cement
  - c. Steel
  - d. Bamboo
  - e. Granite

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. examine the processing of electrical, magnetic, and optical materials used in the construction.

2. explain applications and specifications for HVAC systems.

**Content:**

1. Processing of Electrical, Magnetic and Optical Materials
2. Electrical Installations Requirements
3. Heating Ventilation and Air Conditioning Systems Requirements
4. Heating and Cooking Installations Requirements

**UNIT IV – SOUND INSULATION**

**(10 hours)**

**Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

1. differentiate between sound and noise.
2. identify various ways in which sound is detected and measured.
3. state unit of sound absorption.
4. evaluate which materials are best suited for sound barriers according to international standards.
5. identify ways in which sound can be controlled within various buildings/structures.
6. sketch an annotated diagram depicting how materials and acoustics elements are formulated to capture sound.
7. outline required Decibels and Sabin for noise according to building code regulations.

**Content:**

1. Differences between sound and noise
2. Unit for Sound Absorption – Sabin
3. Materials used as Sound Barriers
4. Ways to control sound
5. Building Code Regulations for Required Decibels and Sabin

**UNIT V – ADHERING TO REAL ESTATE REQUIREMENTS**

**(9 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. define the terms “personal property”, “real property”, “title”, “possession” and “adverse possession”.
2. distinguish between “ownership” and “possession”.
3. examine the characteristics of various types of titles existing within the real estate sector.
4. assess the various rights existing within the real estate sector.
5. define the term “easement”.

6. propose the essential components of an easement.
7. justify the process of creating an easement.
8. apply land law in case scenarios.

**Content:**

1. Definition of terms:
  - a. personal property
  - b. real property
  - c. title
  - d. possession
  - e. adverse possession
2. Differences between “ownership” and “possession”.
3. Characteristics of various types of titles existing within the real estate sector.
4. Rights existing within the real estate sector.
5. Easement:
  - a. essential components of an easement
  - b. process of creating an easement
6. Application of land law in case scenarios.

**METHODS OF DELIVERY:**

1. Lectures
2. Discussions
3. Research
4. Case Studies
5. Gallery walk

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**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%

<b>Total</b>			<b>100%</b>
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**RESOURCE MATERIAL:**

**Prescribed:**

International code Council (2009). International Building Code, IL

**Recommended:**

International code Council (2018). International Building Code, IL

**Other online resources:**

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Determining Bill of Quantity for Substructures
<b>COURSE CODE:</b>	CSBQ2119
<b>CREDITS:</b>	3
<b>CONTACT HOURS:</b>	45 hours (45 hours theory)
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	
<b>SEMESTER:</b>	III

## **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.

## **COURSE OUTCOMES:**

Upon successful completion of this course, learners will be able to:

1. distinguish documents forming the bills of quantity for the various areas of construction work.
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.

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. differentiate between an estimate and guesstimate.
2. explain the basic skills that an estimator most possess.
3. explain basic calculation on the different types of estimating.
4. explain how error can occur during estimating.
5. explain four purposes for the bill of quantity.
6. identify the various documents within a bill of quantity.
7. list the processes involved in preparing a bill of quantity.
8. use measurement procedure in tabulating the dimension sheet.
9. apply rules that govern the dimension sheet.
10. state the general rules when taking off.
11. list the sequence of taking off for a substructure of a building.
12. explain use of the Standard Method of Measurement of Building works.

**Content:**

1. Differentiate between an estimate and guesstimate.
2. Basic skills of an estimator.
3. Ways in which an error can occur during estimating.
4. Examples of costs associated with a construction project.
5. Purposes for the bill of quantity.
6. Processes involved in preparing a bill of quantity.
7. Format a dimension sheet:
  - a. Titling
  - b. Titling of dimension sheet column
  - c. Abbreviations and spacing
  - d. Units application
8. Addressing operations with underline or strike through.
9. General rules when taking off.
10. Sequence of taking off for a substructure of a building.

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. define the terms “mean girth”, ” set back or recess”.
2. compute the excavation to reduce level in substructure.
3. determine the mean girth of rectangular building.
- 4.



5. estimate the mean girth of irregular buildings.
6. evaluate the excavation in foundation trenches.

**Content:**

1. Site Preparation
2. Excavation
3. Mean Girth:
  - a. Regular building
  - b. Irregular building

**UNIT III – CALCULATE EARTH WORK, HARCORE AND CONCRETE (10 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. calculate the quantity of backfill for a construction project.
2. compute the level and compact bottom of foundation trenches.
3. determine hardcore under concrete bed.
4. calculate concrete bed under floor slab.
5. calculate concrete in foundation footing.

