

Quantity Surveying - National Diploma (ND)

Curriculum and Course Specifications - 2001

National Board for Technical Education

PLOT B, BIDA ROAD, P.M.B. 2239 KADUNA - NIGERIA

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING

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General Information

1.0 CERTIFICATION AND TITLE OF PROGRAMME

The certificate to be awarded and programme title shall be:

“NATIONAL DIPLOMA IN QUANTITY SURVEYING”.

A statement showing all the courses taken and grades obtained shall be issued together with the certificate.

2.0 GOAL AND OBJECTIVES

The National Diploma programme in Quantity Surveying is aimed at producing technicians that are capable of performing basis functions in Quantity Surveying Practice both in private and public sector.

The objectives are to produce a diplomate that will assist the professional Quantity Surveyor in the areas of:

1. Preparation of Bills of Quantities and Specifications for minor works.
2. Preparation of Tender documents for minor works.
3. Management of small projects.
4. Costing of simple construction works.
5. Cost control techniques in minor construction and engineering works
6. Selection of materials and techniques for new building systems.

3.0 ENTRY REQUIREMENTS

Applicants with any of the following qualifications may be considered for admission into the National Diploma programme by direct entry.

- a. S.S.S.C. or its equivalent (N.T.C., W.A.S.C., G.C.E. O'Level) with credit in Physics and Mathematics and any other two subjects from the following: Further Mathematics, Fine Art/Technical Drawing, Geography, Economics, English Language, Chemistry/Biology, Agricultural Science obtained at not more than two sittings. Candidates are expected to have at least a pass in English Language.
- b. Four credit passes in relevant subjects as stated in (i) above obtained at the final examination of an NBTE recognized preliminary ND programme offered in a polytechnic or similar post-secondary technical institution.

4.0 CURRICULUM

4.1 The curriculum of the ND programme consists of four main components. These are:

- a. General Studies/Education
- b. Foundation Courses
- c. Professional Courses
- d. Supervised Industrial Work Experience Scheme (SIWES)

4.2 The General Education component should include courses in Art and Humanities - English Language, Citizenship Education, Social Studies, Citizenship (the Nigerian Constitution), Political Science, Sociology, Philosophy, Geography and Entrepreneurship. The General Education component shall account for not more than 15% of total contact hours for the programme.

4.3 Foundation courses include courses in Economics, Mathematics, Pure Science, Technical Drawing, Descriptive Geometry, Statistics etc. The number of hours will vary with the programme and may account for about 10-15% of the total contact hours.

4.4 Professional Courses are course which give the students the theory and practical skills he needs to practice his profession at the technician/technologist level. These may account for between 70-80% of the total contact hours.

4.5 Supervised Industrial Work Experience Scheme (SIWES) shall be taken during the long vacation following the end of the second semester of the first year. See details of SIWES at paragraph 11.0

5.0 STAFFING

5.1 For ND programme only, the minimum requirement will be five (5) teaching staff with at least one Senior Lecturer and one Lecturer I.

5.2 For ND and HND combined programmes, the minimum requirement will be seven (7) teaching staff with at least one chief/Principal Lecturer, 2 Senior Lecturer, 2 Lecturer I.

5.3 The person appointed to head the Department of Quantity Surveying for ND and HND programmes must be an Associate Member of NIQS and registered with QSRBN in addition to the existing academic qualification.

6.0 FACILITIES

6.1 Workshop and Laboratories

6.1.1 The Building Technology workshops must be available and functional (Carpentry Workshop, Painting and Decorating Workshop, Concrete Workshop and Plumbing Workshop).

6.1.2 The Mechanical and Electrical Workshops must be available and functional.

6.1.3 The Civil Engineering Structure/Maintenance Services, Laboratories must exist and be functional.

6.1.4 The Computer Centre must exist and be functional.

6.1.5 In addition to the provision of these physical facilities, the appropriate technologists and technicians must be available in line with the existing NBTE specification requirements.

6.2 Offices and Classrooms

6.2.1 Functional offices which are well equipped with furniture, fans, and air-conditioners should be provided for all staff.

6.2.2 All staff on the rank of Senior Lecturer and above should have individual offices and others should not be more than two in an office. They should be furnished with writing desks and chairs, visitor chairs and bookshelves. In addition to the above, the Head of Departments should have Easy chairs with Centre Table, Filing cabinets, Refrigerator, and Rug Carpet.

6.2.3 Adequate classrooms which are well equipped with Chairs and Tables, together with teaching boards should be provided. A minimum of four classrooms should be provided for the ND and HND programmes.

7.0 CURRICULUM STRUCTURE FOR THE ND PROGRAMME

The structure of the ND programme consists of four semesters of classroom, laboratory and workshop activities in the college - and a semester (3-4 months) of supervised industrial work experience scheme (SIWES). Each semester shall be of 17 weeks duration made up as follows:

15 contact weeks of teaching i.e. lecture, recitation and practical exercise, etc. and 2 weeks for tests, quizzes, examinations and registration. SIWES shall take place at the end of the second semester of the first year.

8.0. ACCREDITATION

Each programme offered at the ND level shall be accredited by the NBTE before the diplomats can be awarded the diploma certificates. Details about the process of accrediting a programme for the award of the ND are available from the Executive Secretary (at the Programmes Department). National Board for Technical Education.

9.0 CONDITIONS FOR THE AWARD OF THE ND

Institutions offering accredited programmes will award the National Diploma in Quantity Surveying to candidates who successfully complete the programme after passing prescribed coursework, examinations, diploma experience. Such candidates should have completed a minimum of 72 semester credit units.

10.0 GUIDANCE NOTES FOR TEACHERS TEACHING THE PROGRAMME

10.1 The new curriculum is drawn in unit courses. This is in keeping with the provision of the National Policy on Education which stress the need to introduce the semester credit units which will enable a student who so wish to transfer the units already completed in an institution of similar standard from which he is transferring.

10.2 In designing the units, the principle of the modular system by product has been adopted thus making each of the professional modular, when completed provide the student with technician operative skills, which can be used for employment purposes.

10.3 As the success of the credit unit system depends on the articulation of programmes between the institutions and industry, the curriculum content has been written in behavioural objectives, so that it is clear to all, the expected performance of the student who successfully complete some of the courses or the diplomats of the programme. There is a slight departure in the presentation of the performance based curriculum which requires the conditions under which the performance are expected to be carried out and the criteria for the acceptable levels of performance. It is a deliberate attempt to further involve the staff of the department teaching the programme to write their own curriculum stating the conditions existing in their institution under which the performance can take place and to follow that with the criteria for determining an acceptable level of performance. Departmental submission on the final curriculum may be vetted by the Academic Board of the institution. Our aim is to continue to see to it that a solid internal evaluation system exists in each institution for ensuring minimum standard and quality of education in the programme offered throughout the polytechnic system.

10.4 The teaching of theory and practical work should, as much as possible, be integrated. Practical exercises, especially those in professional courses and laboratory work should not be taught in isolation from the theory. For each course, there should be a balance of theory to practice depending on the course and contents.

11.0 GUIDELINE OF SIWES PROGRAMME

For the smooth operation of the SIWES, the following guidelines shall apply:

11.1 Responsibility for Placement of Students

- a. Institutions offering the ND Programme shall arrange to place the students in industry. By April 30 of each year, six copies of the master list showing where each student has been placed shall be submitted to the Executive Secretary, NBTE which shall, in turn, authenticate the list and forward it to the Industrial Training Fund
- b. The Placement Officer should discuss and agree with industry on the following:
 - c. a task inventory of what the students should be expected to experience during the period of attachment. It may be wise to adopt the one already approved for each field;
 - d. an industry-based supervisor of the students during the period, likewise the institution based supervisor.
 - e. The evaluation of the student during the period. It should be noted that the final grading of the student during the period of attachment should be weighted more on the evaluation by his industry based supervisor.

Evaluation of Students During the SIWES

- a. In the evaluation of the students, cognizance should be taken of the following items:
 - b. Punctuality
 - c. Attendance
 - d. General Attitude to work
 - e. Respect for Authority
 - f. Interest in the Field/technical area
 - g. Technical competence as a potential technician in his field.

The Institution-based Supervisor

The institution-based supervisor should look into the log book during each visit. This will enable him to check and determine to what extent the objectives of the scheme are being met and to assist students having any problems regarding the specific assignments given to them by their industry-based supervisor.

Frequency of Visit

Institution should ensure that students placed on attachment are visited within one month of their placement. Other visits should be arranged so that:

- a. There is another visit six weeks after the first; and
- b. a final visit in the last month of the attachment

Stipend For Students in SIWES

The rate of stipend payable shall be determined from time to time by the Federal Government after due consultation with the Federal Ministry of Education, the Industrial Training Fund and NBTE.

SIWES As a Component of the Curriculum

The completion of SIWES is important in the final determination of whether the student is successful in the programme or not. The SIWES should be graded following the normal grading system adopted by the institution. Where a student is judged to have failed the SIWES, he should repeat another four months SIWES at his own expense.

Computation of Final Result

A computation of second semester result of the second year shall include the grade scored by the student at SIWES

Curriculum Table

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING

YEAR OF STUDY: ONE

SEMESTER: ONE

COURSES CODE	COURSE TITLE	L	T	P	CU	CH	Prerequisite
MTH 111	Logic and Linear Algebra	1	1	-	2	2	O/L Maths
GNS 101	Use of English I	2	-	-	2	2	O/L English
SUG 101	Basic Principles in Surveying I	1	-	2	2	3	Maths/Phy
MEC 101	Technical Drawing	1	-	2	2	3	O/L Tech.Dr.
QUS 101	Introduction to Measurement	1	1	-	2	2	O/L Maths
QUS 103	Basic Engineering Science	2	-	2	3	4	Phy & Maths
QUS 105	Wood Workshop Practice	1	-	3	2	4	O/L T/Draw
QUS 107	Principles of Economics	2	-	-	2	2	O/L Econs
BLD 103	Building Construction	2	-	2	3	4	
SDV 210	Entrepreneurship Development I	1	-	1	1	2	
GNS 111	Citizenship Education	2	-	2	2	4	
	TOTAL	16	2	14	23	32	

SEMESTER TWO

COURSE CODE	COURSE TITLE	L	T	P	CU	CH	Prerequisite
MTH 112	Algebra and Elementary Trigonometry	1	1	-	2	2	MTH111
GNS 102	Communication in English I	2	-	-	2	2	
SUG 102	Basic Principles in Surveying II	1	-	2	2	3	SUG 101
QUS 102	Measurement of building Works	2	-	2	3	4	QUS101
QUS 104	Properties of Materials	1	-	2	2	3	QUS103
QUS 106	Block-laying and Concreting Workshop Practice	-	-	3	1	3	-
QUS 108	Principles of Accounts	1	1	-	2	2	-
QUS 110	Principles of Law	2	-	-	2	2	-
QUS 112	Introduction to Engineering Geology	1	-	2	2	3	-
BLD 104	Building Construction II	2	-	3	3	5	BLD103
	TOTAL	13	2	14	21	29	

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING

YEAR OF STUDY: YEAR TWO

SEMESTER: ONE

COURSE CODE	COURSE TITLE	L	T	P	CU	CH	Prerequisite
MTH 211	Calculus	2	-	-	2	2	MTH 111
GNS 201	Use of English II	2	-	-	2	2	GNS 101
QUS 201	Building Measurement and Specification	2	-	2	3	4	QUS 102
QUS 203	Strength of Materials and Structures	1	-	2	2	3	-
QUS 205	Workshop Practice and Technology	-	-	4	2	4	QUS105
QUS 207	Principles of Construction Economics I	1	1	-	2	2	QUS 107
QUS 209	Tendering and Estimating I	1	1	-	2	2	-
QUS 211	Introduction to Soil Mechanics	1	-	2	2	3	QUS 112
QUS 213	Basic Principles of Architectural Design & Drawing	1	-	2	2	3	MEC 101
QUS 215	Building Construction III	2	-	3	3	5	BLD 104
ICT 101	Introduction to computing using packages (WP, SP, and Presentation)	-	-	3	1	3	
	TOTAL	13	2	18	23	33	

SEMESTER TWO

COURSE CODE	COURSE TITLE	L	T	P	CU	CH	Prerequisite
STA 111	Introduction to Statistics	1	1	-	2	2	-
GNS 202	Communication in English II	2	-	-	2	2	GNS 102
QUS 202	Principles of Engineering Measurements	1	-	2	2	3	QUS 201
QUS 204	Principles of Management	2	-	-	2	2	-
QUS 206	Building Services	1	-	2	2	3	-
QUS 208	Principles of Construction Economics II	2	-	-	2	2	QUS 202
QUS 210	Tendering and Estimating II	1	2	-	3	3	QUS 209
QUS 212	Maintenance Technology	1	-	2	2	3	-
QUS 214	Projects	1	-	3	1	4	-
ICT 102	Introduction to programming concepts using Visual Basic	-	-	3	1	3	ICT 101
QUS 216	SIWES	-	-	-	2	-	-
	TOTAL	12	3	12	21	27	

General Studies Courses

Use of English I

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: USE OF ENGLISH I (GRAMMAR)		Course Code: GNS 101	Contact Hours: 30Hrs Lectures
Course Specification: Theoretical Content			
General Objective 1.0: It will promote the necessary language skills which will enable student to cope effectively.			
Week	Specific Learning Outcome	Teacher Activities	Resources
1 - 3	1.1 Explain the necessity for acquiring good note-taking/making techniques 1.2 List the methods of note-taking/making 1.3 Explain the use of dictionary 1.4 Explain the use of the library 1.5 Explain the type of information sources in the library 1.6 Identify good reading habits 1.7 Explain the different methods of reading viz, scan, skim, normal and study 1.8 Use the different methods of reading explained in 1.7 above	Ask the students: <ul style="list-style-type: none"> - the techniques of note-taking/making and list the various methods - the correct ways of using the dictionary - the best ways of using the library - to list the various information sources in the library and how to locate these information sources - the different methods of reading and the difference between the methods 	Chalkboard, Duster, Recommended textbooks.

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: USE OF ENGLISH I (GRAMMAR)		Course Code: GNS 101	Contact Hours: 30Hrs Lectures
General Objective 2.0: Understand the basic roles of grammar, know the nature of the language, appreciate literary words in English			
Week	Specific Learning Outcome	Teacher Activities	Resources
4 - 6	2.1 Explain the concept of language 2.2 List the characteristics of language 2.3 Explain the four language skills, viz: speaking, listening, writing, readings 2.4 Explain the functions of language 2.5 List the uses of English language in Nigeria, e.g as the language of research, government, commerce etc.	Ask the students: - the basic concept of language - to mention the characteristics of language - to identify the functions of language - to list the uses of English language in Nigeria	Chalk and Blackboard
General Objective 3.0: Understand the basic rules of grammar			
Week	Specific Learning Outcome	Teacher Activities	Resources
7 - 10	3.1 Explain grammar 3.2 Explain parts of speech 3.3 Analyse the use of parts of speech in sentences 3.4 Correct common errors in the use of parts of speech in sentences 3.5 Explain how to construct sentences with correct syntactic arrangement 3.6 List punctuation marks 3.7 Enumerate the uses of punctuation marks and explain how to punctuate a given passage 3.8 Explain idioms, figures of speech and affrication	Ask the students: - to explain grammar, parts of speech and how to apply them in a sentence - to identify common errors in the use of parts of speech in sentences - to construct sentences with correct syntactic arrangement - to identify punctuation marks and their uses, and how to punctuate a given passage - to construct sentences to illustrate idioms, figure of speech and affixes	Chalk, Blackboard, Duster

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: USE OF ENGLISH I (GRAMMAR)		Course Code: GNS 101	Contact Hours: 30Hrs Lectures
General Objective 4.0: Understanding the essential qualities of paragraph			
Week	Specific Learning Outcome	Teacher Activities	Resources
11 - 13	4.1 Define a paragraph 4.2 Name the parts of a paragraph viz: topic, sentence, development and conclusion/transition 4.3 Explain the thematic qualities of a paragraph viz, unity, coherence and emphasis 4.4 Explain methods of paragraph development viz, example, definition, comparison and contrast etc 4.5 Explain methods of ordering details in a paragraph, viz, less complex to more complex and vice versa, less important to more important and vice versa, spatial, chronological etc. 4.6 Write specific paragraphs to illustrate 4.2 to 4.5 above	Ask the students: - to define a paragraph and to name the part of a paragraph - what the understand by the thematic qualities of a paragraph - to explain the various methods of paragraph development and the methods of ordering details in a paragraph Assess the students	Chalk, Blackboard and Duster
General Objective 5.0: Appreciating Literary works in English			
Week	Specific Learning Outcome	Teacher Activities	Resources
14 - 15	5.1 Give the meaning of literature 5.2 Trace the development of literature 5.3 Differentiate between the literary genres 5.4 Explain the functions of literature 5.5 Explain the terminology of prose fiction, e.g plot setting, characterization etc 5.6 Answer an essay question on a given novel	Ask the students: - the meaning of literature and the development of literature - the functions of literature and the terminology of Prose fiction	Chalk, blackboard, duster

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING		
Course: USE OF ENGLISH I (GRAMMAR)	Course Code: GNS 101	Contact Hours: 30Hrs Lectures
	ASSESSMENT: The continuous assessment, tests and quizzes will be awarded 40% of the total score. The end of the Semester Examination will make up for the remaining 60% of the total score.	

Communication in English I

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: COMMUNICATION SKILL I		Course Code: GNS 102	Contact Hours 30 HRS LECTURES
Course Specification: Theoretical Content			
General Objective 1.0: Acquire the necessary Communication Skills, techniques of correspondence and comprehend within materials			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 4	COMMUNICATION 1.1 Define Communication 1.2 Analyse the process of Communication 1.3 Analyse the purposes of Communication 1.4 Explain the relationship between communication and language. 1.5 Explain the impact of interference on communication at various levels e.g. Phonological, syntactic, e.t.c. 1.6 Explain code-mixing, code-switching and dissonance in communication.	- Teachers are expected to involve the students in Communication Skills, and Speed intonation.	Chalk boards; Text-books, Samples of Formal and informal letters.
5 - 8	ORAL PRESENTATION 2.1 Label a diagram of the organs of speech 2.2 Describe the functions of the organs in 2.1 above in speech production. 2.3 List the phonemes of English 2.4 Produce correctly each of the phonemes listed in 2.3 above. 2.5 Pronounce correctly by making distinctions between the different sound contrasts in the consonantal and vowel systems of English. 2.6 Explain the principles of effective speaking, viz; correct use of stress, rhythm, and information patterns. 2.7 Read fluently.		

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: COMMUNICATION SKILL I		Course Code: GNS 102	Contact Hours 30 HRS LECTURES
General Objective 1.0: Acquire the necessary Communication Skills, techniques of correspondence and comprehend within materials			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9 – 11	<p>CORRESPONDENCE</p> <p>3.1 List the various stype of correspondence, e.g. letter, memo, circular, e.t.c.</p> <p>3.2 Explain the various parts of a letter.</p> <p>3.3 Differentiate between formal and informal letter format.</p> <p>3.4 Explain the characteristics of styles suitable for formal and informal letters.</p> <p>3.5 Explain the functions of the first, middle and last paragraphs.</p> <p>3.6 Write a formal and informal letter.</p>	Give students assignments on various tyope of correspondence.	Chalk boards; Text-books, Samples of Formal and informal letters.
12 - 15	<p>COMPREHENSION AND INTERPRETATION</p> <p>4.1 Identify main ideas in a given passage.</p> <p>4.2 Differentiate the main ideas from the details in a passage.</p> <p>4.3 Use the main idea to anticipate specific details in a passage.</p> <p>4.4 Use context clues to aid comprehension.</p> <p>4.5 Identify relationship patterns of ideas in a passage.</p> <p>4.6 Use context clues such as definitions, restatements and examples to derive meanings.</p> <p>4.4 Interpret figurative language in a passage.</p> <p>4.5 Draw conclusions from available information.</p>	- Teachers should give necessary aids that will assist the comprehension of passage.	Chalk board; Text-books, Samples of Formal and informal letters.

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING		
Course: COMMUNICATION SKILL I	Course Code: GNS 102	Contact Hours 30 HRS LECTURES
	ASSESSMENT: The continuous assessment, tests and quizzes will be awarded 40% of the total score. The end of the Semester Examination make up for the remaining 60% of the total score.	

Communication in English II

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: COMMUNICATION SKILL II		Course Code: GNS 202	Contact Hours 30 HRS LECTURES
Course Specification: Theoretical Content			
General Objective 1.0: Communicate clearly and effectively in both general and specific situations.			
Week	Specific Learning Outcome:	Teacher Activities	Resources
1 - 4	REGISTERS 1.1 Explain registers. 1.2 Explain factors influencing register, viz; field (profession), mode (speech or writing), tenor (relationship between the interacting parties). 1.3 List some items of register peculiar to different professions. 1.4 Identify items of register in a given passage. 1.5 State appropriate use of jargon.	- Teachers to emphasize on the items and importance of registers to different professions.	Text-books, Blackboard, Chalk, Publications, samples of correspondence, Registers and reports.
5 - 7	CORRESPONDENCE 2.1 Describe different types of business letter e.g., applications, enquiries, invitations and complaints, with their replies. 2.2 Use suitable language for a specific type of letter. 2.3 Write the letter listed in 2.1 above.	- Give exercises to students on letter writing and correspondences and assess.	
8 - 11	WRITING FOR PUBLICATION 3.1 Explain techniques of writing for publication. 3.2 Write essays on topical and current issues. 3.3 Analyse published essay of literacy value. 3.4 Evaluate the development of ideas in a given article. 3.5 Write good articles for publication.	- Teachers should involve the class in the analysis of published essays and texts.	

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING		
Course: COMMUNICATION SKILL II	Course Code: GNS 202	Contact Hours 30 HRS LECTURES
Course Specification: Theoretical Content		
General Objective 1.0: Communicate clearly and effectively in both general and specific situations.		
12 - 15	REPORT 4.1 Define a report 4.2 List the types of report 4.3 Enumerate uses of report 4.4 List the characteristics of a good report 4.5 Outline the stage of writing a report 4.6 Evaluate a given report 4.7 Write a report.	- Give detail of report writing to students. Text-books, blackboard, Chalk, Publications, samples of correspondence, Registers and reports.
	ASSESSMENT: The continuous assessment, tests and quizzes will be awarded 40% of the total score. The end of the Semester Examination will make up for the remaining 60% of the total score.	

Use of English II

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: USE OF ENGLISH II		Course Code: GNS 201	Contact Hours 2HRS/WK
Course Specification: Theoretical Content			
General Objective 1.0: Understand the rules of grammar			
Week	Specific Learning Outcome	Teachers Activities	Resources
1 - 3	1.0 Define the phrase 1.2 Explain the different types of phrases, i.e, structural and functional 1.3 Define the clause 1.4 Explain the different types of clauses i.e structural and functional 1.5 Define the sentence 1.6 Explain the different types of sentences, i.e structural and function 1.7 Explain the constitution of different types of sentences	Ask the students: - to identify the different types of phrases - to define a clause and to identify the different types of clauses to define a sentence and to identify the different types of sentences assess the students on the construction of different types of sentences	Chalk, blackboard, duster Recommended textbook, lecture notes, etc.
General Objective 2.0: Know how to write good essays			
Week	Specific Learning Outcome	Teachers Activities	Resources
4 - 5	2.1 List the different types of essays 2.2 Explain the features of each type of essay listed in 2.1 above 2.3 Generate/gather relevant information on a given topic 2.4 Draw up a good outline 2.4 Write a good essay on a given topic	Ask the students to list the different types of essays and to identify the features of each types of essay list above Assess the students on essay writing	Chalk, blackboard, duster Recommended textbook, lecture notes, etc.

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: USE OF ENGLISH II		Course Code: GNS 201	Contact Hours 2HRS/WK
General Objective 3.0: Understand the difference between denotative and connotative uses of words			
Week	Specific Learning Outcome	Teachers Activities	Resources
6 - 8	3.1 Explain the term denotation 3.2 Identify words used denotatively 3.3 Explain the term connotation 3.4 Identify words used connotatively 3.5 Use words connotatively 3.6 Compare denotative and connotative usage in groups of synonyms, e.g, women, lady, female, client, customer, patient, fear, terror, dread etc.	Ask the students to define the terms denotation and connotation and how to identify words used denotatively connotatively Assess the students	Chalk, blackboard, duster Recommended textbooks, lecture notes, etc.
General Objective 4.0: Understand the techniques of comprehension and summary writing			
Week	Specific Learning Outcome	Teachers Activities	Resources
9 - 12	4.1 Answer questions on comprehension passage at a higher level of difficulty 4.2 Give contextual explanations to statements from the texts used 4.3 Identify colloquialisms, slangs and jargons 4.4 Explain summary writing 4.5 Distinguish between types of summary writing 4.6 Explain the steps in summary writing 4.7 Write, within a specified length, a goal summary of a given passage	Ask the students to distinguish the various types of summary writing and the steps in summary writing Give the students passages to summarise Assess the students	Chalk, blackboard, duster Recommended textbooks, lecture notes, etc

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: USE OF ENGLISH II		Course Code: GNS 201	Contact Hours 2HRS/WK
General Objective 5.0: Appreciate literature in English			
Week	Specific Learning Outcome	Teachers Activities	Resources
13 - 15	5.1 Describe drama 5.2 Explain the types of drama 5.3 Explain the terminology of drama, e.g, act, resolution, conflict, denouement, etc 5.4 Distinguish between radio drama and television drama 5.5 Answer an essay question on a given drama text	Ask the students: <ul style="list-style-type: none"> - to identify the various types of drama and to explain the terminology of drama to differentiate between radio drama and television drama to answer essay question on a given drama text. - Assess the students 	Television, video cassette recorder, radio cassette player

Citizenship Education

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: CITIZENSHIP EDUCATION		Course Code: GNS 111	Contact Hours 2HRS/WEEK
Course Specification: Theoretical Content			
General Objective 1.0: Understand the Constitution of Nigeria			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1-4	1.1 Explain the term constitution 1.2 Distinguish the different types of constitution 1.3 Highlight some provisions of an International Constitution 1.4 Explain the effectiveness of International Constitution 1.5 Explain the supremacy of the Nigerian Constitution to other laws with emphasis on the 1989 constitution 1.6 Evaluate the main parts of the Nigeria Constitution 1.7 Draft a constitution for an association 1.8 Trace the historical development of the Nigerian Constitution 1.9 Discuss the merits and demerits of each of the Nigerian constitutions 1.10 Explain the concept of "rule of law"	Ask the students: <ul style="list-style-type: none"> • what their understand by the term constitution and to distinguish the different rules of constitution known • to explain the effectiveness of International Constitution • to explain Nigerian Constitution to other laws. • To identify the main parts of the Nigerian Constitution. Assess to the students by given the assignment to draft a constitution for an association	Chalkboard, duster

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: CITIZENSHIP EDUCATION		Course Code: GNS 111	Contact Hours 2HRS/WEEK
General Objective: 2.0 Understand the federal system of government in Nigeria			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5-7	2.1 Describe a federation 2.2 Distinguish a federation from a confederation 2.3 Outline the basis for the federal system in Nigeria 2.4 Examine the evolution, structure and functions of the federal system in Nigeria. 2.5 Analyse the relationships among the three tiers of government in Nigeria 2.6 Evaluate the revenue allocation formula in operation in Nigeria 2.7 Compare and contrast other federation with Nigeria11	Ask the students: <ul style="list-style-type: none"> • to describe a federation and to differentiate between a federation and a confederation • to define the functions of the federal system in Nigeria and the relationship among the three tiers of government • to evaluate the revenue allocation formula operation in Nigeria 	<ul style="list-style-type: none"> • Chalk, blackboard, duster
General Objective: 3.0 Know the constitutional rights and obligations of Nigerian citizens			
Week	Specific Learning Outcome:	Teachers Activities	Resources
8-9	3.1 Examine the significance of rights and obligations in Nigeria 3.2 Assess government's protection of fundamental rights as contained in the Nigerian constitution 3.3 Evaluate the responsibilities and duties of Nigerian citizenships and the benefits for performing them 3.4 Assess the responsibilities and duties of constituted authority to the people 3.5 Evaluate the responsibilities and duties of government to the People	<ul style="list-style-type: none"> • Ask the students to identify the responsibilities and duties of Nigerian citizenship 	<ul style="list-style-type: none"> • Chalk, blackboard, duster

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: CITIZENSHIP EDUCATION		Course Code: GNS 111	Contact Hours 2HRS/WEEK
General Objective: 3.0 Understand Citizenships			
Week	Specific Learning Outcome:	Teachers Activities	Resources
10-12	4.1 Discuss the significance of citizenship 4.2 Analyse the principles and benefits of citizenship 4.3 Explain the difference in the modes of acquiring citizenship 4.4 Evaluate the merits and demerits of each type of citizenship 4.5 Analyse the basis for the acquisition and withdrawal of Nigerian citizenship 4.5 Examine the benefits derivable from Nigeria citizenship	Ask the students: <ul style="list-style-type: none"> • to discuss and analyse the principles and benefits of citizenship • to analyse the basis for the acquisition and withdrawal of Nigerian citizenship 	<ul style="list-style-type: none"> • Chalk, blackboard, duster
General Objective: 5.0 Fundamental objectives and directive principles of state policy in Nigeria			
Week	Specific Learning Outcome:	Teachers Activities	Resources
	5.1 State the fundamental obligations of government as provided in the constitution 5.2 Explain the general provisions of the fundamental objectives and directive principles of state policy 5.3 Explain the political, economic, social and education policies of Nigeria 5.4 Explain the directive principles and policy of the Nigerian government on culture, the mass media, national ethics and duties of the citizen 5.5 Assess the conformity observance and application of the fundamental objectives and directive principles of state policy by governments and people of Nigeria. 5.6 Recommend improvements on the provision conformity, observance and application of the fundamental objectives and directive principles of state policy	<ul style="list-style-type: none"> • Ask the students to explain the directive principles and policy of the Nigerian • Government on cultures, the mass media, national ethnics and duties of the citizen 	<ul style="list-style-type: none"> • Chalk, blackboard, duster

Mathematics Courses

Algebra and Elementary Trigonometry

General Objectives

On completion of this course the student will be able to:

1. Understand the laws of indices and their application in simplifying algebraic expressions.
2. Understand the theory of logarithms and surds and their applications in manipulating expressions.
3. Understand principles underlying the construction of charts and graphs.
4. Know the different methods of solving quadratic equations.
5. Understand permutation and combination
6. Understand the concept of set theory
7. Understand the properties of arithmetic and geometric progressions
8. Understand the binomial theorem and its application in the expansion of expressions and in approximations.
9. Understand the basic concepts and manipulation of vectors and their applications to the solution of engineering problems.
10. Understand the concept of equations and methods of solving different types of equations and apply same to engineering problems.
11. Understand the definition, manipulation and application of trigonometric functions.

