



THE NIGERIAN INSTITUTE OF BUILDING EXAMINATION SYLLABUS

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PROGRAMME: MATURED
COURSE CODE: MCE 601
COURSE TITLE: BUILDERS IN SOCIETY

PROGRAMME: MATURED CANDIDATES SCHEME				
COURSE TITLE: BUILDERS IN SOCIETY		COURSE CODE:MCE 601		CONTACT HOURS:
GOAL: TO EQUIP CANDIDATES WITH COMPETENCIES IN BECOMING A PROFESSIONAL BUILDER IN THE SOCIETY			GOAL: TO EQUIP CANDIDATES WITH COMPETENCIES IN BECOMING A PROFESSIONAL BUILDER IN THE SOCIETY	
COURSE SPECIFICATION: THEORETICAL CONTENT			PRACTICAL CONTENT:	
Modules	Topics	Mentor’s Activities	Specific learning Outcomes	Learning Resources
1	Know about different professional associations and bodies backed by law to practice in Nigeria with their enabling acts. e.g NIOB-CORBON NSE-COREN NITP-TOPREC NIA-ARCON NIS-SURCON NIQS-QSVRABON NIESV- Knowledge about APBN.	Candidates will be guided through various stages of professional development such as evolution of NIOB from 1967,the approved structures, changes effected over the years and the current status quo.	Candidate will be able to understand the legal frameworks and responsibilities of the professional associations and bodies in Nigeria. Identify the difference between professional associations and professional bodies. Candidates will be familiar with laws setting up the bodies	Various Acts establishing the professional bodies and their history as published by the associations and bodies. Published text books on the subjects. NIOB compendium and history of NIOB/CORBON Act cap 40 LFN 2004
General Objective 2: PROFESSIONAL PRACTICE AND ETHICS				
2	Discuss in details professional practice with respect to: 2.1 History of NIOB 1837 to date. 2.2 Aims and objectives of NIOB and formation dates 2.3 admission procedures and categories of membership. 2.4 knowledge about past and current elected officers of NIOB 2.5 Ethics 2.6 .Ethical standards 2.7 Canons 2.8 Fundamental canon and principles for builders. 2.9 world federation of engineering model codes of ethics.	Candidates mentored through professional practice and application of codes of ethics	Candidates will be able to guide their practice with codes, ethics, canon and standards with knowledge of NIOB history.	Text book on PPP. CORBON book on canon and ethics for builders, NIOB Journals and compendium, with History of NIOB.

General Objectives 3: BUILDING PROCUREMENT LAW, ADR and EXECUTIVE ORDER 3 & 5				
3	<p>3.1 Discuss Procurement in relation to procurement act 2007 as amended.</p> <p>3.2 Discuss the findings of committee set up by the FG on abandoned projects in Nigeria and the reasons for recommending new procurement Process.</p> <p>3.3 Discuss the role of expression of interest in procurement and provisions of the act associated with its adverts.</p> <p>3.4 Discuss Technical Bids in Procurement.</p> <p>3.5 Discuss Financial Bids in Procurement.</p> <p>3.6 Discuss opening of bids and the role of whistle blowers as outlined in the act.</p> <p>3.7 Discuss the clause that the lowest bids necessarily wins the contract..</p> <p>3.8 Discuss the provision of the executive order 5 in contract execution.</p>	Candidates to be mentored on builders roles in procurement process.	Candidates to have comprehensive knowledge of the new procurement process and executive order 5 provision for exclusivity for involvement of professionals in contract execution in Nigeria.	<p>Procurement Act 2007</p> <p>Text book on PPP</p> <p>Rivers State 2019 workshop proceedings</p> <p>Lagos State 2019 AGM Proceedings.</p> <p>NIOB Journals/Compendium 1996-2019.</p> <p>2018 Builders congress proceedings.</p>
General Objective 4: CONTRACT LAW AND ARBITRATIONS.				
4	<p>4.1 Define contract law</p> <p>4.2 Identify offers from acceptance</p> <p>4.3 Differentiates between invitation to treat and offer and its applicability to the building industry.</p> <p>4.4 Discuss 5 essentialities of a valid contract.</p> <p>4.5 Treat case studies with the 5 essentialities of a valid contract.</p> <p>4.6 Discuss JCT contract provisions.</p>	Candidates will be guided through applications of the 5 essentialities of a valid contract to different contracts scenarios.	<p>Candidates should Know the difference between formal and informal contract.</p> <p>Candidates to apply the 5 essentialities of valid (contract- to-contract) scenarios to determine contract validity.</p> <p>Jct provisions with respect to</p> <ul style="list-style-type: none"> -contract formation - determination -stop work order - variations etc. 	<p>Text books on principles of contract law.</p> <p>Text books on PPP</p> <p>NIOB Journals.</p> <p>Various NIOB AGM reports.</p> <p>Bulletins and NIOB publications</p>
General Objective 5: Development of Building Regulations and Bye laws. Codes and Standards.				
5	<p>5.1 Discuss the developments of building regulations and bye laws from pre-colonial day to date.</p> <p>5.2 Define bye laws</p> <p>5.3 Define building regulations</p> <p>5.3 Evolution of Urban and Physical Planning Law.</p>	Students will be guided on the use of Builders documents as instruments of enforcements of urban and physical planning laws.	<p>Candidates will know the history of building regulation and bye laws from Lagos City -Building Bye laws and regulations and other associated laws in the colonial period.</p> <p>-Candidates will know about the federal Urban planning law of 1974.</p>	<p>NIOB JOURNALS</p> <p>TEXT BOOKS on professional practice and procedures</p>