**Content:**

1. Backfill
2. Hardcore
3. Concrete
4. Concrete in Foundation Footing

**UNIT IV – CALCULATE EARTHWORK AND REINFORCEMENT IN SUBSTRUCTURE**

**(10 hours)**

**Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

1. calculate adjustment to soil disposal.
2. explain the taking-off process in substructure for steel work.
3. calculate blockwork.
4. calculate steelwork.
5. calculate formwork.

**Content:**

1. Soil Disposal
2. Blockwork
3. Steelwork
4. Formwork

**UNIT V - PREPARE BILL OF QUANTITIES AND BILL SHEETS**

**(9 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. explain the use of prime cost, provisional sum and contingency sum.
2. transfer data to abstract sheet.
3. compute information in standard format on the abstract sheet.
4. complete costing using unit rates.
5. transfer data to bill sheet.

**Content:**

1. Abstract Sheet
2. Bill Sheet

**METHODS OF DELIVERY:**

1. Demonstration
2. Lectures
3. Discussion
4. Video presentation
5. Gallery Walk

## METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment

### On-going Assessment Requirements

No.	Suggested Unit/Unit Cluster	Assessment Strategy	Weight
1	I	Test – Introduction to Quantity Survey	10%
2	II, III, IV	Project 1- All operational activities under substructure	60%
3	V	Project 2- Abstract and Billing Sheet	30%
<b>Total</b>			<b>100%</b>

#### **RESOURCE MATERIAL:**

##### **Prescribed:**

Seeley, I. H (1999). *Building Quantities Explained*. fifth edition, Palgrave, NY.

##### **Recommended:**

Feigenbaum, L., & Dagostino, R. F. (2002). *Estimating in Building Construction* (6th ed). New Jersey, NJ: Prentice Hall.

Pratt, D. (2010). *Fundamentals of Construction Estimating* (3rd ed.). Florence, KY: Delmar Cengage Learning.

##### **Other online resources:**

Detailed introduction to take off substructure works when preparing bill quantities retrieved from <https://youtu.be/D9ynerZVjLY>

How to calculate mean girth retrieved from <https://youtu.be/hQ6OuW5-TR0>

How to measure substructure works for a building with a semi-circle in the plan retrieved from

<https://youtu.be/SW-bN-YA7bA>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Apply Building Finishes
<b>COURSE CODE:</b>	CSBF2120
<b>CREDITS:</b>	4
<b>CONTACT HOURS:</b>	120 (30 theory hours and 90 practical hours)
<b>PRE-REQUISITE(S):</b>	Erecting Wooden Structures
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	III

## COURSE DESCRIPTION:

This course is designed to expose learners to the fundamental knowledge of different types of building finishes and their application to structures. The learners will grow to appreciate that finishes are used in the final part of the construction process and can protect the element they finish from varying impacts etc. The learners will also be exposed to the knowledge of how to use finishes to add aesthetical value to the structure and the decorative prospects of finishes.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. discuss different types of building finishes
2. outline the processes and procedures involved in the application of building finishes
3. demonstrate understanding of the use of materials utilized for building finishes
4. demonstrate an understanding of the tools and equipment used for building finishes
5. apply building finishes to erected structures
6. demonstrate the difference in application of building finishes to timber construction, etc.
7. assess the application of building finishes
8. evaluate building finishes work completed

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

4. discuss the term ‘building’ finish
5. outline the importance of building finishes to different parts of a structure
6. state general safety precautions for the application of building finishes
7. describe the criteria for the selection of building finishes for different structures
8. explain the procedures to undertake before the planning and organization of the application of a building finish
9. differentiate between different types of building finishes
10. state the advantages of building finishes
11. explain the durability of specified building finishes

**Content:**

1. definition of building finishes
2. importance of building finishes to structures
3. safety precautions for the application of building finishes
4. criteria for the selection of building finishes
5. procedures for the planning and organization of building finishes operations
6. overview of types of building finishes
7. advantages of building finishes
8. durability of building finishes

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. discuss the term ‘floor finish’
2. explain the classification of floors
3. outline five (5) basic categories of floor finish ingredients
4. explain the ingredients in a floor finish
5. discuss the purpose of the ingredients in floor finishes
6. calculate the amount of flooring required based on the specified floor area
7. prepare material and other requisition listings based on the project specifications
8. select appropriate PPE to be used throughout the project
9. demonstrate the ability to do surface preparation for effective application of floor finishes
10. illustrate the installation process for a specified floor finish
11. demonstrate the ability to apply a specified floor finish to an erected structure
12. apply specified floor finish to a structure
13. carryout waterproofing inspections and applications as required
14. perform cleanup and safety checks of completed floor finish tasks

**Content:**

The content should include but is not limited to:

7. definition of floor finish
8. classification of floors
  - a. In-situ floor finishes
  - b. Applied floor finishes
  - c. Timber floor finishes
9. basic categories of floor finish ingredients
  - a. Polymer emulsions
  - b. Film formers
  - c. Modifiers
  - d. Preservatives
  - e. Water
10. Types of floors
  - a. Terrazzo
  - b. Stone
  - c. Timber
  - d. Brick
  - e. PCC
  - f. PVC, etc.
11. Waterproofing of floor finishes

12. Calculation of the amount of material required
13. Personal Protective Equipment
14. Materials, requisition, etc. listing
15. Installation of floor finish (timber, tiles, stone, etc.)