COURSE: ALGEBRA AND ELEMENTARY TRIGONOMETRY		COURSE CODE: MTH 112	CONTACT HOURS: 15 HRS LECTURE 15 HRS TUTORIAL
Course Specification: Theoretical Content			
General Objective 1.0: Understand laws of indices and their applications in simplifying algebra expressions			
Week	Specific Learning Outcomes	Teacher Activities	Resources
1	1.1 Define index 1.2 Establish the laws of indices 1.3 Solve simple problems using the laws of indices.		- Chalkboard, Textbooks, Calculators.
General Objective 2.0: Understand Theory of logarithms surds and their applications in manipulating expression			
Week	Specific Learning Outcomes	Teacher Activities	Resources
2 - 3	2.1 Define logarithm 2.2 Establish the four basic laws of logarithm 2.3 Solve simple logarithm problem 2.4 Define natural logarithm and common logarithm. 2.5 Define characteristic and mantissa 2.6 Read the logarithmic table for given numbers 2.7 Simplify numerical expressions using log tables e.g. e.g. $18 D = 3\%4JPC^2 \wedge M^B$. find D when J = 0935, e.g. $\theta = 35$, $P = 1.6 \cdot 10^6$, $C = 55$, $M = 0025$. $\pi = 3.142$ 2.8 Apply logarithm in solving non-linear equations. e.g. $y = ax^n$; $\log y = \log a + n \log x$; $y = bc^x = \log y = \log b + x \log c$; $Y = a + bx^n$ B $\log (Y B D) = \text{Log} b + n \log x$. 2.9 Define surds 2.10 Reduce a surd into it's simplest form 2.11 Solve simple problems on surds	- Ask the students to solve logarithmic and surd related problems	- do -

COURSE: ALGEBRA AND ELEMENTARY TRIGONOMETRY		COURSE CODE: MTH 112	CONTACT HOURS: 15 HRS LECTURE 15 HRS TUTORIAL
Course Specification: Theoretical Content			
General Objective 3.0: Understand Principles underlying the construction of Charts and graphs			
Week	Specific Learning Outcomes	Teacher Activities	Resources
4	3.1 Construct graphs of functions fractions such as $Y = ax + b, n = 1, 2$ $Y = CST (a+x)$ $Y = ax^k$, including cases of asymbles 3.2 Apply knowledge from 3.1 in determination as laws from experimental data.	- Ask the students to draw graphs	-do-
General Objective 4.0: Know the different methods of solving quadratic equations			
Week	Specific Learning Outcomes	Teacher Activities	Resources
5	4.1 Solve quadratic equations by factorization 4.2 Solve quadratic equations by method of completing squares. 4.3 Solve quadratic equations by formula 4.4 Discriminate the roots. 4.5 Form equations whose roots are given in different methods.	- Ask the students to solve quadratic equations	-do-
General Objective 5.0: Understand Permutations and Combinations			
Week	Specific Learning Outcomes	Teacher Activities	Resources
6	5.1 Define permutation 5.2 State examples of permutations 5.3 Define combination 5.4 State examples of combination 5.5 Establish the theorem $nPr = n! / [(n-r)!]$ giving examples e.g. number of ways of collecting two out of 8 balls	- Give exercises on permutation and combination to them	-do-
General Objective 6.0: Understand the concept of set theory			
Week	Specific Learning Outcomes	Teacher Activities	Resources
7	6.1 Establish ${}^nC_r = {}^nC_n B r$. 6.2 Define sets, subsets, and null sets 6.3 Define union, inter-section and completion of sets 6.4 Draw Venn diagrams to demonstrate the concepts in 6.1 B 6.3 above. 6.5 Calculate the size or number of elements in a given set.	-do-	-do-

COURSE: ALGEBRA AND ELEMENTARY TRIGONOMETRY		COURSE CODE: MTH 112	CONTACT HOURS: 15 HRS LECTURE 15 HRS TUTORIAL
Course Specification: Theoretical Content			
General Objectives 7.0: Understand the properties of arithmetic and geometric progressions			
Week	Specific Learning Outcomes	Teacher Activities	Resources
8 - 9	<p>7.1 Define an Arithmetic progression (A.P.)</p> <p>7.2 Obtain the formula for nth term and the first n terms of an A.P.</p> <p>7.3 Give examples of the above e.g. find the 20th term of the series e.g. 2 + 4 + 6 + Y.. Find also the series of the first 20 terms.</p> <p>7.4 Define a geometric progression (G.P.)</p> <p>7.5 Obtain the formula for the nth term and the first n terms of a geometric series.</p> <p>7.6 State examples of 7.5 above e.g. given the sequences 1/3, 1,3 Y find the 20th term and hence the sum of the 1st 2o terms.</p> <p>7.7 Define Arithmetic Mean (AM) and Geometric Mean (G.M.)</p> <p>7.8 Define convergency of series.</p> <p>7.9 Define divergence of series.</p>	- Ask the students to apply progression to solve problems	-do-
General Objectives 8.0: Understand the binomial theorem and it's application in the expansion of expressions and in approximations.			
Week	Specific Learning Outcomes	Teacher Activities	Resources
10	<p>8.1 Explain the method of mathematical induction</p> <p>8.2 State and prove the binomial theorem for a positive integral index.</p> <p>8.3 Expand expressions of the forms $(x + y)^2$, $(x^2 B 1)^s$ applying binominal theorem</p> <p>8.4 Find the coefficient of a particular term in the expansion of simple binomial expressions.</p> <p>8.5 Find the middle term in the expansion of binomial expression</p> <p>8.6 State the binomial theorem for a rational index.</p> <p>8.7 Expand expressions of the form: $(1 + x)^{-1}$, $(1 B x)^2$. $(1 B x)^{-a}$ applying binomial theorem</p>	- State the importance and application of the theorem	-do-

COURSE: ALGEBRA AND ELEMENTARY TRIGONOMETRY		COURSE CODE: MTH 112	CONTACT HOURS: 15 HRS LECTURE 15 HRS TUTORIAL
Course Specification: Theoretical Content			
	General Objectives 8.0: Understand the binomial theorem and it's application in the expansion of expressions and in approximations.		
Week	Specific Learning Outcomes	Teacher Activities	Resources
10	8.8 Expand and approximate expressions of the type $(1.001)^n$, $(0.998)^n$, $(1 + x)^2$, $(1 - x)^a$ to a stated degree of accuracy applying scalar expressions.	- State the importance and application of the theorem	-do-
11	9.1 State the definitions and representations of vectors. 9.2 Define a position vector. 9.3 Define unit vector 9.4 Explain scalar multiple of a vector 9.5 List the characteristics of parallel vectors 9.6 Identify quantities that may be classified as vector e.g. displacement velocity, acceleration, force etc. 9.7 Compute the modulus of any given vector up to 2 and 3 dimensions. 9.8 State the parallelogram law in solving problems including addition and subtraction of vectors 9.9 Apply the parallelogram law in solving problems including addition and subtraction of vectors. 9.10 Explain the concept of components of a vector and the meaning of orthogonal components. 9.11 Resolve a vector into its orthogonal components. 9.12 List characteristics of coplanar localized vectors. 9.13 Define the resultant or composition of coplanar vectors.	- Apply the techniques of vectors to solve various problems	-do-

COURSE: ALGEBRA AND ELEMENTARY TRIGONOMETRY		COURSE CODE: MTH 112	CONTACT HOURS: 15 HRS LECTURE 15 HRS TUTORIAL
Course Specification: Theoretical Content			
General Objectives 9.0: Understand the basic concepts and manipulation of vectors and their applications to the solutions of engineering problems			
Week	Specific Learning Outcomes	Teacher Activities	Resources
12	9.14 Compute the resultant of coplanar forces acting at a point using algebraic and graphical methods. 9.15 Apply the techniques of resolution and resultant to the solution of problems involving coplanar forces. 9.16 Apply vectoral techniques in solving problems involving relative velocity. 9.17 State the scalar product of two vectors. 9.18 Compute the scalar product of given vectors. 9.19 Define the cross product of the vector product of two vectors. 9.20 Calculate the direction ratios of given vectors. 9.21 Calculate the angle between two vectors using the scalar product.	- Apply the techniques of vector to solve various problems	-do-
General Objectives 10.0: Understand the Concept of equations and apply same to engineering problems			
Week	Specific Learning Outcomes	Teacher Activities	Resources
13 - 14	10.1 Explain the concept of equation, ie. $A = B$ where A and B are expressions. 10.2 List different types of equations:- Linear, quadratic, cubic, etc. 10.3 State examples of linear simultaneous equations with two unknowns and simultaneous equations with at least one quadratic equation. 10.4 Apply algebraic and graphical methods in solving two simultaneous equations involving a linear equation and a quadratic equation.	- Ask the student to solve various equations as indicated in section 10	-do-

COURSE: ALGEBRA AND ELEMENTARY TRIGONOMETRY		COURSE CODE: MTH 112	CONTACT HOURS: 15 HRS LECTURE 15 HRS TUTORIAL
Course Specification: Theoretical Content			
General Objectives 10.0: Understand the Concept of equations and apply same to engineering problems			
Week	Specific Learning Outcomes	Teacher Activities	Resources
13 - 14	10.5 Apply the algebraic and graphical methods in solving two simultaneous quadratic equations. 10.6 Define a determinant of n^{th} order. 10.7 Apply determinants of order 2 and 3 in solving simultaneous linear equations.	- Ask the student to solve various equations as indicated in section 10	-do-
General Objectives 11.0: Understand the definition, manipulation and application of trigonometric functions			
Week	Specific Learning Outcomes	Teacher Activities	Resources
15	11.1 Define the basic trigonometric ratios, sine, cosine and tangent of an angle. 11.2 Derive the other trigonometric ratios; cosecant, secant and cotangent using the basic trigonometric ratios in 11.1 above. 11.3 Derive identities involving the trigonometric ratios of the form; $\text{Cos}^2\theta + \text{Sin}^2\theta = 1$, $\text{Sec}^2\theta = 1 + \tan^2\theta$, etc. 11.4 Derive the compound angle formulae for $\sin(A+B)$, $\text{Cos}(A+B)$ and $\text{Tan}(A+B)$.	- Define and Derive the trigonometric ratios and identities	-do-
ASSESSMENT: The continuous assessment, tests and quizzes will be awarded 40% of the total score. The end of the Semester Examination will make up for the remaining 60% of the total score.			

Calculus

General Objectives

On completion of this course the student will be able to:

1. Understand the basic concepts of differential calculus and its application in solving engineering problems.
2. Know integration as the reverse of differentiation and its application to engineering problems.
3. Understand first order homogenous linear ordinary differential equation's with constant coefficients as applied to simple circuits.
4. Understand the basic concepts of partial differentiation and apply same to engineering problems.

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
COURSE: CALCULUS		Course Code: MTH 211	Contact Hours 3/0/0
Course Specification: Theoretical Content			
	General Objective: 1.0 Understand the basic concepts of differential Calculus and in application in solving engineering problems		
Week	Specific Learning Outcome	Teachers Activities	Resources
1 - 4	1.1 Define limits with examples 1.2 State and prove basic theorems on limits 1.3 Prove that $\lim \sin \theta/\theta$, $\lim \tan \theta/\theta = 1$ as $\theta \rightarrow 0$ 1.4 Define differentiation as an incremental notation or a function. 1.5 Differentiate a function from first principles. 1.6 Prove the formulae for derivative of functions, Function of a function, products, and quotient of functions. 1.7 Differentiate simple algebraic, trigonometric, logarithmic, exponential, hyperbolic parametric, inverse and implicit functions. 1.8 Derive second derivative of a function. 1.9 Apply differentiation to simple engineering and technological problems. 1.10 Explain the rate of change of a function 1.11 Explain the condition for turning point of a function.	- Teachers are to give and solve simple engineering and technological problems	Chalkboard, textbooks, lecture notes, chalk

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
COURSE: CALCULUS		Course Code: MTH 211	Contact Hours 3/0/0
Course Specification: Theoretical Content			
	General Objective: 1.0 Understand the basic concepts of differential Calculus and in application in solving engineering problems		
1 - 4	1.12 Distinguish between maximum and minimum value of a function. 1.13 Sketch the graph of a function showing its maximum and minimum points and points of inflexion. 1.14 Estimate error quantities from the small increment of a function. 1.15 Determine the tangent to a curve. 1.16 Determine the normal to a curve.	- Teachers are to give and solve simple engineering and technological problems	Chalkboard, textbooks, lecture notes, chalk
	General Objective 2.0: Know integration as the reverse of differentiation and its application to engineering problems		
Week	Specific Learning Outcome	Teachers Activities	Resources
5 - 8	2.1 Define integration as the reverse of differentiation. 2.2 Explain integration as a limit of summation of a function. 2.3 Distinguish between indefinite and definite integrals. 2.4 Determine the indefinite and definite integrals. 2.5 Determine the definite integral of a function. 2.6 Integrate algebraic, logarithmic, trigonometric and exponential simple functions. 2.7 List possible methods of integration. 2.8 Integrate algebraic and trigonometric functions by the substitution method 2.9 Integrate trigonometric and exponential functions by parts 2.10 Integrate algebraic functions by partial fraction. 2.11 Integrate trigonometric and logarithmic functions applying reduction formula.	Ask students to apply integral calculus to simple function	-do-

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
COURSE: CALCULUS		Course Code: MTH 211	Contact Hours 3/0/0
Course Specification: Theoretical Content			
	General Objective 2.0: Know integration as the reverse of differentiation and its application to engineering problems		
Week	Specific Learning Outcome	Teachers Activities	Resources
5 - 8	2.12 State standard forms of some basic integrals. 2.13 Calculate length of arc, area under a curve, area between two curves, volume of revolution, center of gravity, center of surface area, second moment and moment of inertia. 2.14 Define Trapezoidal and Simpson's rule as methods of approximating areas under given curves. 2.15 Find approximate area under a curve applying Trapezoidal method. 2.16 Find approximate area under a curve applying Simpson's rule. 2.17 Compare result obtained from Trapezoidal and Simpson's rules with the results by direct integration. 2.18 Apply integration to kinematics.	Ask students to apply integral calculus to simple function	-do-
	General Objective 3.0: Understand first order homogenous linear ordinary equations with constant coefficients as applied to simple engineering problems		
Week	Specific Learning Outcome	Teachers Activities	Resources
9 - 12	3.1 Define first order differential equation 3.2 List order, degree, general solution, boundary or initial conditions and particular solution of differential equations. 3.3 List examples of various types of first order differential equations. 3.4 Define first order homogenous differential equations 3.5 List the methods of solving differential equations by separable variables. 3.6 Identify differential equations reducible to the homogenous form.	Ask students to apply differential equation to solve engineering problems	-do-

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
COURSE: CALCULUS		Course Code: MTH 211	Contact Hours 3/0/0
Course Specification: Theoretical Content			
General Objective 3.0: Understand first order homogenous linear ordinary equations with constant coefficients as applied to simple engineering problems			
Week	Specific Learning Outcome	Teachers Activities	Resources
9 - 12	3.7 Explain exact differential equations. 3.8 Solve exact differential equations, e.g. Show that $(3x^2 + y \cos x) dx + (\sin x - 4y^3) dy = 0$ is an exact differential equation; Find its general solution. 3.9 Define integrating factors. 3.10 Determine the solution of differential equations using integrating factors. 3.11 Define linear differential equations of the first order.	Ask students to apply differential equation to solve engineering problems	-do-
General Objective 4.0: Understand the basic concepts of partial differentiation and apply same to engineering problems			
Week	Specific Learning Outcome	Teachers Activities	Resources
13 - 15	4.1 Define partial differentiation 4.2 List and explain the uses of partial derivatives. 4.3 Solve problems on partial differentiation. e.g. $f(x, y) = x^2 + y^2 = 2xy$, find dy/dx , dx/dy 4.4 Apply partial differentiation to engineering problems.	- Solve problems on partial differential	-do-
Assessment: The continuous assessment, test and quizzes will be awarded 40% of the total score. The end of the semester Examination will make up for the remaining 60% of the score			

Logic and Linear Algebra

Logic and Linear Algebra MTH 202

General Objectives

On completion of this course the student will be able to:

1. Understand the basic rules of mathematical logic and their application to mathematical proofs.
2. Know permutations and combinations
3. Compute the binomial expansion of algebraic expansions.
4. Understand the algebraic operations of matrices and determinants as well as solve simultaneous linear equations by the methods of matrices.

**COURSE: LOGIC AND LINEAR ALGEBRA COURSE CODE: MTH 202 CONTACT HOURS: 15HRS
LECTURE 15 HRS TUTORIAL**

Course Specification: Theoretical Content

General Objective 1.0: On completion of this course, the students should be able to:

Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 2	<p>1.1 The essential connectives, negation, conjunction, disjunction, implication and bi-implication</p> <p>1.2 State the essential connectives defined in 1.1 above.</p> <p>1.3 Explain grouping and parenthesis in logic,</p> <p>1.4 Explain Truth Tables.</p> <p>1.5 Define tautology</p> <p>1.6 Give examples of types of tautology. e.g</p> <p style="padding-left: 40px;">If P and Q are distinct atomic sentences, which of the following are tautologies?</p> <p style="padding-left: 40px;">P B Q (b) P U Q B Q U P (c) P V (P * Q)</p> <p>Let P = Jane Austen was a contemporary of Beethoven.</p> <p>Q = Beethoven was a contemporary of Gauss.</p> <p>R = Gauss was a contemporary of Napoleon</p> <p>S \Rightarrow Napoleon was a contemporary of Julius Caesar. (Thus P, Q and R are true, and S is false).</p> <p>Then find the truth values of sentences:-</p> <p style="padding-left: 40px;">(a) $(P * Q) = R$</p> <p style="padding-left: 40px;">(b) $(P B Q)$</p> <p style="padding-left: 40px;">(c) $P * Q B R B$</p> <p style="padding-left: 40px;">S</p>	<p>- Explain and illustrate 1.1 to 1.6 and ask the students to find the truth value of the logic statement</p> <p>- Assess the student</p>	<p>- Lecture notes, Recommended textbooks, charts, chalkboard</p>

**COURSE: LOGIC AND LINEAR ALGEBRA COURSE CODE: MTH 202 CONTACT HOURS: 15HRS
LECTURE 15 HRS TUTORIAL**

Course Specification: Theoretical Content

General Objective 1.0: On completion of this course, the students should be able to:

Week	Specific Learning Outcome:	Teachers Activities	Resources
3 - 4	1.7 Define universal quantifier and existential quantifier. 1.8 Translate sentences into symbolic form using quantifiers. e.g. > some freshmen are intelligent = can be stated as for some x, x, is a freshman and x is intelligent = can translate in symbols as ($\exists x$) (Fx & Ix). 1.9 Define the scope of a quantifier 1.10 Define > bound = and > free = variables 1.11 Define > term = and formula = 1.12 Give simple examples of each of 1.9 to 1.11 above. 1.13 Explain the validity of formulae	- Explain and illustrate 1.7 to 1.2 and asked the students to solve problems on 1.7 to 1.11	- Recommended textbooks, lecture notes, chalkboard, chalk

General Objective 2.0: Know permutation and combination

Week	Specific Learning Outcome:	Teachers Activities	Resources
5 - 7	2.1 Define permutations and combinations 2.2 Give illustrative examples of each of 2.1 above 2.3 State and approve the fundamental principle of permutation. 2.4 Give illustrative examples of the fundamental principles of permutation. 2.5 Establish the formula ${}^n P_r = n! / (n - r)!$ 2.6 Prove that ${}^n P_r = (n - r + 1) \times {}^n P_{(r - 1)}$. 2.7 Solve problems of permutations with restrictions on some of the objects. 2.8 Solve problems of permutations in which the objects may be repeated. 2.9 Describe circular permutations. 2.10 Solve problems of permutation of N things not all different. 2.11 Establish the formula ${}^n C_r = n! / [(n - r)! r!]$ 2.12 Solve example 2.11 2.13 State and prove the theorem ${}^n C_r = {}^n C_{n-r}$.	- Explain and illustrate the activities in 2.1 to 2.15 and ask the student to: - establish the formula ${}^n P_r = n! / (n - r)!$ - Prove that ${}^n P_r = (n - r + 1)({}^n P_{(r - 1)})$ - Establish the formula ${}^n C_r = n! / [(n - r)! r!]$ - Prove that ${}^n C_r = {}^n C_{n-r}$	- Recommended textbooks, lecture notes, chalkboard, chalk

**COURSE: LOGIC AND LINEAR ALGEBRA COURSE CODE: MTH 202 CONTACT HOURS: 15HRS
LECTURE 15 HRS TUTORIAL**

Course Specification: Theoretical Content

General Objective 2.0: Know permutation and combination

Week	Specific Learning Outcome:	Teachers Activities	Resources
5 - 7	2.14 Solve problems of combinations with restrictions on some of the objects. 2.15 Solve problems of combinations of n different things taken any number at a time.		

General Objective 3.0: Know binomial theorem

Week	Specific Learning Outcome:	Teachers Activities	Resources
8 - 10	3.1 Explain with illustrative examples B the method of mathematical induction. 3.2 State and prove binomial theorem for positive integral index. 3.3 Explain the properties of binomial expansion. 3.4 State at least seven (7) examples of 3.3 above. e.g. i. A $(x^2 - 1/x)$ ii. Find the constant term in the expansion of $(x + 1/x)^A$ iii. Find the co-efficient of x^v in the expansion of $(x \pm k)^A$ where v is a number lying between Bn and n- 3.5 State the binomial theorem for a rational number 3.6 State the properties of binomial coefficients. 3.7 Apply binomial expansion in approximations (simple examples only).	- Explain and illustrate activities in 3.1 to 3.7 and ask the students to solve them	- Recommended textbooks, lecture notes, chalkboard, chalk, etc

**COURSE: LOGIC AND LINEAR ALGEBRA COURSE CODE: MTH 202 CONTACT HOURS: 15HRS
LECTURE 15 HRS TUTORIAL**

Course Specification: Theoretical Content

General Objective 4.0: Know matrices and determinants

Week	Specific Learning Outcome:	Teachers Activities	Resources
11 - 15	<p>4.1 Define Matrix</p> <p>4.2 Define the special matrices B zero matrix, identify matrix B square matrix, triangular matrix, symmetric matrix, skero symmetric matrix.</p> <p>4.3 State example for each of the matrices in 4-2 above.</p> <p>4.4 State the laws of addition and multiplication of matrices.</p> <p>4.5 Illustrate the commutative, associative, and distributive nature of the laws states in 4.4 above.</p> <p>4.6 Explain the transpose of a matrix.</p> <p>4.7 Determine a determinant for $2by^2$ and $3by^2$ matrices.</p> <p>4.8 Define the minors and cofactors of a determinant.</p> <p>4.9 Explain the method of evaluating determinants.</p> <p>4.10 State and prove the theorem A Two rows or two columns of a matrix are identical, then the value of it's determinant is zero.</p> <p>4.11 State and prove the theorem A If two rows or two columns of a matrix are interchanged, the sign of the value of its determinant is changed.</p> <p>4.12 State and prove the theorem A If any one row or one column of a matrix is multiplied by a constant, the determinant itself is multiplied by the constant.</p> <p>4.13 State and prove the theorem A If a constant times the elements of a row or a column are added to the corresponding elements of any other row or column, the value of the determinant itself is multiplied by the constant.</p>	<p>- Explain and illustrate the activities in 4.1 to 4.19. Ask the student to prove the theorems and solve problems on the illustrated activities. Assess the students</p>	<p>- Recommended textbooks, lecture notes, chalkboard, chalk, etc</p>

**COURSE: LOGIC AND LINEAR ALGEBRA COURSE CODE: MTH 202 CONTACT HOURS: 15HRS
LECTURE 15 HRS TUTORIAL**

Course Specification: Theoretical Content

11 - 15	<p>4.14 State five examples of each of the theorems in 4.10-4.13 above.</p> <p>4.15 Define the adjoint of a matrix</p> <p>4.16 Explain the inverse of a matrix.</p> <p>4.17 State the linear transformations on the rows and columns of a matrix.</p> <p>4.18 Apply Cramer's rule in solving simultaneous linear equation.</p> <p>4.19 Apply Linear transformation in solving simultaneous linear equations.</p>	<p>- Explain and illustrate the activities in 4.1 to 4.19. Ask the student to prove the theorems and solve problems on the illustrated activities. Assess the students</p>	<p>- Recommended textbooks, lecture notes, chalkboard, chalk, etc</p>
	<p>Assessment: The continuous assessment, tests and quizzes will be awarded 40% of the total score. The end of the Semester Examination will make up for the remaining 60% of the total score</p>		