	<p>5.4 The roles of professional builders in the implementation of Urban and Physical planning law at:</p> <ul style="list-style-type: none"> - Federal level - State level <p>Builders Instruments of enforcements of urban and physical planning law</p> <p>5.5 Discuss evolution of National building Codes from 1986 to 2006 when the first edition was released and subsequent revisions.</p> <p>5.6 Different code specifications for building components, operations and materials.</p> <p>5.7 Code requirements for builders' documents.</p> <p>5.8 Building Codes Enforcement Agency</p> <p>5.9 Compliance form and Builders responsibilities.</p>		<p>- Candidates will know about various states physical planning laws.</p> <p>-Builders documents as instruments of enforcements.</p> <p>Compliant.</p> <p>-National building codes evolution</p> <p>-Codes requirements for building production managements.</p> <p>-Materials components</p>	
General Objective 6: ENTERPRENUESHIP DEVELOPMENTS.				
6	<p>6.1 Define entrepreneurship developments.</p> <p>6.2 Discuss process of entrepreneurship developments</p> <p>6.3 Stages of entrepreneurship process</p> <p>6.4 Characteristics of entrepreneurship developments.</p>	<p>Candidates to be mentored of practical ways to distinguish their entrepreneurship ventures from general ones in the market.</p>	<p>Candidates should be able to identify entrepreneurship opportunities available in the building industry. e.g. Material Merchants Equipment Lessor Consultancy etc.</p>	<p>NIOB JOURNALS</p> <p>TEXT BOOKS on professional practice and procedures</p>
General Objective 7: Construction Programming and Scheduling - A significant part of Building Production Management.				
7	<p>7.1 Define building production management,</p> <p>7.2 Discuss project planning and its difference from scheduling.</p> <p>7.3 Relate Schedules to Work breakdown Structures (WBS).</p> <p>7.4 Discuss importance of construction scheduling.</p> <p>7.5 Discuss tasks achievable with construction schedule.</p> <p>7.6 Introduce relevant software for construction planning.</p> <p>7.7 Initiating a construction project, Planning, execution, monitoring and closure.</p> <p>7.8 Understanding breakdown structure</p>	<p>Candidates to be guided on the practical use of a suitable planning software.</p>	<p>Candidates should be able to prepare a PQMP</p>	<p>NIOB JOURNALS</p> <p>TEXT BOOKS on professional practice and procedures</p>