### **Unit III – Applying wall finishes to structures**

**(25**

**hours)**

#### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. explain the term ‘wall finish’
2. discuss the purpose of wall finishes
3. differentiate between interior and exterior wall finishes
4. state at least three (3) factors that affect the selection of wall finishes
5. outline two (2) categories of wall finishes
6. explain at least six (6) types of wall finishes
7. discuss the difference between ‘wet’ and ‘dry’ finishes
8. describe at least three (3) types of ‘self-finish’ for walls
9. state the life expectancy for at least three (3) types of ‘self-finish’ for walls
10. outline at least three (3) types of ‘applied finish’ wall finishes
11. state the life expectancy for at least three (3) types of ‘applied finish’ wall finishes
12. calculate the amount of material required based on the specified work area
13. prepare material and other requisition listings based on the project specifications
14. select appropriate PPE to be used throughout the project
15. demonstrate the ability to prepare the wall surface for finishes
16. select appropriate materials and equipment to be used for wall finish applications
17. illustrate the sequence of wall finishing operations for a specified wall finish
18. demonstrate the ability to carry out wall finishes operations using a specified finish
19. apply specified wall finishes to a structure
20. carryout waterproofing inspections and applications as required
21. perform cleanup and safety checks of completed tasks

#### **Content:**

The content should include but is not limited to:

5. Explanation of wall finishes
6. Purpose of wall finishes
7. Interior and exterior wall finishes
8. Selection criteria for wall finishes



9. Categories of wall finishes
  - Self-finish or applied finish
  - Wet finish or dry finish
10. Wet finishes
  - Plaster
  - Paint
  - Wallpaper, etc.
11. Dry finishes
  - Plaster board
  - Timber paneling
  - Carpet, etc.
12. Types of wall finishes
  - Wood panelling
  - Cement plastered finish
  - Laminated finish
  - Tile cladding
  - Marble powder finish
  - Sand textured finish
  - Pebbles finish
  - Flakes finish
  - Canfor or faux finish
  - Coral finish
  - Gypsum plaster finish, etc.
13. Life expectancy of wall finishes
14. Waterproofing of wall finishes
15. Personal Protective Equipment
  - Chemical and leather gloves
  - Safety eyewear
  - Dusk masks and respirators
  - Coveralls
  - Shoe cover
  - Hard hats, etc.
16. Materials, requisition, etc. listing
17. Equipment used for the application of wall finishes

#### **Unit IV – Applying ceiling finishes to structures**

**(25 hours)**

#### **Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

3. define the term ‘ceiling finish’
4. state the types of ceiling finishes
5. discuss the criteria for the selection of ceiling finishes

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

### **Content:**

The content should include but is not limited to:

1. Definition of ceiling finishes
2. Criteria for the selection of ceiling finishes
3. Types of ceiling finishes
  - a. False ceilings
  - b. Suspended ceiling
  - c. Ordinary ceilings, etc.
4. Waterproofing of ceiling finishes
5. Personal Protective Equipment
  - a. Odour masks
  - b. Ladder safe shoes
  - c. Protective eyewear
  - d. Hard hats
  - e. Ear puffs, etc.
6. Materials and equipment for ceiling finishes

## **Unit V – Applying roof finishes**

**(30 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. define the term ‘roof finish’
2. different between various types of roof finishes
3. discuss the criteria for the selection of roof covering materials
4. calculate the amount of material required according to specifications
5. prepare material and other requisition listings based on the project specifications

6. select appropriate PPE to be used throughout the project
7. demonstrate the ability to prepare the roof surface for finishes according to specifications
8. select appropriate materials and equipment to be used for roof finish applications
9. outline the sequence of finishing operations according to job specification
10. demonstrate the ability to carry out roof finishes operations using a specified finish
11. apply specified roof finishes to a structure
12. carry out waterproofing inspections and applications as required
13. perform cleanup and safety checks of completed tasks

**Content:**

The content should include but is not limited to:

1. Roof finish definition
2. Types of roof finishes
  - a. Slates
  - b. Asphalt shingles
  - c. Steel
  - d. Metal
  - e. Wood
  - f. Concrete
  - g. Membrane roofing
  - h. Spray foam
  - i. Clay and concrete tiles
  - j. Tar paper, etc.
3. Criteria for selecting specific type of roof finishes
4. Materials and equipment to be used for roof finish applications
  - a. Cordless drill
  - b. Roofing hammer
  - c. Utility knives
  - d. Tape measure
  - e. Roofing nails and nail gun
  - f. Tool belt
  - g. Cutter
  - h. Ladder, etc.
5. Personal Protective Equipment
  - a. Hard hats
  - b. Protective eyewear
  - c. Gloves
  - d. Harnesses
  - e. Guardrails, etc.
6. Waterproofing of roof finishes

**METHODS OF DELIVERY:**

The methods should include but is not limited to:

6. Practical Demonstration
7. Lectures
8. Discussions
9. Research
10. Group Work
11. Individual Assessments
12. Presentations
13. Case Studies
14. Problem Solving
15. Field Trips
16. Field Activities

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

<b>On-going Assessment Requirements</b>			
<b>No.</b>	<b>Suggested Unit/Unit Cluster</b>	<b>Assessment Strategy</b>	<b>Weight</b>
<b>1</b>	<b>I, II, III, IV, V</b>	Portfolio & Oral Presentation	20%
<b>2</b>	<b>II</b>	Group Practical	30%
<b>3</b>	<b>III</b>	Individual Practical	25%
<b>4</b>	<b>IV &amp; V</b>	Group Practical	25%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:****Prescribed:**

Levy, S. (2000). *Construction Building Envelope and Interior Finishes Databook*. McGraw-Hill Publisher.

**Recommended:**

Yacob, S., Ali. A., & Au-Yong, C. (2022). *Managing Building Deterioration*. Springer Berlin Heidelberg.

**Other online resources:**

EBSCOhost database – <https://www.ebscohost.com/>

Springer E-Books – <http://link.springer.com/>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Applying the Principles of Physics and Chemistry to Construction
<b>COURSE CODE:</b>	CSPC1213
<b>CREDITS:</b>	3
<b>CONTACT HOURS:</b>	45 (45 hours theory)
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	III

## **COURSE DESCRIPTION:**

This course is designed to introduce learners to the principles of physics and chemistry and their individual as well as combined application to construction. Learners will be exposed to the fundamentals and importance of chemical processes from which basic raw materials such as cement, mortar, steel, glass, paints, varnishes that are used in the construction of structures etc., are manufactured. They will also learn about the application of physics in determining how a building interacts with its environment in terms of energy, heat, sound, air movement and moisture. The learners will also cover contents relating to Newton's laws, static, dynamics, atomic structures, and properties of building materials applicable to the construction industry.

## **COURSE OUTCOMES:**

Upon successful completion of this course, learners will be able to:

1. explain the physical and chemical properties of building materials
2. differentiate between angular and linear velocity
3. calculate force, speed, velocity, efficiency, momentum, work power, energy, and friction
4. differentiate between hydrostatic and hydrodynamic
5. calculate relating to hydrodynamic situations (floatation, Archimedean Principle, etc.)
6. determine how building materials behave when used in construction
7. demonstrate an understanding of types of forces on structural members
8. understand the importance of center of gravity to structures
9. apply the principles of physics and chemistry to predict the performance of structures in construction

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

12. differentiate between static and dynamics
13. distinguish between linear and angular motions
14. differentiate between work, energy, and power
15. calculate work done
16. solve energy related problems
17. determine power used to carry out a construction related task
18. explain the relationship between work, power, and energy
19. state the difference between friction, speed, and velocity
20. determine the velocity ratio of a simple machine used in construction
21. calculate the efficiency of a machine used in construction
22. state the law of conservation of linear momentum, applicable to construction
23. explain the application of Newton's Law to construction
24. differentiate between linear dynamics and rotational dynamics
25. analyze bodies in linear motion
26. calculate frictional force
27. use newton's laws to solve problems in building
28. analyze bodies in angular motions

**Content:**

The content should include but is not limited to:

1. Discuss static, moments, forces, torque, mass and weight, scalars and vectors equilibrium, dynamics, kinematics
2. Apply the laws of motion, velocity, acceleration
3. Linear motion vs. rotational/angular motion
4. Principles of statics and dynamics
5. Discuss and calculate energy, work, and power
6. Explain the work-energy theorem
7. Types of energy [mechanical (potential, kinetic), chemical, thermal, nuclear, radiant, electric, etc.]
8. Calculate potential and kinetic energy
9. Calculate friction, speed, and velocity
10. Mechanisms (simple machines) and their application to construction
11. Calculating mechanical advantage, velocity ratio and efficiency