Introduction to Statistics

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
COURSE: INTRODUCTION TO STATISTICS		COURSE CODE: STA 111	CONTACT HOURS: 1- 1-0
Course Specification: Theoretical Contents			
General Objectives 1.0: Understand statistics and all that it stands for.			
Week	Special Learning Outcomes	Teachers Activities	Resources
1	1.1 Define statistics 1.2 Explain with approximate illustrations, the use of statistics in Government, Biological Sciences, Physical Science. Business and Economics.	Lecture Give students assignments	Chalkboard, chalk, duster, calculators. Recommended text books
General Objective 2.0: Understand the different methods of data collection and their limitations.			
Week	Specific Learning Outcomes	Teachers Activities	Resources
2-3	2.1 State the method of collecting data 2.2 Describe the two main methods of collecting primary data: a) Established published sources b) "Ad-hoc" basic or experimentation 2.3 State the merits and demerits of the methods of collecting primary data 2.4 Explain the concept of data "editing" and its application in editing primary and secondary data. 2.5 Describe the sources of error in data collection	- do -	- do -
General Objectives 3.0: Know the different forms of data presentation			
Week	Specific Learning Outcomes	Teachers Activities	Resources
4-5	3.1 Explain the objectives of classification of a mass of raw data 3.2 Prepare a frequency distribution form a given data 3.3 Explain the usefulness of diagrams in presenting statistical data 3.4 Construct bar chart, pie chart, histogram, frequency polygon and cumulative frequency polygon knave for a given set of data 3.5 Outline the merits and demerits of each diagram in 3.4 above.	Lecture Give sample charts Give students assignments	- do -

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
COURSE: INTRODUCTION TO STATISTICS		COURSE CODE: STA 111	CONTACT HOURS: 1- 1-0
General Objective 4.0 Understand the use and the importance of some measures of central tendency in summarizing data.			
Week	Specific Learning Outcomes	Teachers Activities	Resources
6-7	4.1 Define Arithmetic mean, Geometric Mean, Median, Mode and harmonic mean 4.2 Compute the measurer in 4.1 above given: i. ungrouped ii. grouped data 4.3 Explain the uses of Geometric and Germanic means 4.4 Calculate: Quantiles Deciles Percentiles given a set of data 4.6 List the merits and demerits of all the above measured of central tendency.	Lecture Give students assignments	- do -
General Objective 5.0: Understand the use and importance of measures of dispersion in summarizing data			
Week	Specific Learning Outcomes	Teachers Activities	Resources
8	5.1 State the importance of measures of dispersion 5.2 Defined and calculate the mean deviation Semi interquartile range Variance and standard 5.3 Describe the application of the measures of dispersion defined in 5.2 above. 5.4 Calculate these standard error of the sample mean for given data	- do -	- do -
General Objective: 6.0 Know the different types of random variables			
Week	Specific Learning Outcomes	Teachers Activities	Resources
9	6.1 Define a random variable 6.2 Explain the concept of randomness 6.3 Define discrete and continuous variables 6.4 State examples of discrete and continuous variables	- do -	- do -

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
COURSE: INTRODUCTION TO STATISTICS		COURSE CODE: STA 111	CONTACT HOURS: 1- 1-0
General Objective 7.0: Understand the basic principles of probability			
Week	Specific Learning Outcomes	Teachers Activities	Resources
10	7.1 Define probability 7.2 Explain probability using the relative frequency approach 7.3 State the laws of probability 7.4 Solve simple problems by applying the laws of probability 7.5 Define conditional probability for two events.	- do -	- do -
General Objectives 8.0: Understand some basic probability distributions and be able to identify each distribution			
Week	Specific Learning Outcomes	Teachers Activities	Resources
11-13	8.1 State the probability distribution of a random variable 8.2 Define mathematical expectation of discrete and continuous random variable 8.3 Define expectations of functions of discrete random variable 8.4 Define the binomial distribution 8.5 Define conditional probability for two events 8.6 Calculate the means and variance under the Binomial and the poison distributions 8.7 Define Normal distribution 8.8 Approximate probabilities for given continuous random variables using normal distribution 8.9 Explain the characteristics of Binomial distribution 8.10 Apply Binomial distribution of samples with replacement 8.11 Solve given problems applying binomial distribution 8.12 Describe normal distribution curve and the empirical distribution rule 8.13 Explain the characteristics of Normal distribution Calculate the probability given the deviation from the mean	- do -	- do -

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
COURSE: INTRODUCTION TO STATISTICS		COURSE CODE: STA 111	CONTACT HOURS: 1- 1-0
	General Objectives 8.0: Understand some basic probability distributions and be able to identify each distribution		
Week	Specific Learning Outcomes	Teachers Activities	Resources
11-13	8.14 Calculate the deviation given the means, standard deviation and a particular observation 8.15 Calculate the area under the curve at different point from either side of the mean. 8.16 Apply Normal distribution curve to simple problems	- do -	- do -
	General Objectives 9.0: Understand the principles of correlation of two variables and the regression of one variable on an.		
Week	Specific Learning Outcomes	Teachers Activities	Resources
14 - 15	9.1 Define correlation 9.2 State the types of correlation 9.3 Describe the methods of studying correlation i. Scatter diagram (graphic method) ii. Kari Pearson's coefficient of correlation iii. Spearman's rank correlation 9.4 Calculate Pearson's and Spearman's correlation coefficients 9.5 Define regression equation of the form $Y=a+bx$ using free-hand method and Method of least squares.	Lecture Give sample Charts Give students assignments	- do -
	ASSESSMENT: Course Work 20%, Course Test 20%, Practical 0%, Examination 60% COMPETENCY: The Student should be able to apply basic statistical methods in the construction industry.		

Business Courses

Business Entrepreneurship

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: Entrepreneurship Development I		Course Code: SDV 210	Contact Hours: 2 - 0 - 0
Course Specification: Theoretical Content		Specification Theoretical Content	
General Objective 1.0: Understand the basic concept of entrepreneurship			
Week	Special Learning Objectives	Teachers Activities	Resources
1	1.1 Define entrepreneurship, entrepreneur, small business and self-employment. 1.2 State the entrepreneurship philosophy and identify entrepreneurial characteristics. 1.3 Identify entrepreneurial characteristics. 1.4 Define development enterprise.	- Lecture and site examples of each.	Chalkboard
General Objective 2.0: Understand the historical perspective of entrepreneurship development			
Week	Special Learning Objectives	Teachers Activities	Resources
2	2.1 Historical perspective. 2.2 Trace the origin of entrepreneurship. 2.3 Explain organizational structure. 2.4 Explain the role of an entrepreneur. 2.5 Explain the reasons for business failure.	- Trace the historical evolution of business enterprise citing example Highlight the reasons for their failure/success.	Chalkboard
General Objective 3.0: Know how to plan a business enterprise/project.			
Week	Special Learning Objectives	Teachers Activities	Resources
3	3.1 Define the concepts: planning, business enterprise and project. 3.2 Explain the importance of planning to a business enterprise. 3.3 Analyse the skills and Techniques of starting and managing small business successfully.	- Lecture and illustrate with examples. - Highlight to the students the initial problems likely to be faced. - Invite a successful entrepreneur to deliver lecture to the students.	Chalkboard

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: Entrepreneurship Development I		Course Code: SDV 210	Contact Hours: 2 - 0 - 0
Course Specification: Theoretical Content		Specification Theoretical Content	
4 - 5	3.4 Prepare and present project proposal. 3.5 Manage a small business profitably.	- Lecture and introduce the students to the formats of various project proposals.	Chalkboard
General Objective 4.0: Know how to operate simple stock keeping records			
Week	Special Learning Objectives	Teachers Activities	Resources
6	4.1 Ordering spare parts/materials 4.2 Receipt of parts/materials 4.3 Storage of parts/materials 4.4 Issue of parts/materials	Lecture and demonstrate to students how to write receipt and keep records of ordering, storage and issue materials.	Store or any storage facility Record notebooks.
General Objective 5.0: Know how to prepare and operate cash flow on spreadsheets			
Week	Special Learning Objectives	Teachers Activities	Resources
7 - 8	5.1 Need for different records (capital, revenue, credit transaction, tax) 5.2 Formatting spreadsheet 5.3 Operating spreadsheet	- Lecture and demonstrate for the students to appreciate - Give practical exercise to students.	Chalkboard and Computer
General Objective 6.0: Understand employment issues			
Week	Special Learning Objectives	Teachers Activities	Resources
9	6.1 Define the terms: education, training and development. 6.2 Relate education, training and development to employment. 6.3 Distinguish between skills and employment. 6.4 Explain the role of the private sector in employment generation. 6.5 Identify the forms and informal sectors. 6.6 Explain the issues of: (i) Rural youth and employment (ii) Urban youth and employment.	- Lecture and cite examples.	Chalkboard.

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: Entrepreneurship Development I		Course Code: SDV 210	Contact Hours: 2 - 0 - 0
Course Specification: Theoretical Content		Specification Theoretical Content	
General Objective 7.0: Understand the Nigerian Legal System			
Week	Special Learning Objectives	Teachers Activities	Resources
10	7.1 Explain the nature of law. 7.2 Analyse the sources of Nigerian laws. 7.3 Evaluate the characteristics of Nigerian Legal System.	- Lecture	Chalkboard
General Objective 8.0: Comprehend the nature of contract and tort			
Week	Special Learning Objectives	Teachers Activities	Resources
11	8.1 Define contract. 8.2 Explain types of contracts 8.3 State the basic requirements for a valid contract. 8.4 Analyse contractual terms.	- Lecture	Chalkboard
12	8.5 Examine vitiating terms. 8.6 Explain breach of contract and remedies. 8.7 Define Tort. 8.8 Explain types of Tort. 8.9 Discuss tortuous liabilities and remedies.	- Lecture	Chalkboard
General Objective 9.0: Understand Agency and Partnership			
Week	Special Learning Objectives	Teachers Activities	Resources
13-14	9.1 Define agency 9.2 Explain creation of agency 9.3 Explain authority of the agent. 9.4 Analyse the rights and duties of principal agent and third parties. 9.5 Explain termination of agency and remedies.	- Lecture	Chalkboard

PROGRAMME: NATIONAL DIPLOMA IN QUANTITY SURVEYING			
Course: Entrepreneurship Development I		Course Code: SDV 210	Contact Hours: 2 - 0 - 0
Course Specification: Theoretical Content		Specification Theoretical Content	
General Objective 9.0: Understand Agency and Partnership			
Week	Special Learning Objectives	Teachers Activities	Resources
15	9.6 Define partnership. 9.7 Examine creation of partnership. 9.8 Explain relations of partners to one another and to persons dealing with them. 9.9 Analyse dissolution of partnership and remedies	- Lecture and cite examples	Chalkboard
<p>Assessment: Coursework 20% Course tests 20% Practical 0% Examination 60%.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Wole Adewumi, A Business Management An Introduction, McMillan Nig. Ltd. Lagos. 1988. 2. Soji Olokoyo, A small Business Management Guide Entrepreneurs, Ola Jamon Printers and Publishers, Kaduna. 			

Architectural Courses

Basic Principles of Architectural Design and Drawing

Course: Basic Principles of Architectural Design & Drawing		Course Code: QUS 213	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective: 1.0 Know the Principles in perspective drawing			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1	1.1 Explain the basic theory of perspective drawing. 1.2 Describe picture plane and its importance to perspective drawing. 1.3 Explain the relationship between object plan, picture plane, station point, vanishing point and eye level. 1.4 Construct ground/line, eye level and true height line in perspective. 1.5 Draw the perspective of simple rectangular objects. 1.6 Differentiate between the three types of perspective drawing: a. one point perspective b. two point perspective c. three point perspective	<ul style="list-style-type: none"> • Explain the basic principle in perspective drawing. • Use such explanations to draw/construct various perspective shapes. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, protractor, square, pair of compasses, ruler.
2	1.7 Produce a one-point perspective of a rectangular prism. 1.8 Draw a circle in perspective using: a. octagonal method b. tangent square method 1.9 Draw simple objects involving straight and curved lines in: a. one-point perspective b. two-point perspective c. three-point perspective	- do -	- do -

Course: Basic Principles of Architectural Design & Drawing		Course Code: QUS 213	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 2.0: Know how to trace drawings			
Week	Special Learning Objectives	Teachers Activities	Resources
3 - 4	<p>2.1 Explain the principles and procedures in tracing.</p> <p>2.2 Choose pens and pen points for tracing a given set of working drawings.</p> <p>2.3 Trace in ink a given set of working drawing.</p> <p>2.4 Stencil the traced set of drawings.</p>	<ul style="list-style-type: none"> • Demonstrate how to hold various tracing pens. • Demonstrate how to maintain various tracing pens. • Demonstrate how to trace a given drawing. • Demonstrate how to stencil a traced drawing. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, drawing pens, drawing ink, various stencil sizes.
General Objective 3.0: Understand the principle of anthropometrics			
Week	Special Learning Objectives	Teachers Activities	Resources
5	<p>3.1 Define anthropometrics.</p> <p>3.2 Explain the principle of anthropometrics.</p> <p>3.3 Derive anthropometrics data for various human functions.</p> <p>3.4 Derive the space requirement for various types of furniture, fixtures, circulation space, etc.</p> <p>3.5 Arrange furniture, fixtures and equipment of common usage in a given residential design.</p>	<ul style="list-style-type: none"> • Explain the principles of proportioning. • Relate this principle with respect to human perspective in space arrangement. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.

Course: Basic Principles of Architectural Design & Drawing		Course Code: QUS 213	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 4.0: Know the elements in Design			
Week	Special Learning Objectives	Teachers Activities	Resources
6	<p>4.1 Explain the composition of forms in relation to rhythm, balance and texture.</p> <p>4.2 Explain proportion in relation to anthropometrics principles as a design element</p> <p>4.3 Explain the structure of light particularly in relation to colour and contrast</p> <p>4.4 Describe the principle of visible colour of an object in relation to the reflection, refraction and absorption properties of light</p> <p>4.5 Identify the various colours available</p>	<ul style="list-style-type: none"> • Explain forms, rhythm, balance, texture. • Relate this to principle of proportioning in design criteria. • Give examples of light, colour, shade and contrast. • Show how these are related in design. • Show various types of scale rule available. • Interpret them with respect to available dimensions. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, various scale rules.
7	<p>4.6 Construct the colour wheel.</p> <p>4.7 Illustrate the principle of contrast and harmony in the use of colours.</p> <p>4.8 Explain the importance of colours and their symbolism in design.</p> <p>4.9 Explain the importance of scale and dimension as design elements.</p>		
General Objective 5.0: Appreciate the Design Process			
Week	Special Learning Objectives	Teachers Activities	Resources
8 - 11	<p>5.1 Identify the functional spaces in any of the following building types: snack-bar, kiosk, convenience shops, bus stop shelter, 2bedroom bungalow, etc.</p> <p>5.2 Work out the space requirement for the various functional spaces in the chosen building type.</p> <p>5.3 Enumerate the sequence of events in the chosen building type.</p>	<ul style="list-style-type: none"> • Identify various functional spaces. • Show how to calculate the various functional spaces. • Explain the use of bubble diagram in design. • Produce complete design. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculators.

Course: Basic Principles of Architectural Design & Drawing		Course Code: QUS 213	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 5.0: Appreciate the Design Process			
Week	Special Learning Objectives	Teachers Activities	Resources
8 – 11	5.4 Draw a bubble diagram showing the inter-relationship of the different spaces. 5.5 Prepare an outline sketch of the spaces. 5.6 Determine the form of the outline sketch produced. 5.7 Produce the plan and elevations for the outline sketch.		
General Objective 6.0: Know how to code and reproduce drawings			
Week	Special Learning Objectives	Teachers Activities	Resources
12 - 15	6.1 Explain the various systems of coding drawings. 6.2 Illustrate how to lay out drawings. 6.3 Present drawings. 6.4 Enumerate the various equipment used in graphical reproduction, e.g. printing machine, scanning machine, photocopying machine etc. 6.5 Maintain the equipment in 6.4 above.	<ul style="list-style-type: none"> • Explain why drawings are coded. • Explain the various systems of coding drawings. • Show how to present drawings. • Identify various equipment used in reproducing drawings. • Demonstrate the use of these equipment 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, printing machine, photocopying machine, scanning machine, computers, appropriate soft wares.
<p>Assessment: Course work - 10%, Course Test - 10%; Practical - 40%; Examination - 40%</p> <p>Competency: on completing, the student should be able to reproduce drawings</p> <p>References: Praser Reekie, "Draughtmanship"; Robert C.M.C. "Working drawing Handbook"</p>			

Course: Basic Principles of Architectural Design & Drawing		Course Code: QUS 213	Contact Hours: 1-0-2
Course Specification: Practical Content			
General Objective 1.0: Know the Basic Principles of Perspective, Tracing and Designing elements in drawing			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1 - 6	<p>a. Describe picture plane and its importance to perspective drawing.</p> <p>b. Construct ground/line, eye level and true height line in perspective..</p> <p>c. Draw the perspective of simple rectangular objects.</p> <p>d. Draw the three types of perspective.</p> <p>e. Produce a one-point perspective of a rectangular prism.</p> <p>f. Draw a circle in perspective using octagonal and tangent square methods.</p> <p>g. Draw simple objects involving straight and curved lines in the three types of perspective.</p>	<ul style="list-style-type: none"> • Draw sample and direct the student to produce various perspective shapes. • Produce various perspective shapes. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, protractor, square, pair of compasses, ruler.
7 - 12	<p>h. Trace in ink a given set of working drawing.</p> <p>i. Stencil the traced set of drawings.</p> <p>j. Describe the principle of visible colour of an object in relation to the reflection, refraction and absorption properties of light.</p> <p>k. Show the various colours available.</p>	<ul style="list-style-type: none"> • Direct and supervise student to trace and stencil sample drawing. • Demonstrate general elements of design to students. 	Ditto

Building Courses

Principles of Construction Economics I

Course: Principles of Construction Economics I		Course Code: QUS 207	Contact Hours: 1 - 1 - 0
Course Specification: Theoretical Content			
General Objective: 1.0 Understand the nature and scope of construction industry			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1	1.1 Explain the nature of construction industry, emphasizing on its scope of activities. 1.2 Mention some characteristics of its product, such as buildings, bridges, etc,	<ul style="list-style-type: none"> Define the construction industry in relation to its framework i.e. civil, building etc. Itemize the main product assembled by the industry. 	<ul style="list-style-type: none"> Chalkboard, chalk, duster.
General Objective 2.0: Understand the principles of approximate estimating and various methods and uses of approximate estimates.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
2 - 4	2.1 Explain the purpose and forms of approximate estimating techniques. 2.2 Describe the various approximate estimating techniques: <ol style="list-style-type: none"> Unit method Cubic method Superficial or floor area method Storey enclosure method Approximate quantities 2.3 Explain the situation and occasions where each of the methods can be used.	<ul style="list-style-type: none"> Define the technical terms Use worked examples to further your illustration. 	Ditto

Course: Principles of Construction Economics I		Course Code: QUS 207	Contact Hours: 1 - 1 - 0
Course Specification: Theoretical Content			
General Objective 3.0: Understand cost implications of design variable			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5 - 8	3.1 Define design variables. 3.2 Explain the concept of cost as related to the construction industry. 3.3 Explain the effect of the following design variable on cost of construction: (a) Plan shape, (b) size of project (c) perimeter/ floor area ratios (d) storey height (e) total height of building.	<ul style="list-style-type: none"> • Define cost as related to construction industry. • Use extensive worked examples. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculator.
General Objective 4.0: Understand the other factors affecting development			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9-10	4.1 Explain the effect of legislation on project cost: a. population density (in case of estate) b. special installation requirement such as lifts, fire fighting equipment, fire and burglary alarm. 4.2 Explain the effect of site condition on project cost. 4.3 Explain the effect of use of plant and market conditions on construction cost.	<ul style="list-style-type: none"> • Discuss the influence of indirect cost on project cost. • Cite numerous examples. • Highlight the need to economize space, etc. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.
General Objective 5.0: Understand cost implication of constructional methods.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
11-15	5.1 Explain various constructional methods. 5.2 Discuss the effect of this on construction cost.	<ul style="list-style-type: none"> • Discuss the adaptability of each and state their merits and demerits. • Cite relevant practical examples. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.

Course: Principles of Construction Economics I	Course Code: QUS 207	Contact Hours: 1 - 1 - 0
Course Specification: Theoretical Content		
	<p>Assessment: Course work - 20%; Course Test - 20%; Practical - 0%; Examination 60%</p> <p>Competency: On completing, the student should be able to appreciate the economic problems and cost control in the building industry.</p> <p>References: (1) Bathurs, P.E., "Building cost control techniques and economics" (2) Carryclidge, D.P. "Cost planning and building economics"</p>	

Principles of Construction Economics II

Course: Principles of Construction Economics II		Course Code: QUS 208	Contact Hours: 2-0-0
Course Specification: Theoretical Content			
General Objective: 1.0 Understand the basic principles of cost control of construction project			
Week	Specific Learning Outcome	Teachers Activities	Resources
1 - 2	1.1 Define cost control. 1.2 Explain historical development of cost control process. 1.3 Explain the need for cost control. 1.4 State the main aims of cost control.	<ul style="list-style-type: none"> • Use relevant examples to explain all the related terms. • Give assignment to students. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster
General Objective 2.0: Understand need for role of the QS during the design stage.			
Week	Specific Learning Outcome	Teachers Activities	Resources
3 - 6	2.1 Explain the role of the QS during the design stage of project. 2.2 Explain initial estimate as the first step in cost control. 2.3 Explain cost control during execution of project. 2.4 Use RIBA design terminology to explain various stages of construction project which must be controlled.	<ul style="list-style-type: none"> • Explain using relevant examples. • Use question and answer techniques to ascertain level of understanding. • Use relevant examples to explain. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, RIBA plan of work • Chalkboard, chalk, duster.
General Objective 3.0: Understand nature of cost and cost-in-use as applied to construction projects.			
Week	Specific Learning Outcome	Teachers Activities	Resources
7 - 15	3.1 Explain concept of cost-in-use. 3.2 Mention and explain cost in-use terminology. 3.3 Explain the following: <ul style="list-style-type: none"> a. Initial cost b. Running cost c. Maintenance cost d. Replacement cost 3.4 Define and explain: <ul style="list-style-type: none"> a. Fixed cost b. Variable cost c. Full cost d. Marginal cost 	<ul style="list-style-type: none"> • Explain using relevant examples. • Give live examples of cost-in-use. • Give assignments. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.

Course: Principles of Construction Economics II	Course Code: QUS 208	Contact Hours: 2-0-0
Course Specification: Theoretical Content		
	<p>Assessment: Course work - 20; Course Test - 20%; Practical - 0%; Examination - 60%</p> <p>Competency: On completion, the student should be able to use cost control principle in building industry.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Ivor H. Seeley "Building Economics" 4th Edition 2. Stephen L.G. "Construction Economics" (An Introduction) Macmillan 	

Wood Workshop Practice

Course: Wood Workshop Practice		Course Code: QUS 105	Contact Hours: 1-0-3
Course Specification: Theoretical Content			
General Objective: 1.0 Know woodworking tools and equipment.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1 - 2	1.1 Use the cramps and shooting board. 1.2 Use geometrical tools such as marking gauges, tapes, pencil caliper, wing compasses, the tee-square and sliding level. 1.3 Use cutting tools such as saws, chisels and planes. 1.4 Illustrate the differences between fixing tools such as Hammer, mallets, nail punches and screw drivers and the Ratchet brace.	<ul style="list-style-type: none"> • All these tools and equipment should be shown to all the students. • Examples of how they should be used to do the work should be done for the students. • Students should be ensured that they are doing it. 	<ul style="list-style-type: none"> • Chalkboard, chalks, marking gauges, tapes, pencil, caliper, compasses, saws, chisels, hammer, mallets, nail punchet, screw driver, Ratchet Brace, • Planes, tee-square, sliding level.
General Objective 2.0: Understand factory acts and safety regulations applicable in the wood workshop.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
3 - 4	2.1 Propose adequate ventilation for the workshop. 2.2 Create storage facility for tools and first aid equipment. 2.3 Demonstrate general safety habits with respect to both electrical and machinery. 2.5 Illustrate the layout of an ideal wood workshop.	<ul style="list-style-type: none"> • Factory act to be read and explained to the students. 	<ul style="list-style-type: none"> • A copy of the factory act should be bought.
General Objective 3.0: Know the types and characteristics of timber used for various work purposes.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
5 - 7	3.1 Illustrate the growth, structure and shrinkage of timber. 3.2 Differentiate hardwood from softwood. 3.3 Describe suitable timber conversion methods such as slab saw, tangential sawing and quarter sawing.	<ul style="list-style-type: none"> • Illustrate with diagrams. 	<ul style="list-style-type: none"> • Chalkboard, chalk, Duster, Charts.

Course: Wood Workshop Practice		Course Code: QUS 105	Contact Hours: 1-0-3
Course Specification: Theoretical Content			
5 - 7	<p>3.4 Explain seasoning methods of timber such as natural (air seasoning), kiln seasoning - compartment kilns, progressive kilns, combined air and kilns method, chemical seasoning etc.</p> <p>3.5 Describe timber preservation methods:</p> <ol style="list-style-type: none"> Wood preservative oil method Waterborne preservative method Other preservation methods like pressure process, open tank (hot and bath process), and brush, dip stray applications <p>3.6 Analyze diffusion process, identifying the various types and sizes of timber available for use in the market.</p>	<ul style="list-style-type: none"> Illustrate with diagrams. 	<ul style="list-style-type: none"> Chalkboard, chalk, Duster, Charts.
General Objective 4.0: Know the different types of jointing materials			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
8 - 9	<p>4.1 Use nails of different sizes on given job types.</p> <p>4.2 Use various types of screws such as raised head, round head, counter sunk head and coach or square head on given job types.</p> <p>4.3 Use other materials such as bolts and nuts, timber connectors, etc.</p> <p>4.4 Classify wood adhesive, e.g. thermosetting and thermoplastic.</p> <p>4.5 Explain the properties of animal and synthetic resin adhesives and their advantages. Example. Epoxyresin, polyvinyl acetate (P.V.A) and rubber based adhesives.</p>	<ul style="list-style-type: none"> Demonstrate with real objects. 	<ul style="list-style-type: none"> Real objects like, Screws, nuts etc Chalkboard, chalk.