	7.9 steps for creating a construction programme.			
General Objective 8: Project Quality Management Plan				
8	<p>8.1 Problems of quality projects in Nigeria resulting to:</p> <ul style="list-style-type: none"> - poor finishes - collapsed building - time and cost over run - poor standardization of materials - poor record keeping of activities on site. <p>8.2 provision of NBC section 2.32 for quality management plan.</p> <p>8.3 Reasons for quality management plan.</p> <p>8.4 The role of compliance enforcement form on PQMP.</p> <p>8.5 Barriers to Quality Management Plan.</p> <p>8.6 How to overcome these barriers.</p> <p>8.7 benefits of improved quality project.</p> <p>8.8 Guidelines for preparation of PQMP.</p>	Candidates guided on live project preparation of PQMP. Other relevant software can be used.	Candidates should be able to prepare a PQMP.	<p>Text Book on PQMP.</p> <p>CORBON text book on PQMP</p> <p>Other relevant software</p>
General Objective 9 : Project Health and Safety Plan				
9	<p>9.1 Define Site Organization</p> <p>9.2 Discussion on Work at Height</p> <p>9.3 Discuss First Aid Training for Work</p> <p>9.4 Discuss the content of First Aid Kit</p> <p>9.5 Discussion on How Good House Keeping Can be Life Saving in Construction</p> <p>9.6 Discuss on Safe and Unsafe Acts</p> <p>9.7 Discuss on potential Risk and Hazard on Construction Sites</p> <p>9.8 Discuss emergency response plan, Health and Safety Policy</p> <p>9.9 Discuss Health and Safety Meetings and Pep-talks on sites</p> <p>9.10 Accident investigation procedures</p> <p>9.11 Root cause analysis of incidents</p> <p>9.12 Provision of Insurance policy of Health and Safety issues on Sites.</p> <p>9.13 Use of relevant software for health and safety plan.</p>	Candidate to be mentored on the use of Fire Extinguisher, Safe Keeping Acts	<p>Candidate would understand Health and Safety application to Building Construction</p> <p>Candidate would understand how to prevent potential Risks & Hazard on site</p> <p>Candidate would understand the accident investigative procedures on site</p> <p>Candidate would understand how to make provision of Insurance Police on Construction Site</p>	Text Books on Health and Safety, Professional Practice and Procedure Compendium

General Objective 10: APPLICATION OF ICT IN CONSTRUCTION				
10	<p>10.1 Define ICT in relation to building profession and discuss its application to building industry.</p> <p>10.2. Discuss benefits of ICT to Building Industry.</p> <p>10.3 Discuss relevant softwares and applications useful to building industry.</p> <p>10.4 Evolving trends in ICT applications to building Industry.</p> <ul style="list-style-type: none"> - integrated projected delivery - BIM -BMS-Building Management System -Building Energy Management System-BEMS -Use of Drones in Construction -Use of CCTV in constructions. <p>11.5 ICT applications in preparations of Builders documents.</p> <p>11.6 Introduction to digital construction, artificial intelligence and robotics in construction.</p>	<p>Candidates to be mentored on the use of BIM compliant software, project planning software and other relevant software.</p>	<p>Candidates should understand ICT applications to buildings, relevant software to the building industry and their applications.</p>	<p>NIOB JOURNALS</p> <p>Text Books on professional practice and procedures and all relevant software especially those recommended by the Institute.</p>
General Objective 11: Construction Methodology: Candidates to be taught how to prepare construction methodology for different types of buildings.				
11	<p>11.1. Discuss the constituents of Project details</p> <p>11.2 Brief description of the project</p> <p>11.3 Basis of Construction Programme</p> <p>11.4 Analysis of construction Limitations</p> <p>11.5 Details of personnel involved in the project.</p> <p>11.6 details of required statutory notices and bye laws associated with the projects and site.</p> <p>11.7construction site layout</p> <p>11.8Temporary works</p> <p>11.9 Key Operations</p>	<p>Candidates to be guided on actual writing of various construction methodologies for bungalow, storey, commercial and industrial buildings.</p>	<p>Project details and descriptions.</p> <p>Possible Construction limitations with different projects and sites.</p> <p>Statutory and bye laws notices that could affect construction processes.</p> <p>Construction site layout.</p>	<p>Sample Construction Methodology written in the past.</p> <p>Building Production Management By Dr Ayo Bamisile</p> <p>Text Books on PPP</p> <p>NIOB Compendium</p>