## Unit II – Applying the principles of physics to forces and moments for structures (12 hours)

### Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. understand the fundamental units in physics along with their corresponding SI units
2. define the term force
3. state the SI unit for force
4. evaluate the effects of various types of forces on a structure
5. differentiate between concurrent and non-concurrent forces
6. apply the polygon principle to determine the resultant force acting on a structure
7. calculate the magnitude and direction of a resultant force acting on a structure
8. calculate tensions in loaded system
9. apply Lami's Theorem to for systems
10. state the principle of moments
11. explain the conditions of equilibrium of a body under the influence of a system of parallel forces
12. use the principles of moments to calculate the reactions of a simple loaded beam
13. differentiate between concentrated and distributed loads
14. apply the principles of physics to calculate uniform distributed loads
15. assess the relevance of the principles of moments to construction
16. evaluate the significance of center of gravity for structures in construction

### Content:

The content should include but is not limited to:

1. Fundamental lengths
  - Lengths – m, mm, etc.
  - Temperature – kelvin, etc.
  - Time – minutes, seconds, etc.
  - Mass – kilogram
  - Force – N, kN
2. Definition of forces
3. Types of forces and their impact on structures
  - a. Compressive
  - b. Tensile
  - c. Weight
  - d. Shear force
4. Concurrent and non-concurrent forces
5. Polygon of forces
6. Lami's Theorem
7. Resolution of forces
8. Moments of force
9. Principles of moments



10. Conditions necessary for systems in equilibrium
11. Center of gravity and its application to construction
12. Loads
  - a. Concentrated
  - b. Distributed

### **Unit III – Applying the principles of Physics – Hydrostatics and Hydrodynamics (9 hours)**

#### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. identify the major properties of fluids
2. explain pascal principles
3. understand the principles of the hydraulic jack, applicable to construction
4. explain the principles of hydrostatics
5. describe the physical properties of water
6. discuss liquids in motion and the principles applicable to construction
7. differentiate between hydrostatics and hydrodynamics
8. distinguish between open and closed channels
9. calculate fluid pressure in hydraulic jacks
10. calculate pressure at boundaries of immiscible liquids in tanks
11. determine cross-sectional area, wetted perimeter, and hydraulic radius of open channel
12. calculate flow rate in composite shaped open channels

#### **Content:**

The content should include but is not limited to:

16. State of matter
17. Hydrological cycle
18. Main properties of water
19. Fluids (Statics vs. Dynamics)
20. Properties of fluids (density, viscosity, temperature, pressure, specific volume, specific weight, specific gravity)
21. Principles of hydrostatics and its application to construction
22. Hydrostatic equilibrium
23. Principles of hydrodynamics and its application to construction
24. Force and Pressure (Applying Pascal's Principle)
25. Calculating fluid pressure in hydraulic jacks
26. Determining the wetted perimeter of open channels
27. Determining the hydraulic radius of open channels

28. Determining flow rate in open channels

**Unit IV – Apply the principles of chemistry – structure and state of matter (6 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. describe the structure of an atom
2. use Bohr's Model to construct a model outlining the components of an atom
3. outline the composition of molecules, elements, compounds and alloys
4. explain kinetic theory of matter
5. explain the nature of matter for solids, liquids, and gases, applicable to construction
6. distinguish between ionic and covalent bonding

**Content:**

The content should include but is not limited to:

18. Overview of Atomic Structure
19. Atomic Particles (protons, electrons, neutrons)
20. Atomic Mass
21. Volume of atoms
22. Composition of molecules, elements, compounds, alloys
23. Kinetic theory of matter
24. Nature of matter for solids, liquids and gases
25. Bonding (ionic bonds, covalent bonds, metallic bonds)

**Unit V – Applying the principles of Chemistry - Building Materials (10 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. determine the states of matter for solid, liquid, and gases
2. explain how matter undergoes changes in state by gaining or losing energy
3. differentiate between compound and mixtures
4. discuss different solid materials and liquid materials used in building systems
5. identify the elements in periodic table based on grouping
6. produced a detailed drawing of a structure for a specified element
7. illustrate ionic and covalent bonding
8. write chemical formulae of typical compounds used in buildings
9. balance chemical equations
10. assess the importance of the use of alloys in construction

11. differentiate between metals and non-metals
12. discuss the use of plastic materials in construction
13. explain the use of polymers in construction
14. explain the importance of studying the properties of building materials
15. discuss the physical properties of specified building materials for construction

**Content:**

1. Properties of matter and its applications to construction
2. Changes in matter (physical, chemical) and its applications to construction
3. Compounds (ionic compounds, covalent compounds)
4. Mixtures (homogeneous and heterogeneous)
5. Periodic table of elements
6. Application of elements to building materials and construction
7. Drawing atomic structure
8. Different compound materials used in building systems (concrete, timber, aluminum, plastics, glass, mild steel, etc.)
9. Chemical formulae of typical compounds used in buildings (Portland Cement, Gypsum plasters, etc.)
10. Balancing chemical equations and its application to material used in construction