Course: Wood Workshop Practice		Course Code: QUS 105	Contact Hours: 1-0-3
Course Specification: Theoretical Content			
General Objective 5.0: Know the various types of wood joints			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
9-11	<p>5.1 Construct widening joints, and tongue and groove joints.</p> <p>5.2 Construct the following joints:</p> <ul style="list-style-type: none"> a. Frame joint. b. Tee and cross halving joint. c. Common mortise and tenon, and haunched tenon joint. d. Long and short shouldering mortise and tenon with rebate. <p>5.3 Construct angle joints such as dovetail joint, housing joint and dowel joint.</p>	<p>Demonstrate clearly to students;</p> <p>Give more practical assignment to students.</p>	ditto
General Objective 6.0: Know the various Woodworking machine in use.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
12-15	<p>6.1 Classify woodworking machines such as</p> <ul style="list-style-type: none"> a. Planning machine b. Sawing machine c. Band saw machine d. Spindle moulding machine e. Drilling machine f. mortiser and tenoning machine g. Sanding and portable hand machines <p>6.2 Use the machines in 6.1 above.</p> <p>6.3 Maintain the machines listed in 6.1 above.</p>	<p>Expose the students to all the machines.</p>	ditto

Course: Wood Workshop Practice	Course Code: QUS 105	Contact Hours: 1-0-3
Course Specification: Theoretical Content		
	<p>Assessment: Coursework - 0%; Course Test - 20%; Practical - 40%; Examination - 40%</p> <p>Competency: On completing, the student should be able to use both the hand tools and carpentry equipment to produce woodwork and maintain the facilities.</p> <p>References: (1) R. Bayliss "Carpentary and Joinery" Book 1-4 (2) Brett, P. "Purpose made Joinery"</p>	

Block Laying and Concreting Workshop Practice

Course: Block laying and Concreting Workshop Practice		Course Code: QUS 106	Contact Hours: HRS 0-0-3
Course Specification: Theoretical Content			
General Objective: 1.0: Know block laying and concreting tools, equipment and their uses and maintenance procedures			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 4	<p>1.1 Select block laying and concreting tools and equipment such as block laying trowel, pointing trowel, spirit level, builders' square, straight edge (range), wooden float, concrete mixers, vibrators, concrete forms, and block moulding machines for specific job requirements.</p> <p>1.2 Use the tools and equipment in 1.1 above.</p> <p>1.3 Maintain the tools and equipment in 1.1 above.</p> <p>1.4 Select cutting and plastering tools such as club hammer, boister chisel, cold chisel, brack saw, hacksaw for specific job requirements.</p>	<ul style="list-style-type: none"> • The various tools should be shown to the student and the uses should be explained. • Student should be taught how the tools are to be used. • Student should be led to start to use them as appropriate. 	<ul style="list-style-type: none"> • Block laying trowel, spirit level, builders' square, straight edge, wooden float, cement mixers, vibrators, block laying, machines, chisel, hammer, hacksaw, brick saw, chalkboard, chalk.
General Objective 2.0: Understand factory act and safety regulations applicable in the blocklaying and concreting workshop.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5 - 8	<p>2.1 Chose adequate ventilation for the workshop.</p> <p>2.2 Create safe storage for tools and first aid equipment.</p>	<ul style="list-style-type: none"> • Explain the necessary safety regulations to student and reasons. 	<ul style="list-style-type: none"> • Safety regulations handbook • Chalkboard • Chalk
7 - 8	<p>2.3 Demonstrate general safety habits with respect to the equipment.</p> <p>2.4 Demonstrate the layout of an ideal blocklaying and concreting workshop.</p>		

Course: Block laying and Concreting Workshop Practice		Course Code: QUS 106	Contact Hours: HRS 0-0-3
Course Specification: Theoretical Content			
General Objective 3.0: Know blocks and concrete materials			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9 - 11	3.1 Differentiate between various types of fine aggregates, coarse aggregates blocks, concrete and additives. 3.2 Illustrate types of concrete products 3.3 Select suitable aggregates for different kinds of construction works 3.4 Carry out various tests on blocks and concrete materials	<ul style="list-style-type: none"> • Explain with the products the differences between the aggregates • Let the student be able to identify the materials etc. 	<ul style="list-style-type: none"> • Sharp sand, granite, soft sand, additives, chalkboard, chalk, writing materials
General Objective 4.0: Understand the various methods of block and bricklaying and concreting			
Week	Specific Learning Outcome:	Teachers Activities	Resources
12 - 13	4.1 Lay blocks of various types and sizes 4.2 Lay wet concrete for simple slabs, beams and lintels 4.3 Carry out various ways of vibrating, finishing and curing concrete	Ditto	ditto
General Objective 5.0: Know different types of brick and block walls and their types of bonds			
Week	Specific Learning Outcome:	Teachers Activities	Resources
14-15	5.1 Construct various types of bonds in a block work and brickwork. 5.2 Construct block walls of different thickness	Explain using relevant examples Use painting workshop materials for demonstration	Chalkboard, chalk, duster, painting workshop and materials, charts
<p>Assessment: Coursework - 0%; Course Test - 20%; Practical - 40%; Examination - 40%</p> <p>Competency: The student should be able to produce concrete and mortar to lay bricks and blocks in various bonds and supervise such jobs on the site.</p> <p>References: (1) R. Chudley "Construction Technology" Longman, Vol. 1-4 (2) Obande "Bricklaying and Concreting" Longman</p>			

Workshop Practice and Technology

Course: Workshop Practice and Technology		Course Code: QUS 205	Contact Hours: 0-0-4
Course Specification: Theoretical Content			
General Objective 1.0: Understand Painting and decoration in Bottling works.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 2	1.1 Define the terms painting and decoration as they apply to building and other facilities 1.2 List the components of paint 1.3 Explain the functions of each of the constituents used in making paint 1.4 Describe the types of paint in use and their specific peculiarities i.e. emulsion, oil, etc. 1.5 State the conditions for use of each paint type 1.6 Illustrate the methods of preparing surfaces for painting 1.7 Demonstrate the methods of application of paint 1.8 Apply paint to surface materials like block/brick work, concrete, metal etc 1.9 Maintain paint brushes, rollers, spray guns etc.	<ul style="list-style-type: none"> • Explain using relevant examples • Use painting workshop materials for demonstration 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, painting workshop and materials, charts
General Objective 2.0: Understand the preservative characteristics			
Week	Specific Learning Outcome:	Teachers Activities	Resources
3	2.1 Discuss the preservation characteristics of paint i.e. moisture prevention, rust prevention, etc, 2.2 Mix paint to the right constituents for application using brush, roller or spray gun 2.3 Identify additives which are available for use with paint as preservative and weathering preventive treatment	ditto	ditto

Course: Workshop Practice and Technology		Course Code: QUS 205	Contact Hours: 0-0-4
Course Specification: Theoretical Content			
General Objective 3.0: Know the defects in painting			
Week	Specific Learning Outcome:	Teachers Activities	Resources
4	3.1 Identify the defects in paintwork 3.2 State their causes and remedies	Ditto	Ditto
General Objective 4.0: Know plumbing tools and equipments			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5	4.1 Identify plumbing tools and equipment 4.2 Select plumbing tools and equipment 4.3 Use the tools in 4.1 and portable power tools and equipment. 4.4 Maintain the tools used in 4.2 above	<ul style="list-style-type: none"> • Explain using relevant examples • Use plumbing workshop materials for demonstration • Allow students use tools and equipment 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, plumbing workshop, charts, models
General Objective 5.0: Understand factory acts and safety regulations applicable in plumbing works			
Week	Specific Learning Outcome:	Teachers Activities	Resources
6	5.1 Propose adequate ventilation for the workshop 5.2 Create safe storage facilities for tools and first aid equipment 5.3 Demonstrate general safety habits with respect to plumbing equipment and tools 5.4 Illustrate the layout of an ideal plumbing workshop	<ul style="list-style-type: none"> • Explain using relevant examples 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts, models, safety regulations, plumbing workshop/its materials and equipment
General Objective 6.0: Know plumbing materials for various job purposes			
Week	Specific Learning Outcome:	Teachers Activities	Resources
7	6.1 Select pipes and tubes used in plumbing work for hot and cold water, waste, soil and ventilating pipes, drainage and domestic control heating. 6.2 Identify their sizes, weights and gauges. 6.3 Apply methods of jointing manipulation and fixing. 6.4 Prepare threading and jointing pipes in galvanized iron, copper and plastic.	<p>Ditto</p> <ul style="list-style-type: none"> • Show live examples 	Ditto

Course: Workshop Practice and Technology		Course Code: QUS 205	Contact Hours: 0-0-4
Course Specification: Theoretical Content			
General Objective 7.0: Understand various types of water plumbing systems			
Week	Specific Learning Outcome:	Teachers Activities	Resources
8	7.1 Explain the properties of water based on common sources of supply. 7.2 State the rules to be followed in piping for water supply. 7.3 Observe connections to water mains. 7.4 Illustrate the domestic systems of cold and hot water supply.	Ditto	Ditto
General Objective 8.0: Know the different methods of installing and fixing appliances			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9	8.1 Illustrate plumbing constructional features 8.2 Install sanitary appliances, fittings, soil/water/ventilating pipes	Ditto	Ditto
General Objective 9.0: Know the various drainage systems			
Week	Specific Learning Outcome:	Teachers Activities	Resources
10	9.1 Show general layout and construction methods for drainage systems. 9.2 Differentiate between private and public sewage systems 9.3 Test drains and soil pipes	<ul style="list-style-type: none"> • Explain using relevant examples. • Show students live example. 	Ditto
General Objective 10.0: Understand Electrical Installation involved in the building process.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
11	10.1 Explain the safety precautions required in workshops and site e.g. how human body can become part of electric circuit and remedy needed: severe electric shock and artificial respirations. 10.2 Describe electrical symbols and regulations with special reference to IEE regulations. 10.3 Identify tools and equipment used in simple electrical works and their maintenance requirements.	<ul style="list-style-type: none"> • Explain using relevant examples. • Use any live example to demonstrate. • Use question and answer technique to test understanding. • Give practical assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts, models, IEE regulations, Electrical Engineering workshop/its materials and equipment.

Course: Workshop Practice and Technology		Course Code: QUS 205	Contact Hours: 0-0-4
Course Specification: Theoretical Content			
General Objective 10.0: Understand Electrical Installation involved in the building process.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
11	10.4 Identify accessory types in use, e.g. lb, sw, dfb, ccu, plug and the like, main switches, fuses, distribution boards, and other protective systems e.g. ELCB.		
12	10.5 Explain the process of electricity generation, transmission and distribution 10.6 Describe the different types of generators 10.7 Explain electrical power distribution systems e.g. 1 and 4 wire system for both AC and DC.	Ditto	Ditto
13 - 14	10.8 Explain the meaning of power factor and the effect of power factor on cable sizes. 10.9 Describe types of cables and where used e.g. MICO. 10.10 Identify cable colours and regulations applicable. 10.11 Illustrate the current rating of cables, joints, soldering techniques and regulations applicable. 10.12 Prepare ends of cable for entry into accessories. 10.13 Install the following electrical wiring conduit and surface. 10.14 Describe PVC.	Ditto	Ditto
15	10.15 Carry out bending, cutting and threading of conduit. 10.16 List the types of conduits for practical wiring exercises. 10.17 Demonstrate the following practical wiring diagrams: simple lighting points wiring 1-way, 2-way, and intermediate switches. 10.18 Illustrate series, and parallel circuits. 10.19 Demonstrate wiring socket outlet, plugs and looping system.	Ditto	Ditto

Course: Workshop Practice and Technology		Course Code: QUS 205	Contact Hours: 0-0-4
Course Specification: Theoretical Content			
General Objective 10.0: Understand Electrical Installation involved in the building process.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
15	10.20 Prepare conversion from 1-way to 2-ways electrical bells and indicating systems. 10.21 Describe regulations applicable to earthing systems.	Ditto	Ditto
<p>Assessment: Coursework - 0%; Course Test - 20%; Practical - 40%; Examination - 40%</p> <p>Competency: The student, should be able to select, construct and supervise painting, plumbing and electrical installation materials and works.</p> <p>References: (1) Tubb, L.F.J. "Painting and Decorating" (2) McGuinness W.J. Building Technology Mechanical and Electrical System</p>			

Maintenance Technology

Course: Maintenance Technology		Course Code: QUS 212	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Understand the meaning of the terms used in maintenance and repairs and related facilities			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1 - 2	1.1 Define the terms used in the practice of repairs and maintenance of building and related facilities 1.2 Explain the terms used in building maintenance and related facilities	<ul style="list-style-type: none"> • Explain the meaning of maintenance generally, narrow this to building maintenance • Give the various terms used in building maintenance 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster
General Objective 2.0: Understand the ground geological fault and their effects on building			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
3 - 5	2.1 Explain the geological faults which cause defects in the foundation of building 2.2 Explain the effects of foundation failures on the walls of buildings 2.3 Illustrate the ground faults and the remedies to foundations 2.4 Describe the remedies to various foundation failures	<ul style="list-style-type: none"> • Explain faults generally • Explain the meaning of geological fault • Show how such fault cause defects in foundation of building • Show the effect of foundation failures on the walls of building • Explain how these faults can be remedied 	<p style="text-align: center;">Ditto</p> <p style="text-align: center;">Ditto</p>
General Objective 3.0: Understand the types of defects which affect brick, block works and masonry and remedies for them			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
6 - 9	3.1 State the types of defects in brick, sand Crete/concrete wall, block wall, sand masonry walls and timber 3.2 Explain the causes of decay in block-wall and sand Crete/concrete wall and masonry wall and timber 3.3 Explain the remedies for the above defects in 3.1	<ul style="list-style-type: none"> • Explain the various defects in walls • Give examples of such defects question/answer of decay in walls and timber • Question/answer on causes of decay in walls and timber • Explain remedies for decay in walls and timber 	<p style="text-align: center;">Ditto</p>

Course: Maintenance Technology		Course Code: QUS 212	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 4.0: Understand the causes of defects and their remedies in low-rise buildings.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
10 - 15	<p>4.1 State the types of defects in roofs.</p> <p>4.2 Explain the cause and effects of defects in roofs.</p> <p>4.3 Propose simple methods of remedy to the defects in low-rise building.</p> <p>4.4 Explain the causes and effects of rising damp and penetrating damp on structures and fabric e.g. walls, floors, roofs etc.</p> <p>4.5 Propose simple methods of preventing and remedies for 4.1 above.</p> <p>4.6 State the effect of technology on maintenance.</p>	<ul style="list-style-type: none"> • Questions/answers on different types of roofs. • Describe roof defects. • Explain the effect of defects on roof. • Explain a simple method of roof remedy for simple building. • Explain generally the effect of technology on maintenance. 	Ditto
<p>Assessment: Coursework - 20%; Course Test - 20%; Practical - 20%; Examination - 40%</p> <p>Competency: The student should be able to maintain basic defects in building works.</p> <p>References: (1) Reginald, Lee "Building Maintenance" (2) Scott, G. "Building Disasters and Failures"</p>			

Wood Workshop Practice (Practical)

Course: Wood Workshop Practice		Course Code: QUS 105	Contact Hours: 1-0-3
Course Specification: Practical Content			
General Objective 1.0: Know woodworking tools and equipment. now the types and characteristics of timber used for various work purposes.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 3	<p>a. Use the cramps and shooting board.</p> <p>b. Use geometrical tools such as marking gauges, tapes, pencil caliper, wing compasses, the tee-square and sliding level.</p> <p>c. Use cutting tools such as saws, chisels and planes.</p> <p>d. Illustrate the differences between fixing tools such as Hammer, mallets, nail punches and screw drivers and the Ratchet brace.</p>	<ul style="list-style-type: none"> • Show tools and equipment to student, give and supervise assignments. 	<ul style="list-style-type: none"> • Chalkboard, chalks, marking gauges, tapes, pencil, caliper, compasses, saws, chisels, hammer, mallets, nail punchet, screw driver, Ratchet Brace, • Planes, tee-square, sliding level.
4 - 5	<p>e. Illustrate the layout of an ideal wood workshop.</p> <p>f. Illustrate the growth, structure and shrinkage of timber.</p> <p>g. Identify hardwood from softwood.</p> <p>h. Describe suitable timber conversion methods such as slab saw, tangential sawing and quarter sawing.</p>	<ul style="list-style-type: none"> • Illustrate with diagrams. • Demonstrate with physical samples and supervise assignments. 	<ul style="list-style-type: none"> • Chalkboard, chalk, Duster, Charts.
6	<p>Describe timber preservation methods:</p> <p>i. Wood preservative oil method.</p> <p>ii. Waterborne preservative method.</p> <p>iii. Other preservation methods like pressure process, open tank (hot and bath process), and brush, dip stray applications.</p> <p>i. Identifying the various types and sizes of timber available for use in the market.</p>	<ul style="list-style-type: none"> • Demonstrate with samples 	

Course: Wood Workshop Practice		Course Code: QUS 105	Contact Hours: 1-0-3
Course Specification: Practical Content			
General Objective 2.0: Know the different types of jointing materials			
Week	Specific Learning Outcome:	Teachers Activities	Resources
7 - 8	<ul style="list-style-type: none"> a. Use nails of different sizes on given job types. b. Use various types of screws such as raised head, round head, counter sunk head and coach or square head on given job types. c. Use other materials such as bolts and nuts, timber connectors, etc. 	<ul style="list-style-type: none"> • Demonstrate with real objects. 	<ul style="list-style-type: none"> • Real objects like, Screws, nuts etc • Chalkboard, chalk.
General Objective 3.0: Know the various types of wood joints.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9-11 12-15	<ul style="list-style-type: none"> a. Construct widening joints, tongue and groove joints, frame joint,. b. Tee and cross halving joint. c. Common mortise and tenon, haunched tenon joint. d. Long and short shouldering mortise and tenon with rebate, dovetail joint, housing joint and dowel joint. e. Know the various Woodworking machine in use f. Use the machines as stated above. g. Maintain the machines listed above. 	<ul style="list-style-type: none"> • Demonstrate clearly to students and • Supervise practical assignment to students. 	Ditto

Block Laying and Concreting Workshop Practice (Practical)

Course: Block laying and Concreting Workshop Practice		Course Code: QUS 106	Contact Hours: HRS 0-0-3
Course Specification: Practical Content			
General Objective 1.0: Know block laying and concreting tools, equipment and their uses and maintenance procedures			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1 - 8	1.1 Use and maintain the tools and equipment as stated above. 1.2 Demonstrate general safety habits with respect to the equipment.	<ul style="list-style-type: none"> • Show student the various types of tools, demonstrate and supervise assignments. • Demonstrate with physical tools. 	<ul style="list-style-type: none"> • Block laying trowel, spirit level, builders' square, straight edge, wooden float, cement mixers, vibrators, block laying, machines, chisel, hammer, hacksaw, brick saw, chalkboard, chalk.
General Objective 2.0: Know blocks and concrete materials			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
9 - 13	2.1 Carry out various tests on blocks and concrete materials. 2.2 Understand the various methods of block and bricklaying and concreting, Lay blocks of various types and sizes, Lay wet concrete for simple slabs, beams and lintels. 2.3 Carry out various ways of vibrating, finishing and b. curing concrete.	<ul style="list-style-type: none"> • Demonstrate and supervise assignments. 	Ditto
General Objective 3.0: Know different types of brick and block walls and their types of bonds			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
14 - 15	3.1 Construct various types of bonds in a block work and brickwork. 3.2 Construct block walls of different thickness.	Ditto	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, painting workshop and materials, charts.

Workshop Practice and Technology (Practical)

Course: Workshop Practice and Technology		Course Code: QUS 205	Contact Hours: 0-0-4
Course Specification: Practical Content			
General Objective 1.0: Understand Painting and decoration in Bottling works.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1	a. Apply paint to surface materials like block/brick work, concrete, metal etc b. Mix paint to the right constituents for application using brush, roller or spray gun. c. Know the defects in painting d. Identify the defects in paintwork	• Explain using relevant examples • Use painting workshop materials for demonstration Ditto	• Chalkboard, chalk, duster, painting workshop and materials, charts Ditto
General Objective 2.0: Know plumbing tools and equipments			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
5	a. Identify plumbing tools and equipment. b. Use the above and portable power types and maintain them. c. Understand factory acts and safety regulations applicable in plumbing works	• Show students types of tools and equipment and supervise. • Assignments.	• Chalkboard, chalk, duster, plumbing workshop, charts, models
6	d. Demonstrate general safety habits with respect to plumbing equipment and tools.	• Demonstrate to students using tools and equipment.	• Chalkboard, chalk, duster, charts, models, safety regulations, plumbing workshop/its materials and equipment
General Objective 3.0: Know plumbing materials for various job purposes			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
7	a. Identify their sizes, weights and gauges. b. Prepare threading and jointing pipes in galvanized iron, copper and plastic.	• Demonstrate using practical examples.	Ditto

Course: Workshop Practice and Technology		Course Code: QUS 205	Contact Hours: 0-0-4
Course Specification: Practical Content			
General Objective 4.0: Understand various types of water plumbing systems			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
8	a. Carryout the domestic systems of cold and hot water supply.	Ditto	Ditto
General Objective 5.0: Know the different methods of installing and fixing appliances			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
9	a. Install sanitary appliances, fittings, oil/water/ventilating pipes.	Ditto	Ditto
General Objective 6.0: Know the various drainage systems			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
13-15	a. Test drains and soil pipes.	Ditto	Ditto
	b. Carry out bending, cutting and threading of conduit	Ditto	Ditto
	c. Install conversion from 1-way to 2-ways electrical bells and indicating systems.		

Maintenance Technology (Practical)

Course: Maintenance Technology		Course Code: QUS 212	Contact Hours: 1-0-2
Course Specification: Practical Content			
General Objective 1.0: Understand the meaning of the terms used in maintenance and repairs and related facilities			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 7	<p>a. Identify the geological faults which cause defects in the foundation of building.</p> <p>b. Rectify the effects of foundation failures on the walls of buildings.</p> <p>c. Identify the ground faults and the remedies to foundations.</p>	<ul style="list-style-type: none"> • Visit site and show practical defects. • Show the effect of foundation failures on the walls of building • Explain how these faults can be remedied 	<p>Chalkboard, chalk, duster, charts, models, safety regulations, plumbing workshop/its materials and equipment</p>
General Objective 2.0: Understand the types of defects which affect brick, block works and masonry and remedies for them			
Week	Specific Learning Outcome:	Teachers Activities	Resources
8 - 15	<p>a. Identify the types of defects in brick, sand Crete/concrete wall, block wall, sand masonry walls and timber.</p> <p>b. Identify the causes of decay in block-wall and sand Crete/concrete wall and masonry wall and timber.</p> <p>c. Apply the remedies for the above defects in 3.1.</p> <p>d. Propose simple methods of remedy to the defects in low-rise building.</p> <p>e. Propose simple methods of preventing and remedies.</p>	<ul style="list-style-type: none"> • Explain the various defects in walls. • Give examples of such defects question/answer of decay in walls and timber. • Question/answer on causes of decay in walls and timber. • Explain remedies for decay in walls and timber. 	Ditto

Civil Engineering Courses

Introduction to Engineering Geology

Course: Introduction to Engineering Geology		Course Code: QUS 112	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Know the nature and composition of the Earth Crust			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 3	1.1 Explain the geological formation of the earth 1.2 State the 3 different types of rock 1.3 Explain the formation of the 3 different types of rocks 1.4 Explain the physical characteristics of minerals 1.5 Describe the chemical composition of rocks 1.6 Identify the petrological characteristics 1.7 Explain the formation of sedimentary rocks 1.8 Describe fully the different types of erosion 1.9 Describe all forms of soil deposit 1.10 Explain earthquake, isostasy, ocean floor and continental drift, modern plate tectonics	<ul style="list-style-type: none"> • Illustrate with diagrams 	<ul style="list-style-type: none"> • Chalkboard, chalk, Duster, Rock samples.
General Objective 2.0: Know all aspect of structural Geology			
Week	Specific Learning Outcome:	Teachers Activities	Resources
4 - 5	2.1 Explain the different aspects of geology (stril, joints, cleavage, dip, fold, fault, slides and thrust) 2.2 Describe the relationship between strata and outcrops 2.3 Interpret given geological survey maps 2.4 Produce dip and strikes from given geological maps	<ul style="list-style-type: none"> • Field Trip. • Show films to explain this aspect. 	<ul style="list-style-type: none"> • Chalkboard, chalk, Duster, Geological Maps, Projectors, slide films.

Course: Introduction to Engineering Geology		Course Code: QUS 112	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 3.0: Understand surface processes.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
6	3. 1 Describe the agents of denudation and other types of weathering. 3.2 Describe product of denudation.	Ditto	Ditto
General Objective 4.0: Understand principal geological factors affecting some engineering projects			
Week	Specific Learning Outcome:	Teachers Activities	Resources
7 - 12	4.1 Describe the geological factors affecting stability of slopes, cutting and embankment. 4.2 Mention geological condition affecting impounded surface water (reservoir and dam sites). 4.3 Describe geological consideration in tunneling, drilling and foundations.	Ditto	Ditto
<p>Assessment: Coursework - 10%; Course Test - 20%; Practical - 10%; Examination - 60%</p> <p>Competency: The student should be exposed to basic geology and apply it to building works.</p> <p>References: (1) Bolton, M. "A Guide to Soil Mechanics" (2) Farmer, I. "Engineering Behaviour of Rocks"</p>			

Strength of Materials and Structures

Course: Strength of Materials and Structures		Course Code: QUS 203	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Understand the relationship between stress and strain, theory of elasticity and elastic constants			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 4	1.1 Define load. 1.2 Explain tension and compression forces. 1.3 Explain stress and strain. 1.4 Define Hooke's law. 1.5 Explain modulus of elasticity. 1.6 Explain the relationship between stress and strain tension. 1.7 Define limit of proportionality, elastic limit, yield point, ductility, brittleness, permanent set. 1.8 Explain shear stress, shear strain, modulus of rigidity, strain energy. 1.9 Illustrate the method of analysis of composite rods with axial tension or compression.	<ul style="list-style-type: none"> • Explain using relevant examples. • Illustrate terms by experiment in the lab. • Give assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, structures laboratory.
	1.10 Explain pure normal stress on a given plane - principal planes, and principal stresses. 1.11 Explain the importance of principal stresses. 1.12 Calculate principal stresses. 1.13 Determine normal and shear stresses on a plane using Mohr's circle of stress. 1.14 Define poisson's Ratio ν . Modulus of elasticity and Modulus of rigidity G (elastic constants).	<ul style="list-style-type: none"> • Explain using relevant examples. • Calculate principal stress. • Give assignment. • Explain using relevant examples. • Use question and answer to test understanding. • Give assignment 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculator. Ditto

Course: Strength of Materials and Structures		Course Code: QUS 203	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 2.0: Know how to determine reactions bending moments, shear force value and their diagram			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5	2.1 Define Bending Moment and Shear Force. 2.2. Describe types of loads, and types of support. 2.3. Explain the equations of equilibrium. 2.4. Illustrate sign conventions for B.M and S.F.	<ul style="list-style-type: none"> • Explain using relevant examples. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.
6 - 8	2.5. Determine the relations between load shear force and Bending Moment. 2.6. Calculate shear force and Bending moment values on: <ul style="list-style-type: none"> a. Simply supported beam and b. Cantilever beam (with concentrated and uniformly distributed loads). 2.7 Draw Bending moment and shear force diagram. 2.8 Use graphical method of determination of reaction, shear force and bending moments.	<ul style="list-style-type: none"> • Explain using relevant worked example. • Give life examples of occurrence of the terms. • Give assignment. • Explain using relevant worked example. • Give assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculator. • Chalkboard, chalk, duster, calculator, scale rule, graph paper.
General Objective 3.0: Understand moments of Inertia, products of inertia, maximum and minimum principal axis, neutral axis, bending stress, shear stress in beams.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9 - 12	3.1 Explain general principles of simple bending. 3.2 Determine the position of neutral axis. 3.3 Calculate moments of inertia. 3.4 Determine bending stress in Beam section. 3.5 Calculate combined bending and direct stress.	Ditto	Ditto

Course: Strength of Materials and Structures		Course Code: QUS 203	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 3.0: Understand moments of Inertia, products of inertia, maximum and minimum principal axis, neutral axis, bending stress, shear stress in beams.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9 - 12	3.6 Determine shear stresses in rectangular - and I-beam section. 3.7 Determine product of inertia, rotation of axis, maximum and minimum values of principal axis.	Ditto	Ditto
General Objective 4.0: Understand statistics and graphical resolution of forces.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
13 - 15	4.1 Define equilibrium of concurrent and non-concurrent coplanar forces. 4.2 Illustrate polygon of forces. 4.3 Analyze resolution of forces.	Ditto	Ditto
<p>Assessment: Coursework - 20%; Course Test - 20%; Practical - 10%; Examination - 50%</p> <p>Competency: The student should be exposed to analyse problems in statics and dynamics of structures.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Joiner, J. H. "Strength of materials". 2. Timoshenko, S. P. and Goodier, J. N. "Theory of Elasticity" Mcgraw Hill, 1970" 			

Introduction to soil Mechanics

Course: Introduction to Soil Mechanics		Course Code: QUS 211	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Know about soil mechanics, its applications and classifications in Civil Engineering			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1 - 4	1.1 Define soil mechanics. 1.2 Differentiate between engineering soil and others. 1.3 Explain the role of soil in civil engineering. 1.4 Explain the different types of soil. 1.5 Explain classification of soil.	<ul style="list-style-type: none"> • Explain using relevant examples. • Carry out classification of soil test. • Give students assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts, soil mechanics laboratory equipment and materials, calculator.
	1.6 Explain classification by Grain size and M.T.I/consistency method. 1.7 Describe in detail the properties of soil aggregate (void ratio, porosity, moisture content etc). 1.8 Work test examples of above.	<ul style="list-style-type: none"> • Use relevant examples to explain. • Demonstrate relevant soil test in lab. 	Ditto
	1.9 Perform soil classification test e.g. identification, specific gravity, sieve analysis, consistency limits.	<ul style="list-style-type: none"> • Carry out soil classification tests in lab. • Make students carry out the test. 	Ditto
General Objective 2.0: Know Darcy's law and permeability in soil.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
5 - 6	2.1 State Darcy's Law. 2.2 Explain the principles of Darcy's law. 2.3 Describe the constant head and falling head permeameters. 2.4 Perform permeability tests. 2.5 Describe one method of measuring the permeability of soil in the field.	<ul style="list-style-type: none"> • Explain using relevant examples. • Perform permeability test. • Make the students carry out the test. 	Ditto

Course: Introduction to Soil Mechanics		Course Code: QUS 211	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 3.0: Know about surface drainage and ground water lowering			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
6 - 7	3.1 Describe surface drainage and wells 3.2 Explain the method of lowering water in ground water and wells 3.3 Work test examples on all above	<ul style="list-style-type: none"> • Use relevant examples to explain • Demonstrate test example 	Ditto
General Objective 4.0: Know the principle of Neutral and effective stress			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
8	4.1 Use piston and spring analogy to substantiate neutral and effective stresses 4.2 Sketch stress distributed load	<ul style="list-style-type: none"> • Explain using relevant example 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, graph sheets, calculator
General Objective 5.0: Understand the principles of compaction and its determination in the laboratory and on site.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
9 - 11	5.1 Explain the compaction of soil. 5.2 State the different method of compaction. 5.3 State the different forms of fluid control compaction characteristics. 5.4 Describe the three standard compaction test. 5.5 Perform in the laboratory these three tests in 5.4 above.	<ul style="list-style-type: none"> • Explain using relevant examples. • Demonstrate compaction test. • Make student to carry out the test. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster
	5.6 Describe a field compaction test.	<ul style="list-style-type: none"> • Explain using relevant examples. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts.

Course: Introduction to Soil Mechanics		Course Code: QUS 211	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
	<p>5.7 Describe the type of equipment used for compaction movement of earth on site.</p> <p>5.8 Explain how compaction plant is selected for different types of soils.</p> <p>5.9 Explain the site compaction procedure.</p> <p>5.10 Illustrate how to achieve site compaction control.</p> <p>5.11 Describe field compaction tests.</p> <p>5.12 Perform field compaction tests.</p>	<ul style="list-style-type: none"> • Explain using relevant examples. • Take students to a site to perform field compaction tests. 	Ditto
General Objective 6.0: Know about California Bearing Ratio (CBR).			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
12	<p>6.1 Explain California bearing ratio.</p> <p>6.2 Conduct California bearing ratio on site.</p> <p>6.3 State its use in relation to design of road pavement.</p> <p>6.4 Design different layers of pavement using CBR values.</p>	<ul style="list-style-type: none"> • Explain using relevant examples. • Carry out CBR test on a site. • Guide the students to design pavement. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts, Soil Mechanics laboratory equipment and materials.
General Objective 7.0: Understand soil Stabilization			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
13-15	<p>7.2 Explain the different types of soil stabilization (mechanical, cement, lime, bitumen etc).</p> <p>7.2 Work test examples.</p>	<ul style="list-style-type: none"> • Use relevant examples to explain. • Give students assignments. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts.
<p>Assessment: Coursework - 20%; Course Test - 20%; Practical - 10%; Examination - 50%</p> <p>Competency: On completing, the student should be exposed to basic theories of strength of materials in relation to the design of structures.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Coleman, R.A. "Structural System Design" 2. Croll, J.G.A. "Elements of Structural Stability" 			

Course: Introduction to Soil Mechanics		Course Code: QUS 211	Contact Hours: 1-0-2
Course Specification: Practical Content			
General Objective 1.0: Know about soil mechanics, its applications and classifications in Civil Engineering			
Week	Specific Learning Outcome	Teachers Activities	Resources
1 - 4	a. Perform soil classification test e.g. identification, specific gravity, sieve analysis, consistency limits.	<ul style="list-style-type: none"> • Carry out classification of soil test. • Give students assignment. • Make students carry out the test. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts, soil mechanics laboratory equipment and materials, calculator.
General Objective 2.0: Know Darcy's law and permeability in soil.			
Week	Specific Learning Outcome	Teachers Activities	Resources
5 - 6	a. Use the constant head and falling head permeameters. b. Perform permeability tests.	<ul style="list-style-type: none"> • Perform permeability test. • Make the students carry out the test. 	Ditto
General Objective 3.0: Understand the principles of compaction and its determination in the laboratory and on site.			
Week	Specific Learning Outcome	Teachers Activities	Resources
10 - 11	a. Perform in the laboratory the three tests of Compaction b. Perform field compaction tests.	<ul style="list-style-type: none"> • Explain using relevant examples. • Take students to a site to perform field compaction tests. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster
General Objective 4.0: Know about California Bearing Ratio (CBR).			
Week	Specific Learning Outcome	Teachers Activities	Resources
12	a. Conduct California bearing ratio on site. b. Design different layers of pavement using CBR values.	<ul style="list-style-type: none"> • Explain using relevant examples. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts, Soil Mechanics laboratory equipment and materials.
General Objective 5.0 Understand soil Stabilization			
Week	Specific Learning Outcome	Teachers Activities	Resources
13-15	a. Carryout different types of soil stabilization (mechanical, cement, lime, bitumen etc).	<ul style="list-style-type: none"> • Use relevant examples to explain. • Give students assignments. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts.

Strength of Materials & Structures (Practical)

Course: Strength of Materials and Structures		Course Code: QUS 203	Contact Hours: 1-0-2
Course Specification: Practical Content			
General Objective 1.0: Understand the relationship between stress and strain, theory of elasticity and elastic constants			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1 - 4	a. Determine normal and shear stresses on a plane using Mohr's circle of stress.	<ul style="list-style-type: none"> • Use question and answer to test understanding. • Give assignment 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculator.
5 - 8	b. Determine the relations between load shear force and Bending Moment c. Draw Bending moment and shear force diagram. d. Use graphical method of determination of reaction, shear force and bending moments.	<ul style="list-style-type: none"> • Explain using relevant worked example. • Give assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculator, scale rule, graph paper.
General Objective 2.0: Understand moments of Inertia, products of inertia, maximum and minimum principal axis, neutral axis, bending stress, shear stress in beams.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
9-12	a. Determine shear stresses in rectangular - and I-beam section. b. Determine product of inertia, rotation of axis, maximum and minimum values of principal axis.	Ditto	Ditto

Computer Courses

Introduction to Computing

PROGRAMME: WORD PROCESSING			
Course: Introduction to Computing		Course Code: ICT 101	Contact Hours: 0-0-3
<p>Course Objectives: To give the students the skill needed to appreciate the use of computers and us specialist software Packages in a competent manner, within their own engineering specialty. The learning methodology should be student centered, with the student using various available packages in order to be competent when using them. The use of student workbooks or guided learning materials is recommended.</p>			
<p>Key Objectives: The outcome from the learning process should be that the student would be able to do the following.</p>			
Week	Specific Learning Outcome	Teachers	Resource
1	a. Define what is meant by a computer. b. Know the history of computer development (briefly). c. State the uses of computers and understand the impact of the PC on computer technology. d. Differentiate between hardware and software. e. Understand the input-process-output algorithm (hardware). <ul style="list-style-type: none"> i. Central processor ii. Input mechanisms iii. Output mechanisms 	<ul style="list-style-type: none"> • Define what is meant by a Computer. • Teach the history of Computers developments. (Briefly). • Teach the uses of computers and the impact of PC on the society: home, office, banks etc. 	<ul style="list-style-type: none"> • Maximum of 4 students to 1 computer. • Maximum of 4 computers to a printer except when a Network is in use. • 1 Ream of A4 papers to 10 students. • 4 Ink cartridge per printer per semester.
2	a. Know how data is stored <ul style="list-style-type: none"> i. RAM ii. ROM iii. Fixed discs iv. Removable discs a. Understand the concept of an operating system <ul style="list-style-type: none"> i. PC-DOS/MS-DOS ii. Windows iii. Linux iv. Unix 	<ul style="list-style-type: none"> • Explain the need for data storage. Dismantle a computer system and show the students the RAM card, the Hard Disk and the Processors. • Explain the concept of an operating system. 	

PROGRAMME: WORD PROCESSING			
Course: Introduction to Computing		Course Code: ICT 101	Contact Hours: 0-0-3
Week	Specific Learning Outcome	Teachers	Resource
3	a. Access computers correctly through Windows operating system. <ul style="list-style-type: none"> i. Open/Close a window ii. Program Manager iii. Button bars/scroll bars/menu bars iv. Moving from one window to another 	<ul style="list-style-type: none"> • Discuss the advantage of the Windows Operating System. • Explain the windows menu and tools. Each student must be given an opportunity to start a computer, open/close the window operating system, understand the program manager and move around in the windows environment.	
4	a. Understand file management and how to manage files. <ul style="list-style-type: none"> i. Creating a file and folder. ii. Manipulating files (moving, copying, saving, deleting). iii. Print manager. 	<ul style="list-style-type: none"> • Explain the process of creating a file, manipulating the file and use of the print manager. 	
	a. Understand the concept of a software package. <ul style="list-style-type: none"> i. MS Office ii. Lotus Smartsuite iii. MS Encarta 	<ul style="list-style-type: none"> • Load MS Office with the students and explain the various packages that make up MS Office. Load MS. • Encarta and discuss its use with the students. 	
5 - 6	a. Demonstrate ability in the competent use of a word-processing package such as MS Word (or equivalent standard). <ul style="list-style-type: none"> i. Entering text ii. Formatting text (boldening, font size, italicizing). iii. Creating and Saving text files iv. Editing and moving text v. Importing objects 	<ul style="list-style-type: none"> • Demonstrate the installation of MS Words. • Identify the different features of the software. • Ask students to type a short document and save it. • Ask students to edit a document and carry out a spelling check. • Demonstrate the use of tables. 	

PROGRAMME: WORD PROCESSING			
Course: Introduction to Computing		Course Code: ICT 101	Contact Hours: 0-0-3
Week	Specific Learning Outcome	Teachers	Resource
5 - 6	<ul style="list-style-type: none"> vi. Spelling and Grammar Checking. vii. Creating and manipulating tables, text boxes, equations. viii. Printing 		
7-9	<p>a. Demonstrate ability in the competent use of a graphics package such as Corel Draw (or equivalent standard).</p> <ul style="list-style-type: none"> i. Drawing tools ii. Text as graphics iii. Creating and saving image files iv. Editing and moving images v. Importing and exporting graphics vi. Windows 'Clipboard' facility vii. Creating and manipulating images (re-sizing etc). viii. Image file standard (JPEG, PCX, GIF etc) ix. Printing 	<ul style="list-style-type: none"> • Load Corel Draw. • Explain features of the soft wares. • Demonstrate the creating and saving of images. • Edit the images saved. • Export the graphics to other packages. • Demonstrate the manipulation (re-sizing) of images. 	
10-11	<p>a. Demonstrate ability in the competent use of a spreadsheet package such as MS Excel (or equivalent standard).</p> <ul style="list-style-type: none"> i. Setting up the worksheet ii. Entering data 	<ul style="list-style-type: none"> • Load MS Excel. • Explain features of the software. • Create a worksheet and edit it. • Demonstrate how to format a workshop. 	

PROGRAMME: WORD PROCESSING			
Course: Introduction to Computing		Course Code: ICT 101	Contact Hours: 0-0-3
Week	Specific Learning Outcome	Teachers	Resource
10-11	<ul style="list-style-type: none"> iii. Formatting data (decimal places, alpha-numeric) iv. Creating and saving worksheets v. Creating a formula in cells vi. Importing objects vii. Exporting the worksheet viii. Creating and manipulating graphical representations of data ix. Printing 		
12-13	<ul style="list-style-type: none"> a. Demonstrate ability in the competent use of a database package such as MS Access (or equivalent standard). <ul style="list-style-type: none"> i. Drawing tools ii. Text as graphics iii. Creating & saving image files iv. Editing & moving images v. Importing & exporting graphics vi. Windows 'Clipboard' facility vii. Creating & manipulating images (re-sizing etc) viii. Image file standards (JPEG, PCX, GIF etc) ix. Printing 	<ul style="list-style-type: none"> • Load MS Access. • Explain the features and working of the software. • Use students record as example and enter the records in the structure query modify and produce typical report. • Show how to index and sort files in alphabetical order. 	

PROGRAMME: WORD PROCESSING			
Course: Introduction to Computing		Course Code: ICT 101	Contact Hours: 0-0-3
Week	Specific Learning Outcome	Teachers	Resource
14-15	a. Use the Internet to retrieve information. <ul style="list-style-type: none"> i. World Wide Web (WWW) ii. Download information iii. Paste retrieved information into an appropriate application iv. Use e-mail to send and receive messages. v. National and international e-mail vi. E-mail attachments (sending & receiving) 	<ul style="list-style-type: none"> • Show students how to look on to the Internet. • Write and send an email. • Surf the net. 	
<p>Assessment: Coursework 20%; Course test 20%; Practical 10%; Examination 50%.</p> <p>Competency: The student should be expose to understand basic computer programming.</p> <p>References: Chapra, S.C. and Canale, R.P. "Introduction to Computing for Civil Engineers", Mcgrew hil, 1994 Press, W.H., Teukolsky, S.A., Vetterling, W.T. and Fannery, B.P. "Numerical recipes". Cambridge Univ. Press, 1993.</p>			

Visual Basic Practical

PROGRAMME: Visual Basic Practical			
Course: Introduction to Programming Concepts Using Q-Basic		Course Code: ICT 102	Contact Hours 0-0-3 Practical simultaneously
Course Specification: Theoretical Content			
General Objective: To enable student to develop basic programming skills			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 2	1.1 Define programming 1.2 Define Algorithm Outline basic steps in developing algorithm. Write simple algorithm to solve simple problem. 1.3 Explain Flowchart Identify Flowchart symbols. Draw Flowchart of the algorithm in 1.2.2.	<ul style="list-style-type: none"> • Define program and give examples. • Give real-life example relating to the student's trade e.g. Building process, Chair making process. • Draw different Flow chart symbols and explain each. • List different programming languages. • Give the features of HLL and LLL • Give definitions of translators. 	Charts
3 - 5	2.1 Implement programming concept using BASIC. 2.2 State BASIC character set. 2.3 State BASIC variable names. 2.4 Describe variable name formation. 2.5 Form variable names. 2.6 Define identifiers. 2.6 Classify identifiers e.g. string, numeric, real etc. 3.1 Define Q-BASIC expressions 3.2 Explain arithmetic expressions 3.3 Explain relational expressions 3.4 Explain logical expressions 4.1 Q-BASIC Functions 4.2 Explain Functions 4.3 Explain in-built functions 4.4 Explain user defined functions 5.1 Q-Basic syntax. 5.2 Explain READ/ DATA Statements. 5.3 Explain INPUT Statements. 5.4 Explain REMARK Statements. 5.5 Explain PRINT Statements.	<ul style="list-style-type: none"> • List the basic character • Set e.g. Alphabets, digits, special character • Explain how variable names are formed. • Differentiate between identifiers and variable names • Give examples of arithmetic, relational and logical expressions • Give examples of in-built and user defined Functions. • Illustrate the use of the different statements with examples 	

PROGRAMME: Visual Basic Practical			
Course: Introduction to Programming Concepts Using Q-Basic		Course Code: ICT 102	Contact Hours 0-0-3 Practical simultaneously
Course Specification: Theoretical Content			
General Objective: To enable student to develop basic programming skills			
Week	Specific Learning Outcome:	Teachers Activities	Resources
7 – 8 9 - 10	6.1 Introduction to Q-BASIC Environment. 6.2 Explain how to enter the Q-BASIC Editor. 6.3 Explain how to key in programs. 6.4 Explain how to save Q-BASIC programs. 6.5 Explain how to debug Q-BASIC program. 7.1 Simple programs 7.2 Write Simple programs. 7.3 Run the programs. 7.4 Print program result.	<ul style="list-style-type: none"> • Get student to switch on to the Q-BASIC. • Show the student how to enter the Q-BASIC Environment. • Open the Editor. • Instruct the student to SAVE, RUN and DEBUG the program. • PRINT results. 	<ul style="list-style-type: none"> • PCs, Q-BASIC Software • Printer
11 - 12	8.1 Control Statements. 8.2 Explain Control Statements. 8.3 Explain Branching statements. 8.4 Explain IF-THEN-ELSE. 8.5 Explain FOR-NEXT.	<ul style="list-style-type: none"> • Write program to illustrate the use of IF-THEN-ELSE and FOR-NEXT. 	<ul style="list-style-type: none"> • PCs, Q-BASIC Software • Printer
13 - 15	9.1 Write simple programs using the different statement and constructs.	<ul style="list-style-type: none"> • Give the student programming projects embracing all concept that have been taught in their areas of trade. 	
<p>Assessment: Coursework 20%; Course test 20%; Practical 10%; Examination 50%.</p> <p>Competency: The student should be able to use Q basic to write programs for Quantity Survey works.</p> <p>Reference A.J. Smith “Computers and Quantity Surveyors” Macmillan</p>			

Law and Management Courses

Principles of Economics

Course: Principles of Economics		Course Code: QUS 107	Contact Hours: 2-0-0
Course Specification: Theoretical Content			
General Objective 1.0: Understand the existence of scarcity of resources and recognize the need to allocate resources between alternative uses			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 2	1.1 Identify resources in terms of factors of production i.e land, labour and capital 1.2 Evaluate cost in terms of the marginal foregone alternative using transformation curve analysis 1.3 Explain approximate cost from statistical evidence using production 1.4 Calculate the effect on the production possibility curve of changing levels of influencing economic growth from statistical data provided for analysis	<ul style="list-style-type: none"> Define and explain the terminologies Use environment to cite real examples. Use questions and answers techniques. 	<ul style="list-style-type: none"> Chalkboard, classroom, chalk, Duster
General Objective 2.0: Understand the Forces of demand and supply operating in the market economy to determine prices			
Week	Specific Learning Outcome:	Teachers Activities	Resources
3 4 5 6	2.1 Define the functions of demand in terms of income, price of substitutes, price of complements and taste. 2.2 Construct a graph to indicate a demand curve from statistical data provided for examination 2.3 Define elastic, inelastic and unitary price elasticity of demand for good and services 2.4 Define the concept of supply 2.5 Construct a graph to indicate a supply curve from statistical data provided for examination 2.6 Calculate price equilibrium from statistical data involving demand and supply analysis 2.7 Calculate changes in price equilibrium from statistical data involving changes in the conditions of demand and supply	<ul style="list-style-type: none"> Give more definitions of terminologies Give the students more assignments Use relevant examples in the locality to further explain. 	<ul style="list-style-type: none"> Chalkboard, chalk, duster, calculator

Course: Principles of Economics		Course Code: QUS 107	Contact Hours: 2-0-0
Course Specification: Theoretical Content			
	2.8 Calculate the effect of subsidy from the statistical data provided for examination		
General Objective 3.0: Know the production equilibrium of firms in the economy			
Week	Specific Learning Outcome:	Teachers Activities	Resources
7	3.1 Describe the criteria underlying the nature of perfect competition, imperfect competition and monopoly	<ul style="list-style-type: none"> • Explain the concept of competition, monopoly, etc. • Give worked examples. • Give more assignments to students. 	
8	3.2 Calculate the production equilibrium of firm from statistical data provided		
	3.3 Calculate the breakeven point of firm from statistical data provided		
General Objective 4.0: Appreciate the stages of Economic growth with reference to the Nigerian Economy			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9 - 11	4.1 Describe the measurement and uses of national income and products 4.2 Explain main reason for differences in per capital national income 4.3 Describe elementary theory of National Income determination	Ditto	
General Objective 5.0: Appreciate the economics of land as a resources and development of land by developers			
Week	Specific Learning Outcome:	Teachers Activities	Resources
12 - 15	5.1 Define in legal terms "land" as a factor of production 5.2 Evaluate the demand for land by developers 5.3 Explain the aims of public and private developers 5.4 Describe the factors determining the choice and acquisition of site for development	<ul style="list-style-type: none"> • Highlight the importance of land in comparison to other factors of production. 	
	Assessment: Coursework - 20%; Course Test - 20%; Practical - 0%; Examination - 60% Competency: The student should be able to know basic economics of production. Reference: Ivor H. Seeley Macmillan "Building Economics 4 th Edition"; Stephen L.G. "Construction Economics" (in Introduction).		

Principles of Accounts

Course: Principles of Accounts		Course Code: QUS 108	Contact Hours: 1-1-0
Course Specification: Theoretical Content			
General Objective: 1.0 Know the recording of transactions in the books of accounts			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1	1.1 Describe the double entry systems of recording transactions. 1.2 Identify the debit and credit sides of an account entry. 1.3 Prepare double entry recording of transactions. 1.4 Explain the terms and uses of journal, ledger, cash book, etc.	<ul style="list-style-type: none"> • Use real samples to explain. • Use questions and answers techniques. 	<ul style="list-style-type: none"> • Chalkboard • Ledger • Calculator • Accounting machine
General Objective 2.0: Understand the use of General ledger.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
2	2.1 Explain what a ledger is. 2.2 Illustrate the use of a ledger. 2.3 Describe a ledger for information.	Ditto	- do -
General Objective 3.0: Know how to extract a trial balance.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
3 - 4	3.1 Explain the term trial balance. 3.2 Explain the principle of trial balancing. 3.3 Prepare a final balance.	<ul style="list-style-type: none"> • Give more worked examples. • Give assignments to students. 	- do -
General Objective 4.0: Know how to prepare the final Account of a Sole trader.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
5 - 7	4.1 Explain the term Final Account. 4.2 List the components of a Final Account. 4.3 Prepare a Final Account for a Sole trader.	Ditto	- do -
General Objective 5.0: Know how to prepare accounts for a Partnership and/or a Sole trader			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
8	5.1 Prepare the draft account of a partnership. 5.2 Prepare the partnership current accounts and capital accounts.	Ditto	- do -

Course: Principles of Accounts		Course Code: QUS 108	Contact Hours: 1-1-0
Course Specification: Theoretical Content			
General Objective 5.0: Know how to prepare accounts for a Partnership and/or a Sole trader			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
9	5.3 Prepare the appropriation account of a partnership. 5.4 Prepare profit and loss appropriation account of partnership and/or Sole traders business.		- do -
10	5.5 Prepare a Balance sheet for a partnership and/or Sole trader's business. 5.6 Prepare the Bank reconciliatory statements for Sole trader and partnership account.		- do -
General Objective 6.0: Understand the preparation of contract accounts.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
11 - 15	6.1 Explain what an Architect's Certificate means. 6.2 State the uses and importance of Architects Certificate in the execution of a contract. 6.3 Explain how to treat sub-contract work in the accounts. 6.4 State the treatment of plant and machinery purchases for a contract in the account. 6.5 Describe how to apportion overhead to a particular contract. 6.6 Prepare contract accounts for individual contracts. 6.7 Explain how profit on an uncompleted contract is to be treated.	<ul style="list-style-type: none"> • Describe the terms as herein applied. • Give more worked examples. 	
<p>Assessment: Coursework - 20%; Course Test - 20%; Practical - 0%; Examination - 60%.</p> <p>Competency: The student should be able to prepare the final account for a small business enterprise.</p> <p>References:</p> <ol style="list-style-type: none"> 1. A.E. Jenning "Accounting and Finance for Building and Surveying" 2. Alan E. Turner "Building Procurement" Macmillan 			

Principles of Law

Course: Principles of Law		Course Code: QUS 110	Contact Hours: 2-0-0
Course Specification: Theoretical Content			
General Objective 1.0: Know the branches and sources of Law and the various schools of Law			
Week	Specific Learning Outcome	Teachers Activities	Resources
1 2	1.1 State and describe schools of Law i.e.: a. Analytical school. b. Historical school. c. Sociological school. d. Maximum theory of law. e. Natural law school 1.2 State sources of Law i.e. statutory, common law. 1.3 State branches of law i.e. criminal, civil and tort.	<ul style="list-style-type: none"> • Explain the different origins. • Use question and answer techniques. • Give examples from stated cases. 	<ul style="list-style-type: none"> • Chalkboard, classroom <li style="text-align: center;">Ditto
General Objective 2.0: Understand the legislation process and power separation			
Week	Specific Learning Outcome	Teachers Activities	Resources
3 4	2.1 Explain the doctrine of separation of powers, its advantages and disadvantages 2.2 State the functions of different arms of government	<ul style="list-style-type: none"> • Use question and answer technique • Use present arrangement to illustrate 	Ditto
General Objective 3.0: Know the general principles of constitutional and administrative Law			
Week	Specific Learning Outcome	Teachers Activities	Resources
5 - 7	3.1 Define the term “constitution” 3.2 Describe and distinguish the different kinds of constitutions i.e a. Written as opposed to unwritten constitution b. Flexible as opposed to rigid constitutions c. Federal as opposed to unitary constitutions 3.3 Describe and distinguish between: a. Presidential system of government b. Parliamentary (cabinet, west minister system of government)	<ul style="list-style-type: none"> • Give examples to illustrate the term • Give exercises and review assignment with students 	Ditto

Course: Principles of Law		Course Code: QUS 110	Contact Hours: 2-0-0
Course Specification: Theoretical Content			
General Objective 4.0 Understand the statutory Acts, Edicts, Decrees, Bye-Laws etc.			
Week	Specific Learning Outcome	Teachers Activities	Resources
8 - 10	<p>4.1 Define the following:</p> <ul style="list-style-type: none"> a. Statutory act b. Decrees c. Edicts d. Bye-laws e. Regulations <p>4.2 Explain the importance of each of them, their promulgation process and their jurisdiction.</p>		
General Objective 5.0: Understand the simple Building regulations and planning Laws.			
Week	Specific Learning Outcome	Teachers Activities	Resources
11 - 15	<p>5.1 State the various Acts and statutes applicable to the erection of buildings.</p> <p>5.2 Explain the sources of plans and Hierarchy of plans.</p>	<ul style="list-style-type: none"> • Give examples to illustrate. • Use life projects to illustrate different plans. 	Ditto
<p>Assessment: Coursework - 20%; Course Test - 20%; Practical - 0%; Examination - 60%</p> <p>Competency: The student should be able to have the basic knowledge of law and building regulations.</p> <p>References:</p> <ol style="list-style-type: none"> 1. I.E. Sagay "Nigerian Law of Control" Spectrum Law series 2. Kodilinye and Aluko "Nigerian Law of Torts" Spectrum Law series 			

Principles of Management

Course: Principles of Management		Course Code: QUS 204	Contact Hours: 2-0-0
Course Specification: Theoretical Content			
General Objective: 1.0 Understand management and the management process and functions such as forecasting, planning, organizing, motivating, controlling etc.			
Week	Specific Learning Outcome	Teachers Activities	Resources
1 - 4	<p>1.1 Explain the meaning of management and management functions of forecasting, planning, organizing, motivating, controlling, communication, leadership, decision-making and coordinating.</p> <p>1.2 Explain the following areas of relevance to the construction industry in the management process:</p> <ol style="list-style-type: none"> a. General manager b. Finance c. Design d. Development e. Marketing f. Production g. Maintenance h. Personnel i. Office j. Purchasing <p>1.3 Explain the major process of management as outlined by Fayol and others.</p>	<ul style="list-style-type: none"> • Explain using relevant examples. • Use question and answer method to test understanding. • Give assignment. • Explain using relevant examples. • Test students understanding through question and answer session. • Give assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.
General Objective 2.0: Understand the contribution of pioneers and fathers of management to management process and development.			
Week	Specific Learning Outcome	Teachers Activities	Resources
5 - 7	<p>2.1 Explain the specific contributions of:</p> <ol style="list-style-type: none"> a. Charles Babbage (1792-1871) b. Henri Fayol (1841-1925) c. Oliver Sheldon (1804 - 1951) d. Mary Parker Follot (1864-1933) e. Fredrick Winslow Taylor (1856-1915) 	Ditto	Ditto

Course: Principles of Management		Course Code: QUS 204	Contact Hours: 2-0-0
Course Specification: Theoretical Content			
General Objective 3.0: Appreciate span of control, delegation accountability and organization principles.			
Week	Specific Learning Outcome	Teachers Activities	Resources
8 - 10	3.1 Define span of control. 3.2 Demonstrate how span of control affects site organization. 3.3 Explain delegation, assignment of responsibility and accountability and how they affect site organization. 3.4 Define and explain organizational principles of unit of command scalar principle.	<ul style="list-style-type: none"> • Explain using relevant examples. • Use question and answer method to test understanding. • Give assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.
General Objective 4.0: Appreciate the value of effective communications within the construction industry.			
Week	Specific Learning Outcome	Teachers Activities	Resources
11 - 12	4.1 Explain the value of effective communication. 4.2 Explain the various means of communication with particular reference to construction site. 4.3 Explain line communication with particular reference to the industrial organizational set-up.	Ditto	Ditto
General Objective 5.0: Understand the various types of business organizations and their various features and characteristics.			
Week	Specific Learning Outcome	Teachers Activities	Resources
13 - 15	5.1 Explain the features and characteristics of one-man business, partnership and company.	<ul style="list-style-type: none"> • Explain using relevant examples. • Use question and answer method to test understanding. • Give assignment. 	<ul style="list-style-type: none"> • Chalkboard. Chalk, duster
<p>Assessment: Coursework - 20%; Course Test - 20%; Practical - 0%; Examination - 60%;</p> <p>Competency: The student should be able to know basic management principles.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Cole G.A. "Management Theory and Practice" 5th Edition lets Educational 2. Fellows R. "Construction Management in Practice" 1983 Edition 			

Mechanical Engineering Courses

MEC 112 TECHNICAL DRAWING YI/1ST SEM 0/0/4 Hrs/WK

OUTCOMES:

- On completion of this module, the student should be able to:
- Know different drawing instruments, equipment and materials used in technical drawing.
 - Know graphical communication.
 - Know the construction of simple geometrical figures and shapes.
 - Know Isometric and Oblique Projections.
 - Know single orthographic projections.
 - Understand the interactions of regular solids.