**METHODS OF DELIVERY:**

- 17. Lectures**
- 18. Discussions**
- 19. Research**
- 20. Group Work**
- 21. Individual Assessments**
- 22. Presentations**
- 23. Case Studies**
- 24. Problem Solving**

<b>On-going Assessment Requirements</b>			
<b>No.</b>	<b>Suggested Unit/Unit Cluster</b>	<b>Assessment Strategy</b>	<b>Weight</b>
<b>1</b>	<b>I</b>	Individual Assignment 1	20%
<b>2</b>	<b>II</b>	Exhibition and demonstration	30%
<b>3</b>	<b>III</b>	Individual Assignment 2	20%

<b>4</b>	<b>IV &amp; V</b>	Interview	30%
<b>Total</b>			<b>100%</b>

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

**RESOURCE MATERIAL:**

**Prescribed:**

Munby, A. (2018). *Introduction to the Chemistry and Physics of Building Materials*. Creative Media Partners, LLC

**Recommended:**

Hansen, P. (2009). *The Science of Construction Materials*. Springer Berlin Heidelberg.

**Other online resources:**

EBSCOhost database – <https://www.ebscohost.com/>

Springer E-Books – <http://link.springer.com/>

Learn from MY FAILURE - A Building Science Lesson  
<https://www.youtube.com/watch?v=30Jy2RTBd88>

The Art Of Building Science - Introduction - video  
<https://www.youtube.com/watch?v=s9OqXFLhNY>

Worst Architecture Decision Award Goes To...  
<https://www.youtube.com/watch?v=vBy38HQvMG4>

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Performing Construction/Project Planning Techniques
<b>COURSE CODE:</b>	CSCT2224
<b>CREDITS:</b>	Three (3)
<b>CONTACT HOURS:</b>	75
<b>PRE-REQUISITE(S):</b>	None
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	

## 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.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. Develop sound project management skills.
2. Plan, organize and control resources effectively and efficiently in project management.
3. Implement construction projects within agreed procedures and to specification.
4. Be able to evaluate construction project outcomes.
5. Be able to present construction project outcomes.

## UNIT I – SAFETY, MANAGEMENT PROCESSES AND RESOURCES (6 hours)

### Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

CCCIJ-OCII/OAD Construction Site Management

Implementation Date: 2022 September

Version: 1.3

Issue Date: 2022 August 19

Last updated: 2023 August 22

29. Examine the process for procuring construction work.
30. Criticize the processes for managing and controlling the operation of resources and safety requirements for construction work.
31. Differentiate between different types of contracts.
32. Examine contract documents.
33. Explain the purpose of quality control, quality assurance, total quality management and quality in construction.
34. Describe factors influencing the production of Construction.
35. Explain the procedures for tendering.
36. Outline the procedure for submission of tender for the award of contracts.

**Content:**

1. Procurement and rules governing procurement
2. Safety requirements for construction work
3. Contracts management
4. Quality assurance, quality control and how each differ
5. Factors that contribute to delays in construction projects
6. Tendering process

**UNIT II -THE STRUCTURE OF A PROJECT**

**(18 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. Examine the construction project life cycle.
2. Describe how the monitoring of construction work is done during the contract period.
3. Explain the process of planning and scheduling activities for a typical project.
4. Explain the various planning techniques used on a construction project.
5. Predict activity durations for activities on a construction project.
6. Demonstrate the use of various planning and scheduling methods.
7. Calculate the critical path for different networks.
8. Prepare construction programmes for given projects.
9. Outline job into different activities for the purposes of scheduling.
10. Use relevant techniques for production and presentation of building projects.

**Content:**

29. Project life cycles
30. Developing work breakdown structures
31. Steps for effective monitoring of construction projects

32. Network scheduling
33. Determining realistic activity durations
34. Calculating forward and backward pass (early start, early finish, late start and late finish values)
35. Determining the critical path of a given network
36. Using Microsoft Projects to produce Gantt Charts, Network Diagrams

### **Unit III – RISK MANAGEMENT**

**(9 hours)**

#### **Learner Outcomes:**

26. Define and explain risk management.
27. Explain the term earned value analysis and list the importance of same.
28. Evaluate a range of planning, organizational and control techniques with regard to utility and efficacy.
29. List the attributes of an effective project manager.
30. State the advantages and disadvantages of cultural differences in construction.