Technical Drawing

PROGRAMME: NATIONAL DIPLOMA IN MECHANICAL ENGINEERING			
COURSE: TECHNICAL DRAWING		Course Code: MEC 112	Contact Hours: 60 hrs.
Course Specification: Theoretical Content			
General Objective 1.0: Know different drawing instruments, equipment and materials used in technical drawing.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1	1.1 Identify the different types of drawing instruments, equipment and materials. 1.2 Outline the uses of the various instruments, equipment and materials. 1.3 State the precautions necessary to preserve items 1.1 above. 1.4 Use each of the items in 1.1 above. 1.5 Maintain the various instruments and equipment.	Present the students all drawing instruments: Drawing set T-Square Drawing board Set squares Types of pencils (H to B) Show to demonstrate and explain the uses of all of the above.	Black board ruler (1m) Black board Tee-Square Black board compass Blackboard protector Adjustable set-square 60 set square, 45 set square French curve set, Templates Duster, Chalk Complete drawing table

PROGRAMME: NATIONAL DIPLOMA IN MECHANICAL ENGINEERING			
COURSE: TECHNICAL DRAWING		Course Code: MEC 112	Contact Hours: 60 hrs.
Course Specification: Theoretical Content			
General Objective 2.0: Know Graphical Communication			
Week	Specific Learning Outcome:	Teachers Activities	Resources
2	2.1 Explain graphics and the different types of graphic present 2.2 Illustrate the various convention present in graphical productions of construction lines, finished lines, hidden and overhead details projections, centre lines, break lines, dimensioning of plane, elevation and sections of objects. 2.3 Layout of drawing sheets with the following (a) Margins (b) Title block etc. 2.4 State the various standards of drawing sheets. 2.5 Print letters and figures of various forms and characters. 2.6 Illustrate conventional signs, symbols and appropriate lettering characters.	Ask the students to illustrate in a drawing the various types of lines based on BS 308 1972 Part 2. and assess. Ask the students to set drawing area on A1 paper with a title block and the boarder lines and assess. Ask students to illustrate technical lettering in capital and small letters, using, free hand and using letter stencils and assess. Ask students to identify the various standard sheets Ao-A4 and assess Ask students to draw conventional signs and symbols and assess the students	-do -
General Objective: 3.0 Know the construction of simple geometrical figures and shapes.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
3 - 4	3.1 Explain the purpose of geometrical construction in drawing parallel. 3.2 Construct parallel and perpendicular lines 3.3 Construct and bisect lines, angles and areas 3.4 Divide a straight line into given number of equal parts. 3.5 Identify polygons (regular or irregular)	Ask students to illustrate the construction of simple geometrical figures and shapes and assess Ask students to construct parallel and perpendicular lines and assess Ask students to construct and bisect lines, angles and areas and assess Ask students to divide a straight line into a graph number of equal parts using the compasses and assess	

PROGRAMME: NATIONAL DIPLOMA IN MECHANICAL ENGINEERING			
COURSE: TECHNICAL DRAWING		Course Code: MEC 112	Contact Hours: 60 hrs.
Course Specification: Theoretical Content			
General Objective: 3.0 Know the construction of simple geometrical figures and shapes.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
3 - 4	<p>3.6 Construct regular polygons with N sides in a given circle, given (a) distance across flats (b) distance across corners</p> <p>3.7 Define a circle</p> <p>3.8 Explain the properties of a circle, e.g. radius, diameter, normal, tangent, circumference etc.</p>	<p>Ask students to differentiate between regular and irregular polygons and assess</p> <p>Ask students to construct regular polygon with N side and assess.</p> <p>Ask students to differentiate between regular and irregular polygons and assess</p> <p>Ask students to construct regular polygon with N-sides and assess the students.</p>	
5	<p>3.9 Carry out simple geometrical constructions on circles e.g. (a) diameter of a circle of a circle of a given circumference. (b) the circumference to a circle of a given diameter (c) a circle to pass through 3 points (d) a circle to pass through 2 points and touch a given line (e) a circle to touch a given smaller circle and a given line (f) tangents to circles at various points (g) an arc of radius tangent to two lines at an angle to less than and more than 90 (h) an arc externally tangent to two circles (i) inscribing and circumscribing circles</p>	<p>Ask students to explain the various properties of a circle and assess</p> <p>Ask students to differentiate the different methods of constructing ellipses and assess</p> <p>Ask students to construct an ellipse using the various methods and assess</p>	- do -
6	<p>3.10 Define an ellipse</p> <p>3.11 Construct ellipse by using (a) trammel method (b) concentric circle method.</p> <p>3.12 Explain the following draughting techniques (a) Projection method (b) Measurement method (c) Transposition method.</p>	<p>Ask students to explain the various draughting techniques and assess</p> <p>Ask students to construct plane and diagonal scales and assess.</p>	

PROGRAMME: NATIONAL DIPLOMA IN MECHANICAL ENGINEERING			
COURSE: TECHNICAL DRAWING		Course Code: MEC 112	Contact Hours: 60 hrs.
Course Specification: Theoretical Content			
General Objective: 3.0 Know the construction of simple geometrical figures and shapes.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
6	3.13 Construct plane scales and diagonal scales, using appropriate instruments.		
General Objective 4.0: Know Isometric and Oblique Projections.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
7 - 10	4.1 Explain isometric and oblique projections. 4.2 Draw a square in isometric and oblique forms 4.3 Draw a circle in Isometric and oblique forms 4.4 Draw an ellipse in Isometric and oblique forms. 4.5 Draw a polygon with a minimum of eight sides in Isometric and oblique forms 4.6 Dimension holes, circles, arcs and angles correctly on isometric and obliques. 4.7 Use appropriate convention symbols and abbreviations.	Ask students to differentiate between Isometric and oblique projections and assess Ask students to construct a square and circle in isometric and oblique projections and assess Ask students to draw a polygon in isometric and oblique projections and assess Ask students to construct and dimension holes circles, arcs and angles in isometric and oblique projection and label with appropriate conventional symbols and abbreviations and assess	Recommended textbooks. Chalkboard, dust, chalk, lecture notes, drawing sets
General Objective 5.0: Know single orthographic projections.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
11 - 12	5.1 Explain the principle of orthographic projection. 5.2 Illustrate the principle planes of projection (a) Vertical plane (b) Horizontal plane. 5.3 Explain why the first and third angles are used and the second and fourth angles not used.	Ask students to differentiate between first and third angle orthographic projection and assess Ask students to explain the vertical and horizontal planes in orthographic projection and assess	Recommended textbooks. Chalkboard, dust, chalk, lecture notes, drawing sets

PROGRAMME: NATIONAL DIPLOMA IN MECHANICAL ENGINEERING			
COURSE: TECHNICAL DRAWING		Course Code: MEC 112	Contact Hours: 60 hrs.
Course Specification: Theoretical Content			
General Objective 5.0: Know single orthographic projections.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
11 - 12	5.4 Project views of three-dimensional objects on to the basic planes of projection in both first and third angle to obtain (a) the front view or elevation (b) the top view or plan.	Ask students to construct orthographic projections of simple objects in first and third angle orthographic projections and assess	
General Objective 6.0: Understand the intersections of regular solids.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
13 - 15	6.1 Explain interpretation or intersections of solids. Draw the lines of intersections of the following regular solids and planes in both first and third angles. Two square-prisms meeting at right angles. Two dissimilar square prisms meeting at an angle. Two dissimilar square prisms meeting to an angle A hexagonal prism meeting a square prism at right angles. Two dissimilar cylinders meeting at an angle. Two dissimilar cylinders meeting at right angle, their centres not being in the same vertical plane.	Ask students to give examples of intersection of solids Ask students to construct: Two square-prisms meeting at right angles Two dissimilar square prisms merely at “ Two dissimilar square prisms meeting 60 An hexagonal prism meeting a square prism Two dissimilar cylinders meeting at an angle Two dissimilar cylinders meeting at right angle, then centres at long in the same vertical place. As in 6.2	Recommended textbooks. Chalkboard, dust, chalk, lecture notes, drawing sets
ASSESSMENT: The continuous assessments, tests and quizzes will be awarded 40%, while the remaining 60% will be for the end of the Semester Examination Score.			

Building Services

Course: Building Services		Course Code: QUS 206	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Understand the environmental requirements and choice of methods of fire protection			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1 - 3	1.1 Describe and distinguish fire rating for the building materials. 1.2 State fire regulations as applied to building. 1.3 Describe various methods of fire protection and precautions. 1.4 Describe various fire fighting equipment both manual and mechanical.	<ul style="list-style-type: none"> • Use relevant examples to explain. • Give student assignments. • Use relevant examples to explain. • Take students to a fire service station. • Explain types need in the workshop. • Give students assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, building regulations. • Chalkboard, chalk, duster.
General Objective 2.0: Understand the principle of Electricity and magnetism			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
4	2.1 Explain simple principles of electro-magnetism. 2.2 Work examples of simple electrical calculation and explain the unit of measurement of electricity.	<ul style="list-style-type: none"> • Define electro-magnetism. • Use relevant worked examples to explain. • Give students other calculations to make. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculator.
General Objective 3.0 Appreciate the principles of Electricity generation.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
5	3.1 Describe various methods of electricity generation. 3.2 Explain electricity transmission and distribution system.	<ul style="list-style-type: none"> • Explain using relevant examples • Give assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.

Course: Building Services		Course Code: QUS 206	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 4.0: Understand simple electrical installation and layout with conventional signs.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
6	<p>4.1 Differentiate between typical single phase and 3-phase system</p> <p>4.2 Identify items of equipment and space required by the Electricity Board (NEPA) at the intake position</p>	<ul style="list-style-type: none"> • Use relevant examples to explain. • Show students the equipment in an existing building. • Use question and answer technique to verify understanding. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, IEE regulation.
7 - 8	<p>4.3 Identify the need for correct cable sizing and the protection of circuit in accordance with IEE regulations.</p> <p>4.4 Identify the consumers control gear box required at the intake position.</p> <p>4.5 Identify the electrical accessories used in a typical domestic installation.</p> <p>4.6 Identify the main types and sizes of cable used for domestic electrical installation.</p> <p>4.7 Explain the principles of the ring main wiring system and an open system.</p> <p>4.8 Sketch and explain a typical domestic electrical installation (layout).</p>	<ul style="list-style-type: none"> • Use relevant examples to explain. • Use model of a typical domestic electrical installation. • Give students assignments. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster. Charts model.
General Objective 5.0: Understand the principles for constructing simple drainage systems.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
9 - 10	<p>5.1 Distinguish between separation and combined drainage system and draw annotated line diagrams of these systems.</p> <p>5.2 State purpose of highway drains.</p> <p>5.3 Sketch and describe the construction of a typical highway drainage system.</p> <p>5.4 Sketch and describe methods of laying rigid and flexible drain pipes.</p> <p>5.5 Sketch and describe simple manhole construction.</p>	<ul style="list-style-type: none"> • Explain using relevant examples. • Demonstrate construction of manhole. • Give the students practical assignment. 	<ul style="list-style-type: none"> • Chalkboard chalk, duster, cement, sand, aggregate, charts.

Course: Building Services		Course Code: QUS 206	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 6.0: Understand the principles of hot and cold water installations.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
11-12	<p>6.1 Describe sources of water and method of water treatments.</p> <p>6.2 Describe direct and indirect hot and cold water systems and explain how they function.</p> <p>6.3 Sketch typical pipe work layouts indicating components and controls.</p> <p>6.4 Describe the purpose of storage.</p> <p>6.5 Describe the functions and operation of indirect hot water storage cylinders.</p> <p>6.6 Identify fittings required for pipe work installations.</p>	<ul style="list-style-type: none"> • Use relevant examples to explain. • Give students assignments. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, charts, models.
General Objective 7.0: Understand the principal factor involved in selection of sanitary fittings			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
13-14	<p>7.1 Describe the sanitary fittings for typical domestic installations.</p> <p>7.2 Sketch waste and water connections to these fittings.</p> <p>7.3 Sketch the single vent system above ground drainage and describe the operation.</p> <p>7.4 List the provision to be made during construction to accommodate sanitary fittings and services.</p> <p>7.5 Describe builders work in connection with the works.</p>	<ul style="list-style-type: none"> • Use relevant examples to explain. • Show sanitary fittings in existing building. • Give assignment. 	Ditto
General Objective 8.0: Know building regulations, standards and specifications.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
15	<p>8.1 Explain the importance of building regulations in building works</p> <p>8.2 Differentiate between standards, specifications and code of practice</p>	<ul style="list-style-type: none"> • Explain using relevant examples. 	Ditto

Course: Building Services	Course Code: QUS 206	Contact Hours: 1-0-2
Course Specification: Theoretical Content		
	<p>Assessment: Coursework - 20%; Course Test - 20%; Practical - 20%; Examination - 40%.</p> <p>Competency: The student should be exposed to the knowledge of services required in and around the building.</p> <p>References: I. F. Tall "Essential Building Services and Equipment"</p>	

Quantity Surveying Courses

Introduction to Measurement

Course: Introduction to Measurement.		Course Code: QUS 101	Contact Hours: 1-1-0
Course Specification: Theoretical Content			
General Objective 1.0: Understand the History of Quantity Surveying			
Week	Specific Learning Outcomes	Teachers Activities	Resources
1-3	1.1 Explain the history of the profession from its root in Britain. 1.2 Explain the history of the profession in Nigeria. 1.3 State the various professional bodies in the world. 1.4 State the body regulating the practice of the profession in Nigeria.	<ul style="list-style-type: none"> • Discuss the evolution of the profession of Quantity Surveying. • Explain the relation of the Nigerian construction industry to the professional bodies like NIQS, QSRBN, etc. 	
General Objective 2.0: Understand the duties and functions of a quantity Surveyors.			
Week	Specific Learning Outcomes	Teachers Activities	Resources
4-5	2.1 Summarize the duties which a Quantity Surveyor is expected to perform. 2.2 Identify the duties of other professionals involved in building project.	<ul style="list-style-type: none"> • Explain with relevant examples. 	<ul style="list-style-type: none"> • Chalkboard, fly chart, marker, chalk.
General Objective 3.0: Know standard method of measurement of building works.			
Week	Specific Learning Outcomes	Teachers Activities	Resources
6-9	3.1 Identify various works section heading and their unit of measurement. 3.2 Apply the standard method of measurement of building works. 3.3 Determine where and when to use the various units of measurement.	<ul style="list-style-type: none"> • Explain using SMM. • Explain the various items. 	<ul style="list-style-type: none"> • SMM, Chalkboard, Fly Chart, Markers

Course: Introduction to Measurement.		Course Code: QUS 101	Contact Hours: 1-1-0
Course Specification: Theoretical Content			
General Objective 4.0: Understand in detail the knowledge of measurement.			
Week	Specific Learning Outcomes	Teachers Activities	Resources
10-15	<p>4.1 Calculate the volume of various shapes.</p> <p>4.2 Illustrate how they are related to building.</p> <p>4.3 Calculate the areas of various shapes.</p> <p>4.4 Explain how they are related to building.</p> <p>4.5 Calculate the centre line girth of building.</p> <p>4.6 Explain the importance of centre line girth in measurement.</p>	<ul style="list-style-type: none"> • Draw the various shapes. • Revise the various mathematical formula for calculating volume and areas (mensuration). • Explain how to measure girth. 	<ul style="list-style-type: none"> • Calculator • Scale rule • Drawings especially of foundation. • Chalks • Take-off sheet
<p>Assessment: Coursework - 20%; Course Test - 20%; Practical - 0%; Examination - 60%.</p> <p>Competence: The student should be familiar with the basic principles of measurement and smm.</p> <p>References: I.H. Seeley "Building Quantities Explained" 3rd Edition</p>			

Basic Engineering Science

Course: Basic Engineering Science		Course Code: QUS 103	Contact Hours: 2-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Understand the principles in Engineering Science.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 2	1.1 Differentiate between a scalar and vector quantity. 1.2 State the force in a vector quantity. 1.3 Describe stable, unstable, and neutral equilibrium. 1.4 Define the moment of a force about a point. 1.5 State the principle of moments. 1.6 Solve simple beam problems. 1.7 Define centre of gravity. 1.8 Show with the aid of sketches, the position of the centre of gravity of Thin uniform rod. Rectangular lamina Circular lamina. 1.9 Determine graphically the resultant of two or more concurrent and non-concurrent co-planner forces.	<ul style="list-style-type: none"> • Explain to student with worked example. • Give student some questions to practice with. 	<ul style="list-style-type: none"> • Calculator • Chalkboard • Writing materials • Scale rule • Graph sheets • razer. • Duster
General Objective 2.0: Appreciate the effects of forces on materials.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
3 4	2.1 Define stress and strain. 2.2 Define young's modulus of elasticity. 2.3 Differentiate between compressive, tensile and shear forces. 2.4 Define working stress. 2.5 Define tensile strength. 2.6 Explain the need for a factor of safety. 2.7 Solve simple problems relating to 2.1 to 2.6. 2.8 Define modulus of rigidity. 2.9 Define bulk modulus. 2.10 Define Poisson's ratio. 2.11 Explain the relationship between the elastic moments.	<ul style="list-style-type: none"> • Explain to student the effects of forces on materials. • Work some examples with the students. • Give the student some questions to work in the class. • Give student assignment to do on this. 	<ul style="list-style-type: none"> • Calculator • Chalkboard • Writing materials • Scale rule • Graph sheets

Course: Basic Engineering Science		Course Code: QUS 103	Contact Hours: 2-0-2
Course Specification: Theoretical Content			
General Objective 2.0: Appreciate the effects of forces on materials.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5	<p>2.12 Recognize the behaviour of various forms of structure under the action of different loadings and end restraints.</p> <p>2.13 Differentiate between the actions of</p> <ul style="list-style-type: none"> (a) Compression (b) Tension (c) Bending (d) Shear (e) Torsion <p>2.14 Identify configuration of loading which could induce each of the actions, stated in 2.13 in relation to the following:</p> <ul style="list-style-type: none"> a. Horizontal straight cantilever b. Horizontal supported beam c. Vertical straight column <p>2.15 Sketch deflected forms associated with configuration 2.14.</p> <p>2.16 Indicate for each deflected form in 2.15 which areas are in tension.</p>		
General Objective 3.0: Understand atomic structure, chemical reactions and nature and formation of crystals.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
6 7	<p>3.1 Describe the atom as the basic building block of matter.</p> <p>3.2 Describe molecule as an independent group of atoms bonded together.</p> <p>3.3 Explain the terms elements and compounds in terms of atomic composition and distinguish compounds from mixtures.</p> <p>3.4 Give examples of each of the following:-</p> <ul style="list-style-type: none"> a. Elements b. Compounds c. Mixtures 	<ul style="list-style-type: none"> • Explain the atomic structure chemical reactions etc. • Give relevant examples 	<ul style="list-style-type: none"> • Chalkboard • Writing materials • Chalk,

Course: Basic Engineering Science		Course Code: QUS 103	Contact Hours: 2-0-2
Course Specification: Theoretical Content			
General Objective 3.0: Understand atomic structure, chemical reactions and nature and formation of crystals.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
6 7	<p>3.5 Define a solution, a suspension and solubility.</p> <p>3.6 List common factors influencing solubility of a solid in a liquid.</p> <p>3.7 Define a saturated solution</p> <p>3.8 Describe the shape of crystals</p> <p>3.9 Describe the process of crystallization from a solution.</p> <p>3.10 Describe metals as polycrystalline substances.</p> <p>3.11 Explain how alloys can be solid solutions.</p> <p>3.12 Describe an oxide or a compound of an element and oxygen.</p>	<ul style="list-style-type: none"> • Explain the atomic structure chemical reactions etc. • Give relevant examples 	<ul style="list-style-type: none"> • Chalkboard • Writing materials • Chalk,
8	<p>3.13 Describe the damage done by rusting.</p> <p>3.14 Explain the effect of the damage done by rusting.</p> <p>3.15 Describe acidity/alkalinity by means of indicators.</p> <p>3.16 Describe a base as a substance that removes the acidic properties of acids.</p> <p>3.17 Describe an alkali as a soluble base, which yields hydrogen ions.</p> <p>3.18 Describe chemical reactions as interactions between substances, which involve a re-arrangement of atoms.</p> <p>3.19 Describe an acid as a compound, which yields hydrogen ions.</p> <p>3.20 Describe a chemical equation as representing a re-arrangement of elements.</p>		

Course: Basic Engineering Science		Course Code: QUS 103	Contact Hours: 2-0-2
Course Specification: Theoretical Content			
General Objective 4.0: Appreciate the factors influencing the causes of dampness in building and relates them to subsequent defect in materials			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9 10 11 12 13 14 15	4.1 Define cohesion and adhesive. 4.2 Explain surface tension as a cohesive force. 4.3 Explain capillarity in terms of cohesive forces. 4.4 Identify practical situation in construction where capillarity occurs. 4.5 Differentiate between bulk density and solid density. 4.6 Define porosity in the terms of bulk density and solid density. 4.7 Relate porosity to the strength and weathering performance of building materials. 4.8 State that dampness is involved in the deterioration of the majority of building materials. 4.9 Explain measures used to counteract moisture penetration in buildings. 4.10 Derive Bernoulli's equation. 4.11 Solve simple problems using Bernoulli's equation and ignoring friction. 4.12 Relate Bernoulli's equation to the flow of a fluid through a venturimeter. 4.13 Solve simple problems involving the venturimeter. 4.14 Solve problems with formula: $h_f = \frac{FLV^2}{2\delta D} \text{ and } V = c (RS)^{0.5}$ 4.15 Solve simple problems involving flow of water through pipes of uniform cross section. 4.16 Solve simple problems involving flow of water through one channel with rectangular cross-section.	<ul style="list-style-type: none"> • Explain the various terms giving relevant examples. • Work examples for student to understand. • Give student example to practice with.. 	<ul style="list-style-type: none"> • Calculator • Scale rule • Writing material • Chalk • Chalkboard

Course: Basic Engineering Science	Course Code: QUS 103	Contact Hours: 2-0-2
Course Specification: Theoretical Content		
	<p>Assessment: Course work - 20%; Course Test - 20%; Practical - 20%; Examination - 40%.</p> <p>Competency: The student should be able to know the basic principles of building science, its characteristics and application in the construction industry.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Elliot, J. "Building Science and Materials" 2. Timoshenko S.P. "Theory of Structural Engineering" 	

Measurement of Building Works

Course: Measurement of Building Works		Course Code: QUS 102	Contact Hours: 2-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Have knowledge on the measurement of the blockwall, roof construction and roof covering, doors and windows, finishes, painting and decorating.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1-2	a. Block wall	<ul style="list-style-type: none"> • Explain relevant clauses in the SMM. • Use drawings to do example for the student. 	<ul style="list-style-type: none"> • Chalk board • SMM • Calculators • Scale rule • Drawing off sheets • Pencil, marker
3-5	b. Roof Construction and Covering	<ul style="list-style-type: none"> • Explain relevant clauses in the SMM. • Use drawings to do example for the student. 	<ul style="list-style-type: none"> • Chalk board • SMM • Calculators • Scale rule • Drawing off sheets • Pencil, marker
6-7	c. Doors	<ul style="list-style-type: none"> • Explain relevant clauses in the SMM. • Use drawings to do example for the student 	<ul style="list-style-type: none"> • Chalk board • SMM • Calculators • Scale rule • Drawing off sheets • Pencil, marker
8-9	d. Windows	<ul style="list-style-type: none"> • Explain relevant clauses in the SMM. • Use drawings to do example for the student. 	<ul style="list-style-type: none"> • Chalk board • SMM • Calculators • Scale rule • Drawing off sheets • Pencil, marker
10-11	e. Finishes	<ul style="list-style-type: none"> • Explain relevant clauses in the SMM. • Use drawings to do example for the student. 	<ul style="list-style-type: none"> • Chalk board • SMM • Calculators • Scale rule • Drawing off sheets • Pencil, marker

Course: Measurement of Building Works		Course Code: QUS 102	Contact Hours: 2-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Have knowledge on the measurement of the blockwall, roof construction and roof covering, doors and windows, finishes, painting and decorating.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
12	f. Painting and Decorating	<ul style="list-style-type: none"> • Explain relevant clauses in the SMM. • Use drawings to do example for the student 	<ul style="list-style-type: none"> • Chalk board • SMM • Calculators • Scale rule • Drawing off sheets • Pencil, marker
<p>Assessment: Course work - 20%; Course Test - 20%; Practical - 20%; Examination - 40%</p> <p>Competency: The student should be able to know the basic measurement of building elements using the standard method of measurement.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Ivor H. Seeley and Roger Winfield "Building Quantities Explained" 5th Edition 2. T.C. Onoroh "Principles of Measurement of Buildings" volume one 			

Principles of Engineering Measurement

Course: Principles of Engineering Measurement		Course Code: QUS 202	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Understand the scope of Engineering Works			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 4	<p>Explain the various constituents of civil Engineering works including Earth Works</p> <p>Explain the various aspects of electrical Installation</p> <p>Explain the various aspects and constituents of Mechanical and heavy Engineering</p>	<p>Explain the basic principle in perspective drawing.</p> <p>Use such explanations to draw/construct various perspective shapes.</p>	<p>Chalkboard, chalk, duster, protractor, square, pair of compasses, ruler, sample materials,</p>
General Objective 2.0: Know materials used in Engineering Works			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5 - 8	<p>Mention the materials in use</p> <p>Describe briefly the materials in general use, Materials for filling and explosives</p>	- do -	- do -
General Objective 3.0: Understand general Principles of measurement of Engineering Works			
Week	Specific Learning Outcome:	Teachers Activities	Resources
9 - 15	<p>Explain general principles of Engineering measurement using standard methods of measurement including work classification, coding and numbering of items, preparation of bills of quantities</p> <p>Explain principles of methods related charges, measurement of plant and machinery</p> <p>Explain SMM for civil Engineering and Industrial Engineering Contracts</p>	<p>Use question and answer technique to test understanding</p> <p>Give assignments</p> <p>Assess the students</p>	<p>Chalkboard, CESMM, IESMM, Engineering drawings, sample bills of quantities, taking off sheets, billing sheets</p>

Course: Principles of Engineering Measurement		Course Code: QUS 202	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
1 - 14	PRACTICAL CONTENT		
	Identify the materials in general use and materials for filling and explosives Understand general principles of measurement of Engineering Works Perform measurement of Engineering Works using CESMM, IESMM for proper classification, coding and numbering of items Prepare bills of quantities	Give samples Supervise works Give assignments Assess the students	Filling materials, Engineering drawings, CESMM, IESMM, Chalkboard, dusters, calculator, Scale rule
<p>Assessment: Course work - 10%, Course Test - 10%; Practical - 40%; Examination - 40%</p> <p>Competency: on completing, the student should be able to reproduce drawings</p> <p>References: Ivor H. Seeley, "Civil Engineering Quantities 5th Edition", Macmillan Publishers</p>			

Properties of Materials

Course: Properties of Materials		Course Code: QUS 104	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Identify the composition and principal properties of Building Materials and Appreciate factors affecting their deterioration in use			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 - 4	1.1 Differentiate between hard and soft wood in terms of cell structure. 1.2 Differentiate between heartwood and sap wood. 1.3 State the conditions which may lead to fungal attack on timber in a structure. 1.4 Differentiate between wet and dry rot. 1.5 State how fungal attack may be prevented. 1.6 State how fungal attack may be treated. 1.7 Identify insect attack on timber. 1.8 State how insect attack may be prevented. 1.9 State how insect attack may be treated.	<ul style="list-style-type: none"> • Explain thoroughly timber, its characteristics, uses and problems. • Give specific examples to students. 	<ul style="list-style-type: none"> • Chalkboard • Chalk • Writing materials
	1.10 List the four basic components of ordinary Portland cement as calcium, carbonate, silica, alumina and iron oxide. 1.11 State the characteristics of the four basic compound. 1.12 State how the variation in the proportion of basic compounds produces cements with different properties. 1.13 List the various types of cement. 1.14 Indicate the approximate percentage of the four basic compounds in Portland cement.	<ul style="list-style-type: none"> • Explain in detail the types and characteristics of the various cements. • State examples of the uses etc. 	<ul style="list-style-type: none"> • Chalk Board • Chalk • Writing materials
5 - 7	1.15 State examples of the uses of the various types of cement. 1.16 Explain the setting and hardening processes of cement with respect to ambient temperature, heat of hydration, impurities and curing. 1.17 State the main constituent of high alumina cement. 1.18 State the uses and limitations of high alumina in cement.		

Course: Properties of Materials		Course Code: QUS 104	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Identify the composition and principal properties of Building Materials and Appreciate factors affecting their deterioration in use			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5 - 7	1.19 Define coarse, fine and all-in aggregates in accordance with the relevant British Standards.		
	1.20 Distinguish between light weight, normal, dense and heavy aggregates, giving examples of use. 1.21 State two examples each of the above type of aggregates. 1.22 Interpret results obtained from a B.S sieve test. 1.23 Compare results of sieve analysis with standard grading curve. 1.24 Relate the grading of aggregates to the voids in a hardened concrete. 1.25 Interpret the results of B.S field settling test on aggregates. 1.26 Interpret the results of billing test on aggregate. 1.27 Interpret the importance of the moisture content of aggregate.	• Explain the types of aggregates with relevant examples.	• Chalkboard • Chalk • Writing materials
8 - 10	1.28 List the constituents of ordinary dense concrete as cement, fine aggregate, coarse aggregate and water. 1.29 Define water-cement ratio. 1.30 Relate surface texture and shape of aggregate to workability. 1.31 Relate water-cement ratio to workability. 1.32 Relate aggregate cement ratio to workability. 1.33 Relate aggregate cement ratio and workability to strength. 1.34 Relate water-cement ratio and workability to strength. 1.35 Explain drying shrinkage moisture movement in hardened concrete. 1.36 Explain sulphate attack on hardened concrete.	• Explain the constituents of the concrete.	• Chalkboard • Chalk • Writing materials

Course: Properties of Materials		Course Code: QUS 104	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Identify the composition and principal properties of Building Materials and Appreciate factors affecting their deterioration in use			
Week	Specific Learning Outcome:	Teachers Activities	Resources
8 - 10	1.37 Explain the implication and limitation of the destructive compression test on hardened concrete. 1.38 Explain the effect of concreting in cold or hot weather and the necessary precautions to be taken.	• Explain the constituents of the concrete.	• Chalkboard • Chalk • Writing materials
	1.39 Describe the different methods of finishing concrete. 1.40 Distinguish with respect to strength and durability between clay; and calcium silicate brick; facings, common and engineering bricks, solid perforated and frog bricks. 1.41 Identify results of B.S strength, water absorption and soluble salt content tests on bricks. 1.42 State common manufacturing defects in bricks and blocks. 1.43 Distinguish with respect to strength and durability between solid, hollow and cellular concrete blocks.	• Explain the constituent of bricks and blocks to students. • Give several examples and types.	• Chalkboard • Chalk • Writing materials
11	1.44 List the B.S classes of gypsum plaster. 1.45 Describe the different classes in relation to their additives. 1.46 Describe the different classes in relation to their water content. 1.47 List the different rates of set of the different plasters. 1.48 List the three main constituents of a painting system as primer under coat and top coat. 1.49 Identify the basic constituent of an oil plant. 1.50 Identify the basic constituent of an emulsion paint. 1.51 State the functions of the constituents of paint.	• Explain - Ditto	Ditto

Course: Properties of Materials		Course Code: QUS 104	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Identify the composition and principal properties of Building Materials and Appreciate factors affecting their deterioration in use			
Week	Specific Learning Outcome:	Teachers Activities	Resources
	1.52 Describe the physical processes involved in the drying of paints. 1.53 State the reasons for paint application. 1.54 Identify the main failures of paint films. 1.55 Identify the main causes of failure of paint films.	• Explain - Ditto	Ditto
12	1.56 State that carbon has a valency of four. 1.57 State that carbon can have multiple bonds. 1.58 State what is meant by a monomer. 1.59 State what is meant by a polymer. 1.60 State what is meant by a co-polymer. 1.61 Differentiate between the structure of a thermosetting plastic and a thermoplastic. 1.62 Differentiate between the properties of a thermoplastic plastic and thermosetting. 1.63 Differentiate between the use of thermosetting plastic and thermoplastic. 1.64 State the main defects occurring in plastics. 1.65 State the main limitations in the use of plastics in construction.	• Explain Ditto	Ditto
13	1.66 State the origin of bituminous materials. 1.67 Distinguish between flow bitumen and cut back bitumen. 1.68 Describe the classification of bitumen with respect to viscosity penetration test and softening points and other applicable tests. 1.69 Explain the limitations in use of bituminous materials with respect to their classification. 1.70 Explain the functions of the ingredients of mastic asphalt. 1.71 Explain the reasons for failure of bituminous materials.	• Explain in detail bituminous materials.	• Ditto

Course: Properties of Materials		Course Code: QUS 104	Contact Hours: 1-0-2
Course Specification: Theoretical Content			
General Objective 1.0: Identify the composition and principal properties of Building Materials and Appreciate factors affecting their deterioration in use			
Week	Specific Learning Outcome:	Teachers Activities	Resources
14	1.72 Distinguish between ferrous and non-ferrous metals with respect to tensile strength and modulus of elasticity.	• Explain in detail ferrous and non-ferrous metal.	• Ditto
	1.73 State the approximate percentage of constituents of steel. 1.74 State the difference in properties of steel with different percentages of carbon. 1.75 Interpret the importance of crystalline structure of steel with respect to: a. Corrosion b. Brittleness c. Ductility d. Welding and normalizing 1.76 State the presence of “stranger” atoms in alloys which usually causes stiffening of the structure. 1.77 Interpret the results of tensile, hardness and notch tests on metals.		
15	1.78 State the basic factors causing corrosion. 1.79 Describe the basic electrolytic corrosion process. 1.80 Identify factors which will accelerate/inhibit corrosion process. 1.81 Explain practical methods to control corrosion.	• Explain Ditto	• Ditto
<p>Assessment: Coursework - 10%; Course Test - 10%; Practical - 20%; Examination - 60%</p> <p>Competency: The student should be exposed to the knowledge of properties basic materials used in building works.</p> <p>References: 1. Elliot, J. “Building Science and Materials” 2. Feodesyev, V.T. “Selected Problem and Question in Strength of Materials”</p>			

Building Measurement and Specification

Course: Building Measurement and Specification		Course Code: QUS 201	Contact Hours: 2-0-2
Course Specification: Theoretical Content			
General Objective: 1.0 Know the duties and the relationship between the quantity surveyor and other members of the design and construction team.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1 2	1.1 Summaries the duties which the quantity surveyors are expected to perform. 1.2 Compare and contrast between the work of consulting Quantity Surveyor and the Quantity Surveyor employed by a construction firm. 1.3 Describe the relationship between the quantity surveyor and, <ol style="list-style-type: none"> a. The architect b. Consultant civil/structural engineer c. Other specialist engineer d. The site agent 	<ul style="list-style-type: none"> • Explain using relevant examples. 	<ul style="list-style-type: none"> • Chalkboard • Chalk • Duster
General Objective 2.0: Take off quantities for work involved in traditional domestic building and simple industrial building of not more than two storeys			
Week	Specific Learning Outcome:	Teachers Activities	Resources
3 4 5 6 7	2.1 Take-off quantities for sub-structural work including undulating and sloping sites, stopped foundations and basement. 2.2 Take-off quantities for simple wall and floor construction in super structure. 2.3 Take-off quantities for Doors and windows. 2.4 Take-off quantities for simple roof. construction and coverings. 2.5 Take - off quantities for simple reinforced concrete frames.	<ul style="list-style-type: none"> • Select architectural drawings for a simple domestic building. • Explain taking-off using relevant clauses of SMM. • Measure quantities from drawings. • Give students assignment. • Choose suitable architectural drawing of a framed building and Ditto. 	<ul style="list-style-type: none"> • Architectural drawing • SMM. • Taking-off sheets, calculator, scale rule chalkboard, duster.

Course: Building Measurement and Specification		Course Code: QUS 201	Contact Hours: 2-0-2
Course Specification: Theoretical Content			
General Objective 3.0: Know the purposes of preparing a bill of quantities using various methods of processing dimensions			
Week	Specific Learning Outcome:	Teachers Activities	Resources
8 9 10	<p>3.1 Produce a bill of quantities using the method of abstracting.</p> <p>3.2 Produce a bill of quantities using the method of billing direct.</p> <p>3.3 Describe accurately the method of preparing a bill of quantities using the cut and shuttle method.</p> <p>3.4 Describe the application of computer in producing a bill of quantities.</p> <p>3.5 State what items of work are normally covered by the preliminary section of the bill.</p>	<ul style="list-style-type: none"> • Explain using relevant examples. • Give assignment. • Explain using relevant examples. • Write out a typical preliminary bill for a simple domestic house. 	<ul style="list-style-type: none"> • Chalkboard, Chalk, Duster, Calculator, Abstracting sheets, Billing sheets. • Computer with relevant software. • Chalkboard, Chalk, Duster, SMM, Calculator.
General Objective 4.0: Write simple specification			
Week	Specific Learning Outcome:	Teachers Activities	Resources
11-15	<p>4.1 State purpose and uses of specification.</p> <p>4.2 State sources of information for writing specification.</p> <p>4.3 Write specifications on the following:</p> <ol style="list-style-type: none"> a. Excavation and earthwork b. Blocks c. Cement d. Aggregate e. Concrete f. Timber, etc <p>4.4 Write typical preamble and specification clauses for incorporation into a bill.</p>	<ul style="list-style-type: none"> • Explain using relevant examples. • Write sample specifications for some items. • Allow students to write out the rest in class. • Explain using relevant examples. • Give assignment. 	<ul style="list-style-type: none"> • Chalkboard, Chalk, Duster, SMM, Calculator.
<p>Assessment: Course work - 20%; Course Test - 20%; Practical - 20%; Examination - 40%.</p> <p>Competency: The student should be able to know the duties of Quantity Surveyor in relation to other design/construction team; take-off completely for simple buildings and preparation of bills of quantities for same.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Ivor H. Seeley "Quantity Surveying Practice" Second Edition 2. Ivor H. Seeley "Advanced Building Measurement" Third Edition 			

Tendering and Estimating I

Course: Tendering and Estimating I		Course Code: QUS 209	Contact Hours: 1-1-0
Course Specification: Theoretical Content			
General Objective 1.0: Know Terminologies in Tendering and Estimating			
Week	Specific Learning Outcome	Teacher Activities	Resources
1	1.1 Define the terms: All in labour rate	<ul style="list-style-type: none"> • Use relevant examples to explain. • Give students assignments. 	• Chalkboard, chalk, duster.
General Objective 2.0: Appreciate contractor's activities during the tender process.			
Week	Specific Learning Outcome	Teacher Activities	Resources
2 3-4	2.1 State the information obtained from the following sources. <ol style="list-style-type: none"> a. Technical reports, including site visits. b. Bill of quantities. c. Standard form of building contract conditions. d. Architect's drawings, lists, schedules and specifications. e. Codes of practice relating to estimating. f. Labour and plant performance data. g. Manufacturer's and suppliers' specifications and quotations. h. Subcontractors requirements and quotations. i. Working rule agreement condition. j. Liaison with parties generally. 2.2 Explain the purpose of pre-tender liaison meetings.	<ul style="list-style-type: none"> • Explain using relevant examples. • Use questions and answer techniques to ascertain level of understanding. 	Ditto

Course: Tendering and Estimating I		Course Code: QUS 209	Contact Hours: 1-1-0
Course Specification: Theoretical Content			
General Objective 2.0: Appreciate contractor's activities during the tender process.			
Week	Specific Learning Outcome	Teacher Activities	Resources
	2.3 Use information obtained in 2.1 for preliminary planning, statement of method, plant and equipment schedule, staffing requirements, including subcontractors, material supply, and cash flow.	<ul style="list-style-type: none"> • Use relevant examples to explain. • Carry out preliminary planning, etc with a life project. • Give the students assignments. 	Ditto
General Objective 3.0: Understand the basic principles and scope of estimating			
Week	Specific Learning Outcome	Teacher Activities	Resources
5-6	3.1 Explain techniques of approximate estimating by the use of the following methods. <ul style="list-style-type: none"> a. storey enclosure b. Costing c. Superficial d. Lump or spot prices 	<ul style="list-style-type: none"> • Explain using relevant examples. • Carry out at least one worked example for each method. • Give students assignment. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculator.
General Objective 4.0: Understand the constituent parts of unit-rates.			
Week	Specific Learning Outcome	Teacher Activities	Resources
7 8	4.1 Explain the elements of prime cost under: <ul style="list-style-type: none"> a. Material elements - delivery, unloading, storing, handling and waste. b. plant elements (applied to unit rate): hiring, with associated charges and running costs, builders own plant, including capital cost, depreciation, insurance licenses and running cost. c. labour element - builders own labour, all in labour rate, labour - only subcontractors. 	<ul style="list-style-type: none"> • Use relevant examples to explain. • Give worked examples to illustrate. • Give students assignment. • Explain using relevant examples. • Explain using relevant examples. 	Ditto

Course: Tendering and Estimating I		Course Code: QUS 209	Contact Hours: 1-1-0
Course Specification: Theoretical Content			
General Objective 4.0: Understand the constituent parts of unit-rates.			
Week	Specific Learning Outcome	Teacher Activities	Resources
	4.2 Compare rates based on different analysis e.g: a. Builders own labour V-subcontractors labour. b. Builders own plant V-hired plant. c. Builders own unit rate V-subcontractors or suppliers' all-in quotations e.g. plumbing, finishes.		
General Objective 5.0: Distinguish between prime cost, overhead costs and profits.			
Week	Specific Learning Outcome	Teacher Activities	Resources
9-10	5.1 Define: a. Prime cost. b. Project overheads. c. General overheads. d. Special risks and consideration.	• Explain using relevant examples.	Ditto
11	5.2 Explain the meaning of gross and net profit in a tender. 5.3 Outline the methods by which the various costs and profit may be allowed for a tender.	• Use relevant example to explain.	Ditto
General Objective 6.0: Know types of Contract.			
Week	Specific Learning Outcome	Teacher Activities	Resources
12-15	6.1 Explain cost reimbursable contract: a. Package deal contract. b. Management contract c. Measure and value contract.	a. Explain using relevant examples. b. Give students assignments.	Ditto
<p>Assessment: Course work - 20%; Course Test - 20%; Practical - 0%; Examination - 60%.</p> <p>Competency: The student should be able to know the types of tendering procedures and contractual arrangement, their differences and the basic principles of preparation of all-in rates.</p> <p>References: 1. Smith, R.C. "Estimating and Tendering for Building Work" Longman 2000 Edition 2. Ayeni, J.O. "Principles of Tendering and Estimating"</p>			

Tendering and Estimating II

Course: Tendering and Estimating II		Course Code: QUS 210	Contact Hours: 1-2-0
Course Specification: Theoretical Content			
General Objective 1.0: Appreciate the build up for preliminary items			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1-2 3-4	1.1 Illustrate preliminary items in bills of quantities: prepare lists and schedules of items for pricing including huts, stores, temporary roads, scaffolding, hoisting facilities and transport on site, water electricity and telephone services, site staff etc. 1.2 Outline the means by which items 1.1 may be priced.	<ul style="list-style-type: none"> • Explain using relevant examples. • Price some of the items. • Give students assignments to price other items. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, SMM, calculator.
General Objective 2.0: Know the pricing of attendance on nominated subcontractors.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
5	2.1 Explain the factors involved in pricing general and special attendance on subcontractors.	<ul style="list-style-type: none"> • Explain using relevant examples. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.
General Objective 3.0: Use rate analysis to price items in the bill of quantities.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
6-8 9-10 10-11	3.1 Build up unit rates for: <ul style="list-style-type: none"> a. Surface excavation, trenches and isolated holes, earthwork support to simple excavations, basement excavation, disposal of spoil hardcore. b. Concrete to strip foundations, ground floor slab, including formwork and reinforcement. c. Walls in common and facing bricks and block work. 	<ul style="list-style-type: none"> • Use relevant examples to explain. • Build up unit rates with life data. • Give students assignment to build up for their work section. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster, calculator, dimensions for the separate work section.
General Objective 4.0: Know factors affecting tender prices			
Week	Specific Learning Outcome:	Teachers Activities	Resources
12-15	4.1 Explain the various factors affecting tender price: 4.2 Availability of materials, availability of labour, location of site, height of building etc.	<ul style="list-style-type: none"> • Explain using relevant examples. 	<ul style="list-style-type: none"> • Chalkboard, chalk, duster.

Course: Tendering and Estimating II	Course Code: QUS 210	Contact Hours: 1-2-0
Course Specification: Theoretical Content		
	<p>Assessment: Course work - 20%; Course Test - 20%; Practical - 0%; Examination - 60%.</p> <p>Competency: The student should be able to know preparation of Build-up rates for preliminary items, factors and analysis applied to bills of quantities for low rise building.</p> <p>References:</p> <ol style="list-style-type: none"> 1. W. Howard wainwright and A.A.B. Wood "Practical Builders' Estimating" 4th Edition 2. Peurifoy, R.L. "Estimating Construction Costs" 	

Surveying Courses

Basic Principles in Surveying I

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying I		Course Code: SUG 101	Contact Hours: 1 - 0 - 3
Course Specification: Theoretical Content			
General Objective 1.0: Understanding the Basic Principles and Scope of Surveying and Geo-informatics			
Week	Specific Learning Outcome	Teachers Activities	Resources
1	<p>1.1 Explain the principle of working from 'whole to part' in Survey/Geo-data works.</p> <p>1.2 State the importance of "scientific honesty" made on observations.</p> <p>1.3 Explain with examples the various "checks" made on field observations and during computation.</p> <p>1.4 Define errors or misclosure in surveys and describe methods of "balancing" these.</p> <p>1.5 Explain the need and procedure for "examination" of surveys and Geo-data.</p> <p>1.6 Describe the various classes of survey/Geo-data and their order of accuracy.</p> <p>1.7 Explain the principles of 'economy of accuracy' and its influence on choice of equipment and methods.</p>	<p>• Lecture, give examples of various classes of survey as used in civil engineering.</p>	<p>• Field books</p> <p>• tables</p>
2	<p>1.8 Explain the principles of 'consistency' in surveys/Geo-data.</p> <p>1.9 Distinguish between accuracy and precision.</p> <p>1.10 Describe the procedure of entrusting 'custody' of survey/Geo-data monuments to local officials and the instructions for their 'preservation'.</p> <p>1.11 Name the different branches of surveying and Geo-informatics stating their aims e.g geodetic survey topographic survey, cadastral survey, hydrographic survey, engineering and large scale surveys.</p>	<p>- do -</p>	

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying I		Course Code: SUG 101	Contact Hours: 1 - 0 - 3
General Objective 2.0: Understand the use and methods of using Linen and steel tapes in making linear measurements.			
Week	Specific Learning Outcome	Teachers Activities	Resources
3	2.1 Explain the effect of (a) misalignment (b) slope (c) temperature (d) tension and (e) standardization error on measured distances. 2.2 Apply the corrections listed in 2.1 above. 2.3 Identify chain surveying instruments e.g. Linen tapes, steel tapes, ranging rods. 2.4 State the necessary precautions in the use of the above instruments. 2.5 State the criteria for selection of survey lines and offsets and the limitations on lengths.	<ul style="list-style-type: none"> Lecture, examples of calculation for corrections to be given. 	<ul style="list-style-type: none"> Tapes, chains, and ranging rods.
4	2.6 Describe the methods of making linear measurements in chain surveys - both along the survey line and along offsets. 2.7 State limiting conditions on measurement accuracy on 2.6 above. 2.8 Explain common errors in chain surveying and their sources - e.g. squaring of building corners, wrong booking of values.	- do -	- do -
5	2.9 Explain with sketches the basic methods of check or proof lines, the use of control frame work for position and orientation. 2.10 Describe the general procedure for carrying out a chain survey. 2.11 Illustrate the method of booking field measurements in chain surveys. 2.12 Enumerate field problems and methods of overcoming them. 2.13 Identify errors in simple chain surveys. 2.14 Carry out survey of an area of at least one hectare. 2.15 Book all field measurements. 2.16 Plot survey at a suitable scale. 2.17 Draw to field standards using conventional signs and hand lettering.	- do -	- do -

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying I		Course Code: SUG 101	Contact Hours: 1 - 0 - 3
General Objective 3.0: Understanding the principles of measurement of angles with theodolites and bearings with a magnetic compass and perform such measurement.			
Week	Specific Learning Outcome	Teachers Activities	Resources
6	3.1 Describe the basic principles of ordinary spirit leveling and digital spirit leveling. 3.2 List the specifications of tertiary leveling. 3.3 Explain the (optimum) observing procedure.	• Lecture	• Compass, theodolite, targets.
7	3.4 Describe the use of and criteria for selections of leveling datums. 3.5 Adjust collimation error in level. 3.6 Describe the construction and use of semi-permanent and permanent tertiary bench-marks. 3.7 Book field observations.	Ditto	Ditto
8	3.8 Reduce level. 3.9 Explain arithmetical checks in level reduction. 3.10 Carry out tertiary leveling, reduction and adjustment to produce elevations of all permanent stations along a circuit of about 2km, using ordinary and digital levels. 4.11 Enumerate the uses of tertiary levelling.	Ditto	Ditto
General Objective 4.0: Understand the principles involved in Tertiary Leveling			
Week	Specific Learning Outcome	Teachers Activities	Resources
9	4.1 Describe the various units of angular measure e.g degrees gradients and radian measures, working out their conversion factors. 4.2 Explain the working principles of a surveyors' (Prismatic) compass. 4.3 Describe the procedure of observation with a surveyors' (Prismatic) compass.	• Lecture, give examples of reduction of levels to National datum.	• Levels of various types, staff.
10	4.4 Explain the method of observation with a theodolite. 4.5 Explain the difference in the reading procedure of a theodolites. 4.6 Carry out angular measurements with prismatic compass and theodolites.	Ditto	Ditto

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying I		Course Code: SUG 101	Contact Hours: 1 - 0 - 3
General Objective 5.0: Understand the principles of survey computations and plotting.			
Week	Specific Learning Outcome	Teachers Activities	Resources
11	5.1 Reduce the measured field data with a theodolite to obtain required angles. 5.2 Deduce bearings from the obtained angles. 5.3 Adjust compass bearings of the compass surveyed area. 5.4 Carryout the computation of 5.5 above. 5.5 Retrieve the measured field data of the surveyed area by a total station onto a PC. 5.6 Process the data using the PC. 5.7 Plot the plan of the surveyed area manually at different scales (small, medium and large)	<ul style="list-style-type: none"> Lecture, give examples of computations. 	<ul style="list-style-type: none"> Calculators, computer.
General Objective 6.0: Read, interpret make measurement from maps, layout and engineering plan.			
Week	Specific Learning Outcome	Teachers Activities	Resources
12	6.1 State the uses of different types of map e.g. atlas, geographical, topographical, engineering and guide maps. 6.2 Explain the principles of map scale. 6.3 State the relationships between map scales or representative fractions and the contour interval. 6.4 Identify map symbols and conventional signs. 6.5 Explain their basis and use. 6.6 Identify various Nigerian map series. 6.7 Use map catalogues. 6.8 Describe various methods of showing relief on maps e.g. spot heights, hachures, contours.	<ul style="list-style-type: none"> Lecture, Give students maps and examples to work on. 	<ul style="list-style-type: none"> Examples of various types of maps to students to examine.
13	6.9 Define map grids. 6.10 Use map grids. 6.11 Explain how to establish different reference directions e.g. true north, grid north and magnetic north. 6.12 Define the relationship between the different directions i.e. convergence, declination and compass variation.		<ul style="list-style-type: none"> Set of maps for student exercises. Drawing instruments, protractors dividers, Parallel rule, Scale rules.

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying I		Course Code: SUG 101	Contact Hours: 1 - 0 - 3
13	<p>6.13 Scale off grid coordinates.</p> <p>6.14 Interpret different types of map, layout plans and diagrams/sketches.</p> <p>6.15 Identify simple planimetric details on imageries.</p> <p>6.16 Measure distances from maps and plans.</p> <p>6.17 Determine radius of curves from given diagram.</p> <p>6.18 Read off directions/bearing between given features.</p> <p>6.19 Describe different map reference system.</p>		
	<p>Revision: 2 weeks</p> <p>Assessment: Coursework 20% course tests 20% Practicals 20% Examination 40%.</p> <p>Competency: The student completing this unit should be proficient at measuring distances, and in undertaking a chain survey. The student should also be familiar with leveling techniques be able to reduce the data and plot profiles of levels. The student should be able to use a theodolite for measuring and setting out angles, undertake associated calculations and read maps accurately.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Survey for Engineers (1994) Uran J and Price WF MacMillian 2. Site Surveying (1993) Muskett J., Blackwell.. 		

PROGRAMME: SURVEYING			
Course: Basic Principles of Surveying I		Course Code: SUG 101	Contact Hours: 1-0-2
Course Specification: Practical Content			
General Objective: To Introduce the Students to Basic Principles and Methods in Surveying			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1-2	Range out a straight line (a) between two - intervisible points, (b) between two points that are not intervisible.	• Demonstrate and supervise ranging using ranging poles and total stations.	• Total station, target. • Line, ranging poles, linen tape, chain.
3-4	Carry out linear measurement with tape.	• Supervises the art of measuring using tapes.	Ditto
5-6	Carry out chain surveying exercise of a section of the institution.	• Organises chain surveying procedure.	• Chain, tapes, ranging poles.
9-11	Carry out leveling exercises in the school of Environmental Studies and Engineering.	• Supervise levelling procedure. Directs students to prepare drawing sheets for profiling.	• Engineer level, staff. Computer, target.
12-15	Carry out a profile leveling of all major roads and isles of the institution and plotting the longitudinal sections and cross-sections of the profiles. Measure horizontal angles and vertical angles with a theodolite. Set on 90° and other angles with the theodolite.	• Demonstrates setting up theodolite over a peg and explains the correct procedure to measure angles.	• Digital level, ranging poles, line tapes drawing paper, pencil eraser. • 20" theodolite, tripods targets, ranging rods peg.