#### **Content:**

1. Risk management
2. Earned value analysis and its effectiveness
3. Risk estimation
4. Attributes of an effective project manager
5. Cultural differences in the construction industry

### **Unit IV – PLANNING FOR SITE LAYOUT**

**(15 hours)**

#### **Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

17. Analyze access and traffic routes when doing site layout.
18. Examine proper procedure for materials storage and handling.
19. Identify Administration offices; welfare, storage and other buildings.\
20. Appraise plants, workshop and services needed.
21. Discuss security and safety measures required for large site.

#### **Content:**

1. Planning for safe and effective traffic routes when completing site layout plan.
2. Procedures for storage and handling of various construction materials.
3. Strategic placement of site offices, storage rooms and other temporary structures on site.

4. Determining required plants, equipment and related services to complete a project.
5. Safety procedures to be instituted for large construction sites.

## **Unit V – PROJECT EXECUTION**

**(15 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. Produce a record of all project procedures used.
2. Use an agreed format and appropriate media to present the outcomes of the project to an audience.
3. Prepare communication plans that demonstrate how relevant stakeholders are kept informed during a project's execution.
4. Generate change management plans that will detail justification of changes to original project plan.
5. Produce status reports to detail the status of projects being executed.

### **Content:**

1. Project records and their uses.
2. Formats of presenting project outcomes.
3. Developing communication plans.
4. Generating change management plans.
5. Preparing status reports

## **Unit VI – PROJECT EVALUATION**

**(12**

**hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. Use appropriate project evaluation techniques.
2. Interpret and analyze the results in terms of the original project specifications.
3. Make recommendations and justify areas for further consideration.
4. Properly hand over construction projects to clients after project completion.

### **Content:**

1. Detailed analysis of results



2. Critical analysis against the project specification and planned procedures.
3. Conclusions and recommendations based on detailed project analysis.
4. Evaluation and review techniques (PERT).
5. Procedures involved in properly handing over construction projects when completed.

**METHODS OF DELIVERY:**

25. Lectures
26. Discussions
27. Research
28. Group Work
29. Individual Assessments
30. Presentations
31. Case Studies
32. Problem Solving

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

<b>On-going Assessment Requirements</b>			
<b>No.</b>	<b>Suggested Unit/Unit Cluster</b>	<b>Assessment Strategy</b>	<b>Weight</b>
<b>1</b>	<b>I, II, II, IV</b>	Group Project	20%
<b>2</b>	<b>I, II, III, IV</b>	Case Study	30%
<b>3</b>	<b>V</b>	Group Presentation	20%
<b>4</b>	<b>II, III, IV, V, VI</b>	Major Project	30%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:**

**Prescribed:**

**Recommended:**

CCCI-OCH/OAD Construction Site Management  
 Version: 1.3  
 Issue Date: 2022 August 19  
 Last updated: 2023 August 22

Implementation Date: 2022 September

Nunnally, S. W. (2007). Construction methods & management 7th edition. New Jersey: Pearson Prentice Hall.

**Other online resources:**

# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

<b>COURSE NAME:</b>	Determining Bills of Quantity for Superstructure
<b>COURSE CODE:</b>	CSBQ2222
<b>CREDITS:</b>	Three (3)
<b>CONTACT HOURS:</b>	45
<b>PRE-REQUISITE(S):</b>	Determining Bill of Quantities for Substructure
<b>CO-REQUISITE(S):</b>	None
<b>SEMESTER:</b>	

## COURSE DESCRIPTION:

This course is designed to expose students to the cost principles and cost analysis of construction projects, including classification of work, construction operation cost, and preparation of tenders. The focus is primarily on the superstructure of buildings, though some principles are the same when treating with the building's substructure. The course combines theoretical and practical elements aimed at providing students with a basic understanding of the principles involved and practical experience in the measurement and analysis of construction work.

## COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

6. Determine quantities for different components of the building's superstructure.
7. Understand the overall principles categorizing work under different work components.
8. Elaborate on the unit of measurement used in computing various quantities for building works.
9. Demonstrate competence in developing dimension, abstract and billing sheets under each component.
10. Prepare tenders based on analysis of building drawings.

## UNIT I – PRELIMINARIES FOR DETERMINING QUANTITIES

(3 hours)

### Learner Outcomes:

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Upon successful completion of this unit, learners will be able to:

37. List general take off rules
38. Elaborate on the various documents within bills of quantities.
39. Apply principles when generating dimension, abstract and billing sheets.

**Content:**

1. Rules governing the takeoff process
2. Documents that comprise bills of quantities.
3. Proper formulation of the dimension, abstract and billing sheets.

**UNIT II -MEASUREMENT OF BLOCK WALLS**

**(9 hours)**

**Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. Differentiate between walls of different thicknesses.
2. Calculate required reinforcement for block walls.
3. Breakdown wall quantities from units of measurements to units of scale.
4. Compute the mean girth for the inner and outer wall skins.
5. Prepare dimension, abstract and billing sheet for wall quantities.

**Content:**

37. Treating with different wall thicknesses.
38. Unit of measurement for measuring blockwork.
39. Moving from units of measurements to units of scale.
40. Determining quantities for reinforcement of block wall after consulting working drawings.
41. Justify the calculation of the mean girth in determining wall quantities.
42. Generating dimension, abstract and subsequently billing sheets for wall quantities.

**Unit III – MEASUREMENT OF FLOORS**

**(9 hours)**

**Learner Outcomes:**

31. Formulate a logical sequence of taking off as it relates to a suspended timber floor.
32. Separate the costs for the construction of the flooring from the floor finishes to minimize error.
33. Determine various means of determining the required quantities of joists required for timber flooring.
34. Compute the required quantities for strutting and floor boarding.
35. Elaborate on the importance of the different components of a typical reinforced concrete slab on grade.
36. Calculate the required materials for constructing typical concrete slabs.
37. Prepare dimension, abstract and billing sheet for floor quantities.

**Content:**

1. Sequencing taking off activities for timber floors.
2. Floor construction cost versus finishing costs.
3. Determining appropriate spacing for joists on timber floors for different categories of buildings.
11. Determining the required quantities of materials for the joists and floor frame.
12. Components that make up a typical concrete slab on grade.
13. Unit of measurement for concrete floors.
14. Quantities of materials required to construct a typical concrete slab such as hardcore, blinding, etc.
15. Generating dimension, abstract and subsequently billing sheets for floor quantities.

**Unit IV - MEASUREMENT OF ROOFING COMPONENTS**

**(9 hours)**

**Learner Outcomes**

Upon successful completion of this unit, learners will be able to:

22. Subdivide the works for flat and pitched roof into different sections for the purpose of measurement.
23. Determine the quantities for different framing members of a typical timber roof.
24. Compute quantities for roof covering materials.
25. Calculate the required material for reinforcement in slab roofs after consulting with working drawings.
26. Determine the required cubic yards of concrete required to complete various roof slabs.
27. Prepare dimension, abstract and billing sheet for roofing quantities.

**Content:**

1. Categorize works under the headings of construction and covering.
2. Calculating the number of common rafters, purlins, jack rafters, etc.
3. Measurement of roof coverings.
4. Quantities required for main bars, distribution bars, over support bars, etc.

5. Thickness of roof slabs.
6. Required concrete based on volume of form.
7. Generating dimension, abstract and subsequently billing sheets for roof quantities.

## **Unit V - INTERNAL FINISHES**

**(6 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

6. Prepare a logical schedule of work sections, covering and finishes.
7. Determine quantities for at least two finishing areas under each section.
8. Prepare dimension, abstract and billing sheet for finishing works.

### **Content:**

1. Work section classifications.
2. Types of finishing work.
3. Quantities and units of measurement used to compute different types of finishes.
4. Generating dimension, abstract and subsequently billing sheets for superstructure finishes.

## **Unit VI - WINDOWS AND DOORS**

**(9 hours)**

### **Learner Outcomes:**

Upon successful completion of this unit, learners will be able to:

1. Determine a systematic method of measuring windows that omits the risk of eliminating items or components.
2. Accurately differentiate between internal and external doors based on given sizes.
3. Calculate components required to properly install doors and windows.
4. Prepare dimension, abstract and billing sheet for related quantities.

### **Content:**

1. Logical sequence when doing window calculations
2. Internal versus external doors

3. Door jambs, window sills, reveals, etc.
4. Generating dimension, abstract and subsequently billing sheets for related quantities.

**METHODS OF DELIVERY:**

33. Lectures
34. Discussions
35. Research
36. Group Work
37. Individual Assessments
38. Presentations
39. Case Studies
40. Problem Solving

**METHODS OF ASSESSMENT AND EVALUATION: Continuous assessment**

<b>On-going Assessment Requirements</b>			
<b>No.</b>	<b>Suggested Unit/Unit Cluster</b>	<b>Assessment Strategy</b>	<b>Weight</b>
<b>1</b>	<b>I, II, II, IV</b>	Group Project	20%
<b>2</b>	<b>I, II, III, IV</b>	Case Study	30%
<b>3</b>	<b>V</b>	Group Presentation	20%
<b>4</b>	<b>II, III, IV, V, VI</b>	Major Project	30%
<b>Total</b>			<b>100%</b>

**RESOURCE MATERIAL:**

**Prescribed:**

**Recommended:**

Building Quantities Explained Sixth Edition

CCCI-OCII/OAD Construction Site Management

Implementation Date: 2022 September

Version: 1.3

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By Ivor H. Seeley and Roger Winfield

**Other online resources:**



# THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

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