Basic Principles in Surveying II

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying II		Course Code: SUG 102	Contact Hours 1-0-2
		Prerequisite SUG 101	
Course Specification: Theoretical Content			
General Objective 1.0: Understanding the basic principles and scope of surveying			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
1	1.1 Observe small vertical angles precisely by repetition. 1.2 Determine horizontal distance using vertical stage and tacheometer.	• Lecture, with examples.	• Engineer's level • Fieldboob
2	1.3 Explain the special characteristics and use of self reducing tacheometers.	Ditto	Ditto
3	1.4 Measure distances using a theodolites as tacheometer. 1.5 Determine spot-heights and survey detail by tacheometry.	Ditto	Ditto
General Objective 2.0: Understand the procedure and methods of third order theodolite and total station traversing.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
4	2.1 Identify the various items of equipment used in theodolite and total station traversing. 2.2 List specifications for measurement of angles and distance. 2.3 Determine bearings and tolerable linear and angular misclosures for secondary and tertiary traverses. 2.4 Explain the need for connection to and procedure for verification of existing controls. 2.5 Describe field method of traversing using surface taping. 2.6 Explain the various precautions in field measurements. 2.7 Describe the field checks applicable.	• Lecture • Worked examples to demonstrate computations.	• Theodolite • Tapes

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying II		Course Code: SUG 102 Prerequisite SUG 101	Contact Hours 1-0-2
General Objective 2.0: Understand the procedure and methods of third order theodolite and total station traversing.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
5	2.8 Use the force centering equipment explaining special advantage thereof. 2.9 Explain the role of theodolite and total station traversing in provision of control for surveys. 2.10 Carry out traverse using surface taping 2.11 Verify the control to which the survey is connected, the surveying of adjacent details (by radiation and intersection), computing the traverse, adjusting distances, bearings and co-ordinates, and producing a plan in ink..	• Lecture • Worked examples to demonstrate computations.	• Theodolite • Tapes
General Objective 3.0: Understand the principles, field methods and calculation procedures for minor triangulation			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
6	3.1 Explain the basic principles of triangulation. 3.2 Enumerates other parameters of triangulation such as selection, beaconing, numbering of triangulation stations, baseline, azimuth determination, extension of connected triangles, angular repetition, reciprocal observations, angular misclosures, field measurement checks etc.	Ditto	Ditto
7	3.3 Explain methods of computing coordinates and heights from field records.	Ditto	Ditto
General Objective 4.0: Understand the basic principles and methods of using total station and GIS Equipment.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
8	4.1 Describe a total station and its accessories. 4.2 Compare total station with a theodolite. 4.3 Explain the working principles of a total station. 4.4 Describe the procedures of observation with a total station. 4.5 Carry out a simple survey using a total station.	• Lecture	• Total station • Targets

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying II		Course Code: SUG 102 Prerequisite SUG 101	Contact Hours 1-0-2
General Objective 4.0: Understand the basic principles and methods of using total station and GIS Equipment.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
9	4.6 Retrieve the measured data from a total station field data on to a PC. 4.7 Process the data from the PC. 4.8 Plot the plan of the surveyed area manually. 4.9 Describe the various types of GPS equipment e.g hand held and tripod types. 4.10 Explain the working principles of GPS. 4.11 Carry out GPS observations on selected points.	Ditto	<ul style="list-style-type: none"> • Total station • Computer • GPS • Software
General Objective 5.0: Understand problems involved in producing contoured plans.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
10	5.1 Name the different reference directions for contoured plan. 5.2 Explain basic need for heights in topographical Engineering and Township Surveys. 5.3 Illustrate optimum distribution of spot heights for contoured plans. 5.4 Describe the use of grids of levels. 5.5 Carry out contouring at 0.5m vertical interval from a mesh of spot heights.	<ul style="list-style-type: none"> • Lecture. 	<ul style="list-style-type: none"> • Levels • Theodolite
General Objective 6.0: Understand setting in out procedure for a medium sized building including.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
11	6.1 Identify the equipment required to set-out a building with accompanying access roads. 6.2 Explain how to set-out a building and the accompanying constraints. 6.3 Construct profiles and datum for a building. 6.4 Explain how profiles are used to control. 6.5 Identify the instruments used for taking internal and external dimensions.	<ul style="list-style-type: none"> • Lecture, • Illustrate site practice with slides or photographs. 	<ul style="list-style-type: none"> • Theodolite/Total • Station

PROGRAMME: SURVEYING			
Course: Basic Principles in Surveying II		Course Code: SUG 102 Prerequisite SUG 101	Contact Hours 1-0-2
General Objective 6.0: Understand setting in out procedure for a medium sized building including.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
12	6.6 Determine the areas of a building and its site. 6.7 Explain how running internal and external measurements are taken horizontally and vertically. 6.8 State the procedure for checking vertically a building using Theodolite, Optical Plumb, and Plumb-bob. 6.9 Describe the invert of a drain, a sight rail and a traveller. 6.10 Calculate suitable length of a traveller and reduced levels of sight rails from given drawings. 6.11 Establish sight rails for horizontal and depth control of a straight drain between manholes.	Ditto	<ul style="list-style-type: none"> • Theodolite • Optical Plumb • Plumb-bob
13	6.12 Explain the survey terms use in road construction. 6.13 Describe methods of route surveying. 6.14 Describe the types of control used for embankments, cuttings and levels. 6.15 Calculate volumes of cut and fill on a given straight road with transverse sloping ground.	Ditto	<ul style="list-style-type: none"> • Theodolite/total station levels
<p>Revision 2 weeks. Revise main topics, gives worked examples etc.</p> <p>References Surveying for Engineers (1994) Uren J Macmillan and Price WF, Setting Out Procedures (1998) Sonlorove BM Butherworth Heineman.</p> <p>Assessment: Coursework 20% Course tests 20% Practical 20% Examination 40%.</p> <p>Competency: The student who competes this unit should be proficient in using levels and theodolites, capable of undertaking simple surveys and be able to set out buildings with confidence.</p>			

PROGRAMME: SURVEYING II			
Course: Basic Principles of Surveying II		Course Code: SUG 102	Contact Hours: 1-0-2
Course Specification: Practical Content			
General Objective 1.0: The use of levels, theodolites and total station in measurement of, bearings, heighting, and triangulation and plan production.			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1-4	Carry out compass traversing of a closed figure, produce the plan and make graphical adjustment.	<ul style="list-style-type: none"> • Demonstrate compass traversing and direct the student to produce plan. 	<ul style="list-style-type: none"> • Compass, drawing paper, scales, pencil, rules, eraser.
5-7	Carry out theodolite traversing of the roads surrounding the school of engineering. Compute and plot the traverse.	<ul style="list-style-type: none"> • Supervise the use of traversing. • Direct the students to use reduced bearing and distances to plot a traverse. 	<ul style="list-style-type: none"> • Theodolite, total station, targets, poles, drawing
8-12	Use theodolite along with staff to obtain distances and heights.	<ul style="list-style-type: none"> • Supervise the use of theodolites as in tacheometric surveys. 	<ul style="list-style-type: none"> • paper, pencil, eraser. • Theodolite, staff.
12-14	Determine spot levels and survey detail by tacheometer working at accuracies attainable in various methods of optical distance measurements. Plots datum to scale and prepares a contour drawing. Carry out tertiary leveling, reduction and adjustment to produce elevations of all permanent stations along a circuit of about 5kms. Undertake a service of setting out exercises, e.g. for a small building.	<ul style="list-style-type: none"> • Demonstrate the procedure for tertiary leveling along a circuit. 	<ul style="list-style-type: none"> • Levels, pegs, tape. • Theodolite staff.
<p>Assessment: Coursework - 10%; Course Test - 10%; Practical - 40%; Examination - 40%.</p> <p>Competency: The student should be familiar with the uses of theodolites and leveling instrument in Civil and Building works.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Benfester Raymond "Surveying" 2. N.N. Basak "Surveying and Leveling" 			

SIWES and Project

Supervised Industrial Work Experience Scheme

Course: Supervised Industrial Work Experience Scheme		Course Code: QUS 216	Contact Hours: 4 - Months
Course Specification: Theoretical Content			
General Objective 1.0: Inculcate into the students the work attitude require of them in the industrial setting.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	1.0 Understand the organizational structure in his/her place of attachment. 1.1 Identify the various departments/units of the organization. 1.2 Identify the functions of the various units or department in the organization. 1.3 Identify the relationships between the different units within the organization.		
General Objective 2.0 Know the general safety precautions in the construction industry.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	2.1 State the safety precautions required on a construction site. 2.2 Apply General safety regulations to work situation such as:- a. Personnel safety. b. Safety of other workers. c. Clothing. d. Cleanliness of work environment. e. Equipment/tools on the construction site.		
General Objective 3.0: Understand the various processes of site preparation.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	3.1 Interpret the working drawings either by sketching, demonstration or any other method as the case may be.		
	3.2 Conduct the Soil investigation by approved method such as trial holes, boreholes. 3.3 Perform on site and laboratory tests. 3.4 Carry out site clearing and leveling using appropriate equipment. 3.5 Set out building using builders or the theodolite methods..		

Course: Supervised Industrial Work Experience Scheme		Course Code: QUS 216	Contact Hours: 4 - Months
Course Specification: Theoretical Content			
General Objective 4.0: Understand the methods of setting out of building.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	4.1 Interpret building drawings. 4.2 Make working drawings from building design. 4.3 Dig trenches in accordance with the set out lines for even and uneven grounds. 4.4 Establish the final level of the concrete footing using leveling pegs and spirit level.		
General Objective 5.0: Understand the various construction processes.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	5.1 Evaluate the various operations and how they are being sequenced. 5.2 Identify the various operatives involved in the construction processes, participating where feasible. 5.3 Evaluate the economy in the use of labour, material and equipment with high initial costs especially for repetitive works such as scaffolding in metal forms as opposed to timber forms.		
General Objective 6.0: Understand the post contract relationship among the various professionals, contractors and the client with regard to site meetings and valuations.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	6.1 Distinguish the parties to the contract 6.2 Explain the relationship between the professional Quantity Surveyor and other professionals like Architects, Engineer, Clerk works, etc and state their responsibilities on the site. 6.3 Write a valuation report and valuation certificate for a given project stating which professionals are responsible for other certificates. 6.4 State the strength of a payment certificate with regards to the contractor's capability in collecting payment from the client		

Course: Supervised Industrial Work Experience Scheme		Course Code: QUS 216	Contact Hours: 4 - Months
Course Specification: Theoretical Content			
General Objective 7.0: Know how to read and interpret drawings for residential and office building			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	<p>7.1 Evaluate the convention being adopted in folding, storing and retrieval of drawings.</p> <p>7.2 Interpret production drawings i.e plans, elevations, sections, and details drawings</p> <p>7.3 Interpret simple Engineering drawings, e.g plans, sections, and details drawing</p> <p>7.4 Make the drawings of an architect project from designs produced by an architect</p>		
General Objective 8.0: Undertake the working-up of simple buildings.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	<p>8.1 Carry out squaring operations.</p> <p>8.2 Check measured quantities from traditional and “cut and shuffle” sheets.</p> <p>8.3 Describe basic abstracting operations.</p> <p>8.4 State the arrangement of trade sections in the previous bill</p>		
General Objective 9.0: Understand the Taking-off of quantities, for simple buildings of not more than three bedroom bungalow under the following sections: substructure, concrete work, block and brick work, roofing work, wood work, metal work, finishing and painting and decorating.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	<p>9.1 Check the production drawings for discrepancies and report any incorrectness on the drawings.</p> <p>9.2 Apply standard methods of measurement (SMM) to various work sections.</p> <p>9.3 Prepare a sequence of measurement for the various work sections.</p> <p>9.4 Take-off quantities applying the SMM to the various sections.</p> <p>9.5 Title, page and sign, dimension sheets.</p>		

Course: Supervised Industrial Work Experience Scheme		Course Code: QUS 216	Contact Hours: 4 - Months
Course Specification: Theoretical Content			
General Objective 10.0: Know the mechanisms of site administration and the safety health and welfare regulations operative at the site.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	<p>10.1 Illustrate the organizational chart of the site.</p> <p>10.2 Describe the relationship between the various construction team of the company.</p> <p>10.3 Identify the placement of accident prevention signs including provisions of lighting, telephone etc on site.</p> <p>10.4 Identify the establishment of first aid boxes and their locations on site.</p> <p>10.5 Identify the type of unions that exist on the site.</p> <p>10.6 Evaluate the social services provided by the contractor to his staff.</p> <p>10.7 State the grievances procedure in the construction firm.</p>		
General Objective 11.0: Know the methods of ordering, receiving requisitioning and checking of materials on site.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	<p>11.1 Evaluate the procedure in ordering materials for construction works.</p> <p>11.2 Check material invoices on delivery.</p> <p>11.3 Issue out materials from site store following appropriate procedures.</p>		
General Objective 12.0: Know how to produce technical reports with bar charts of all activities undertaken during the Supervised Industrial Work Experience Scheme programme.			
Week	Specific Learning Outcomes:	Teachers Activities	Resources
	<p>12.1 Record all the activities that are carried out each day (each student should possess "an industrial attachment log book" to do this).</p> <p>12.2 Record the weekly summary of his/her activities in his/her log book and have it certified by his industry based supervisor.</p> <p>12.3 Record graphically his/her weekly activities using bar charts.</p>		

Course: Supervised Industrial Work Experience Scheme				Course Code: QUS 216	Contact Hours: 4 - Months	
Course Specification: Theoretical Content						
General Objective 12.0: Know how to produce technical reports with bar charts of all activities undertaken during the Supervised Industrial Work Experience Scheme programme.						
Week	Specific Learning Outcomes:				Teachers Activities	Resources
	12.4 Write a monthly summary of his/her activities for his/her supervising lecturers comments in his/her log book 12.5 Write a comprehensive technical end-off industrial attachment report					
	Activities 1. Understanding 2 Read and interpret					
	Week One	Week Two	Week Three	Week four		
	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
	Assessment: Practical - 50%; Report - 50%					
	Competency: The student should be able to know the basic principles of quantity surveying work and attitude required within the Construction Industry.					

Project

Course: PROJECT		Course Code: QUS 214	Contact Hours: 60
Course Specification: Theoretical Content			
General Objective 1.0: Take-off the quantities from simple drawing			
Week	Specific Learning Outcome:	Teachers Activities	Resources
1-5	1.1 Square-up the dimensions. 1.2 Work-up the quantities in 1.1 above.	<ul style="list-style-type: none"> • Inspect the various drawing submitted and give approval. • Mark taking-off process and give approval to proceed. • Mark working up process and give approval to proceed. 	<ul style="list-style-type: none"> • Architectural drawings • Taking-off sheet • Abstracting sheets • Calculators
General Objective 2.0: Prepare a draft bill of quantities			
6-12	2.1 Prepare a draft bill of quantities excluding the conditions of contract, preliminaries and Trade preambles. 2.2 Conduct market survey to obtain prices of various building materials. 2.3 Build-up the rates using information obtained from 2.2 above. 2.4 Price-up the draft bill of quantities.	<ul style="list-style-type: none"> • Inspect draft bill for conformity to existing practice and give approval to proceed. • Make comparison of prices obtained at market survey. • Inspect rate analysis for uniformity to existing practice. • Inspect priced draft bill for errors in extension and total. 	<ul style="list-style-type: none"> • Billing sheets • A-4 size sheets • Calculators

Guidelines for text book writers

NATIONAL DIPLOMA AND HIGHER NATIONAL DIPLOMA

The following guidelines are suggestions from the Engineering Committees to the writers of the textbooks for the new curricula. They are intended to supplement the detailed syllabuses which have been produced, and which define the content and level of the courses.

Authors should bear in minds that the curriculum has been designed to give the students a broad understanding of applications in industry and commerce, and this is reflected in the curriculum objectives.

- One book should be produced for each syllabus
- Page size should be A4
- The front size should be 12 point for normal text and 14 point where emphasis is need
- Line spacing should be set to 1.5 lines
- Headings and subheadings should be emboldened
- Photographs, diagrams and charts should used extensively thought the book, and these items must be up-to-date
- In all cases the material must be related to industry and commerce, using real life examples wherever possible so that the book is just a theory book. It must help the students to see the subject in the content of the “real word”
- The philosophy of the courses is one of an integrated approach to theory and practice, and as such the books should reflect this by not making and artificial divided between theory and practice.
- Illustrations should labeled and numbered.
- Examples should drawn from Nigeria wherever possible, so that the information is set in a country context.
- Each chapter should end with student self-assessment quotations (SAG) so that student can check their own master of the subject.
- Accurate instructions should be given for any practical work having first conducted the practical to check that the instructions do indeed work
- The books must have a proper index or table of contents, a list of references and an introduction based on the overall course philosophy and aims of the syllabus.
- Symbols and units must be listed and a unified approach used throughout the book
- In case of queries regarding the contents of the books and the depth of information, the author must contact the relevant curriculum committee via the National Board for technical Education.

- The final draft version of the books should be submitted to Nigerian members of the curriculum working groups for their comments regarding the content in relation to the desired syllabus.

List of Minimum Resources

LIST OF EQUIPMENT FOR THE NATIONAL DIPLOMA IN BUILDING AND QUANTITY SURVEYING PROGRAMME

LABORATORIES		
1.	Structures/Strength of Materials	
2.	Material Science Laboratory	
1.	B & K sound level units octave filter	3
2.	Micro-computer	1
3.	Planimeter stop	3 sets
4.	Stop watches	10
5.	Daylight factor units	3 sets
6.	Sound pressure meter	3
7.	Accelerometer for vibration analysis	2
Soil Mechanics		
1.	Consistency limits test apparatus	10
2.	Compacting core machine	1
3.	Compacting factor testing machine	1
4.	Particles size distribution test apparatus	5
5.	Compaction test apparatus	1
6.	Core penetrometer	1
7.	Moisture content test apparatus	6
8.	Specific gravity test apparatus	10
9.	Density test apparatus	10
10.	Le Chatelier test apparatus	5
11.	Augers and rigs	6
12.	V-B Consistometer test apparatus	1
13.	Drying Ovens	3
14.	Sample collecting trays and sample containers	10
15.	150mm cube moulds	30
16.	15mm cylindrical moulds	30
17.	Balanced	2 of each
18.	Vicat apparatus	2
19.	Thermometers	5 of each

20.	Cement fineness test apparatus	2
21.	Measuring cylinders	5
22.	Soil hydrometers	5
23.	Crucibles, spatulas, filter papers funnel and verniercalipers	Assorted
24.	Desiccators	6
25.	Curing tank	
26.	Stop watches	10
27.	Beam moulds	4
28.	Crushing machine	1
WORKSHOPS		
Carpentry (Planes and Saws)		
1.	Jack planes	15
2.	Smoothing planes	15
3.	Block planes	6
4.	Shoulder planes	6
5.	Rebate plane	6
6.	Multi-plough plane	2
7.	Grooving/plough plane	6
8.	Bull nose plane	2
9.	Compass plane	2
10.	Jointing plane	6
11.	Side rabbet plant	6
12.	Rip saw	6
13.	Cross cut/band saw	6
14.	Tenon saw	12
15.	Panel saw	6
16.	Coping saw	6
17.	Nest of saws compass saw	6
18.	Key hole saw	6
19.	Bracket or Fret Saw	6
Chisels		
20.	Ordinary firmer (set) 3mm, 6mm, 12mm, 18mm and 25 mm.	6
21.	Bevel-edge firmer (set) 3mm, 6mm, 12mm, 18mm and 25mm	6
22.	Mortice (set) 6 each of 6mm, 9mm, and 12mm pairing bevel-edge (set)	6
23.	Firmer gauge (Set)	6

24.	Paring firmer (set)	6
25.	Turning chisels (set)	6
Bits		
27.	Centre (Set)	6
28.	Auger (set)	6
29.	Twist (set)	6
30.	Counter sink (set)	6
31.	Rose (set)	6
32.	Gimlet	6
Driving/Striking Tools		
33.	Screw driver (set of six)	6
34.	Mallet	6
35.	Claw hammer	6
36.	Pane hammer	6
37.	Warrington hammer	6
38.	Bradawl	6
Cramps		
39.	Sash (set)	6
40.	'G' cramp	6
41.	Corner	6
42.	Bench hold fast	6
Miscellaneous		
43.	Cork rubber	6
44.	Triangular files (set)	6
45.	Flat files	6
46.	Scraper (flat)	6
47.	Dividers	6
48.	Round files (set)	6
49.	Scraper (cabinet)	6
50.	Calipers set (inside and outside)	6
51.	Spoke shaves (Set)	6
52.	Wood-workers pencils	6
Machines		
53.	Circular saw bench	1
54.	Surfacer	1

55.	Wood lathe with accessories	1
56.	Band saw	1
57.	Spindle moulder	1
58.	Radial circular saw	1
59.	Compression and spraying	1
60.	Universal wood-worker	1
61.	Tenon saw	1
62.	Mortiser (chisel and chain)	1
63.	Sander (drum, disc and belt)	1
64.	Cross cut sawing machine	1
65.	Drilling machine	1
66.	Jig saw	1
67.	Presser (School size)	1
Utilities		
68.	Work benches	16
69.	Tool trolleys	4
70.	Hangers for dresses	
AV		
71.	Magnetic board	2
72.	Display board	2
73.	Overhead projector and transparencies	1
74.	Slide projector	1
75.	Film strips projector	1
76.	Opaque projector	1
77.	Projector screen	1
Dressing		
78.	Overalls (aprons-brown)	55
79.	Goggles	40
Chalk Board		
80.	T. Square	2
81.	Set square 60/45	2
82.	Compasses	2
83.	Protractor	2
84.	Duster	2
85.	Ruler (metre rule)	2

Powered Hand Tools		
86.	Circular saw	4
87.	Drills	4
88.	Orbital sander	4
90.	Jig saw	4
91.	Blower	4
92.	Sprayer	4
93.	Grinding machines	2
94.	Sharpening machines	2
95.	Grinding stone	5
96.	Oil cans	5
97.	Saw vices	5
98.	Bench stop (metal type)	5
99.	Band saw setter/sharpener	1
100.	Grinding for long blades e.g surface plane	1
101.	Paint brushes (sets)	10
102.	Paint containers	10
103.	Putty knives	10
104.	Glue pot 2 jacket (for animal glue)	4
105.	Glue spreader	30
106.	Glue brushes (various sizes)	5 each
Gauges, Knives, etc		
107.	Marking gauge	5
108.	Mortice gauge	5
109.	Combination gauge	2
110.	Cutting gauge	5
111.	Marking knives	5
112.	Vernier knives	5
113.	Try square	10
114.	Metre square	5
115.	Four fold wooden ruler metric	5
116.	Measuring tapes metric (6m)	5
Concrete/Blocklaying		
1.	Portable compressor and accessories	1
2.	Bar bending machine	1

3.	Steel cutter	1
4.	Mash/BRC cutter	1
5.	Tyrolean machine	1
6.	Concrete vibrators: poker and table vibrators	1 each
7.	Hand rammers	4 each
8.	Concrete portable mixer (At least 2cu. ft capacity)	1
9.	Crick/block making machine	1
10.	Wheel barrow	5
11.	Watering can	5
12.	Shovels	20
13.	Head pan	10
14.	Terrazzoe polishing machine	1
15.	Brick saw	1
16.	Concrete nail gun	1
17.	Hand toolse.g spirit level, hammers, rulers., squares, mallet, rapes, floats, etc.	Assorted
18.	Tilting mixer	1
19.	Multiflow mixer	1
20.	Cement box	5
21.	Aggregates and sand box	5
22.	Slump cone	2
23.	Curing Tanks	2
Plumbing		
1.	Guillotine (three feet)	1
2.	Fittings	Assorted
3.	Pumps various types e.g. centrifugal, submissive etc	1 each
4.	Valves, surge tanks, water base	Assorted
5.	Pipe bending machine	1
6.	Light duty drilling machine	1
7.	Heavy duty drilling machine	1
8.	Table drilling machine	1
9.	Sheet metal folding machine	1
10.	Tapping machine	1
11.	Forge	1
12.	Arc-welding machine	1
13.	Oxy-acetylene generator	1

14.	Acetylene generator	1
15.	Electric soldering tool	2
16.	Refix hydraulic pipe bender	1
17.	Grinding machine	1
18.	Jack pump	1
19.	Pipe standing vices	6
20.	Table vices	6
21.	Cooper tube bender	1
22.	Cooper bit	1
23.	Hacksaw	
24.	Boxwood being dresser	20
25.	Shave hooks	6
26.	Tin snips	6
27.	Hacking knife	6
28.	Gimlet for lead pipe and wood screws	6
29.	Wrenches	Assorted
30.	Dies	Assorted
Painting, Decorating and Glazing		
1.	Spraying machine	2
2.	Paint rollers	6
3.	Diamond/glass cutter	2
4.	Assorted Hand tools, e.g knives., hooks stirrer, hammers, pincers, punch straight edge, screw-drivers, wire brushes, trowels, chisel, strainers, filling board and hawk, rubbing block etc.	2
5.	Paint kettle and hook	2
6.	Bucker	10
7.	Tray	10
8.	Sanders	6
9.	Wire brush	5
10.	Descaling chisels	2
11.	Needles gum	1
12.	Gas torch	10
13.	Brushes	2
14.	Paint pad	
15.	Pain mitten	1

Electrical Workshop		
1.	Bending vices/machine	10
2.	Electrician tool kits	4
3.	Soldering Iron	10
4.	Avo meters	2
6.	Voltmeters	2
7.	Wiring boards	2
8.	Consumer units	
	(i) circuit breakers	6
	(ii) distribution box	Assorted
	(iii) switches	5
	(iv) meters	Assorted
	(v) mains switch	5
		Assorted
Studio/Drawing Room		
1.	Drawing table (A1 size)	31
2.	T.square (A1 size)	31
3.	Set square	3
4.	Drawing pen	3
5.	Chalkboard set square	2 set
6.	Chalkboard protectors	2
7.	Chalkboard divider	2
8.	Chalkboard pair of compasses	2
9.	Chalkboard Wooden straight edges	2
10.	Chalkboard lettering set	2 sets
11.	Drafting machine for standard drawing table	4
12.	Templates	2 sets
13.	Plastic curves	2 sets
14.	Projector	2 sets
15.	Electronic calculators for the use in Quantity-Surveying Department	20
16.	Drawing Instruments	3
17.	Scale Rules	Assorted
18.	One light table (AO size)	of each
Other Facilities		
1.	Land Surveying Equipment Store	

1.	Leveling instruments	6
2.	Theodolites	6
3.	Compasses with tripods	6
4.	Plane table	5
5.	Tripods (level and theodolite)	12
6.	Staves	10
7.	Ranging poles	20
8.	Surveying umbrella	2
9.	Chains	7
10.	Steel arrows	30
11.	Planimeter	6
12.	Tapes (30m, 50m and 100m)	6 each
13.	Optical square	6
14.	Pocket altimeter	7
15.	Set of targets	3
16.	Steel band	5
Computer Room		
1.	Minicomputer with associated printers and terminals and preferably a UPSS (Uninterrupted Power Supply System)	2
2.	Softwares of various Engineering and Environmental Packages	Assorted
3.	Duplicating and Printing Room	
1.	Photostating machine	1
2.	Plan Printing machine	1
3.	Duplicating machine	1
4.	Trimming machine	1
5.	Scanning machine	1
Safety Equipment for Each Workshop		
1.	First aid box	1
2.	Safety goggles	32
3.	Safety caps	32
4.	Rubber boots	32 pairs
5.	Leather apron	32
6.	Leather palm gloves	32 pairs
7.	Fire extinguisher	2
8.	Fire buckets	2

9.	Safety charts and drawings	Assorted
10.	Shower	1
Safety Equipment for each Laboratory		
1.	First Aid Box	1
2.	Shower	1
3.	Fire Extinguisher	2
4.	Fire buckets	2
5.	Safety Charts and Drawings	Assorted

List of Participants

UNESCO-NIGERIA PROJECT IN SUPPORT OF REVITALISATION OF TECHNICAL AND VOCATIONAL EDUCATION IN NIGERIA

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