General Objective 12: Buildability and Maintainability Analysis of Building Projects				
12	12.1 Discuss the objectives of Buildability and Maintainability Analysis report (BMAR). 12.2 Define BMAR 12.3 Outline the process of carrying out BMAR 12.4 Analyse a typical project and prepare a BMAR 12.5 Discuss the method through which costs can be reduced at BMAR stage.	Candidates to be guided through the scope of various important aspect of Building Production as a Professional Builder	Construction Industry Building Project Development Process Production of Management Document Construction Methodology Early Warning System Information Requirement Schedule	Textbooks on Building Production Management and NIOB Journals and Textbooks on Building Production
General Objective : BUILDING PRODUCTION MANAGEMENT				
13	13.1 Characteristics of the construction industry 13.2 Building Materials 13.3 Construction Professionals 13.4 Feasibility and Viability Study 13.5 Building Maintenance Manual 13.6 Building Maintenance 13.7 Environmental Impact Auditing 13.7 Managing the Production Process 13.8 Areas of Application of Building Production Management 13.9 Preparation of Production Managing Documents 13.10 Construction Methodology 13.11 Early Warning System Chart\ 13.12 Information Requirement Schedule 13.13 Managing the production process of Building Projects	Candidates to be guided through the scope of various important aspect of Building Production as a Professional Builder	Construction Industry Building Project Development Process Production of Management Document Construction Methodology Early Warning System Information Requirement Schedule	Textbooks on Building Production Management and NIOB Journals and Textbooks on Building Production
General Objective 14 : MAINTENANCE & FACILITIES MANAGEMENT				
14	14.1 Definitions of maintenance and Facilities Management 14.2 work place facilities management 14.3 Brief history of FM 14.4 Scope of Facilities Management - Maintenance operations. - Space utilization - Health and safety - Office Management - Traffic Management and law - Hospitality Management	Candidates to be guided through the scope of FM function and essentialities.	Definition of Facilities Management work place facilities management Brief history of FM Scope of Facilities Management - Maintenance operations. - Space utilization - Health and safety - Office Management - Traffic Management and law - Hospitality Management Etc.	Text Book on PPP NIOB Journals Text Books on Essential of Facilities Management

	Etc. 14.5 Difference between maintenance and facilities management			
General Objective 15: BUILDING SURVEYING TECHNOLOGY AND PRACTICE.				
15	<p>15.1 Definition of building Surveying</p> <p>15.2 Difference between building surveying and Maintenance Technology</p> <p>15.3 National Codes specifications on Building Surveying Practice.</p> <p>15.4 Qualifications to practice as a building surveying practitioners.</p> <p>1.5.5 Difference between structural investigation and building surveying.</p> <p>15.6 Methodology of inspection in building surveying.</p> <p>15.7 Health and safety practice associated with building surveying.</p> <p>15.8 Defects in Building.</p> <p>- foundations, walls, slabs, roof, concrete work,</p> <p>Building Plumbing, electrical work, Paintings, external works etc.</p> <p>15.9 Writing Technical reports for building surveyed.</p>	Candidates to be guided on complete preparation of different building surveying and their report writing.	<p>Candidates to know the definition of building surveying as provided by RICS and NIOB workshop on Building Surveying held in Kaduna in 2006.</p> <p>The difference between building surveying and maintenance.</p> <p>The difference between building surveying and structural investigation</p> <p>Methodology of inspection in building surveying.</p> <p>Technical report writing for a surveyed building.</p>	<p>NIOB workshop proceeding on Building Survey held in Kaduna in 2006.</p> <p>Textbook on Building Surveying.</p> <p>Text book on professional Practice and Procedures.</p>

PROGRAMME: MATURED/CORPORATE

COURSE CODE: MCE 602 / CE 503

COURSE TITLE: STAGE II & III

Modules	Topic	Mentor's Activities	Learning Outcome (Objectives)	Resources
1	Working experience (Log Book)	<p>Format of Presentation; Logbook filling skills – Language structure and writing skills, sketches and labeling, pictures, signing and stamping, summary of work, neatness and technical accuracy, and work description.</p> <p>The logbook must capture all sites activities on a weekly basis and the diagrams, sketches and photographs should directly describe the activities earlier stated.</p> <p>The logbook must cover a work experience of two years with all pages duly signed by the candidate, Mentor and Employers who is expected to also stamp the Logbook as required. The mentor supposedly must be a registered builder.</p> <p>Areas provided for personal information and work summary must be correctly filled.</p>	To demonstrate competence, proficiency, practical experience of professional skills garnered through years of active professional tutelage in building production process management.	<p>NIOB AND CORBON Publication on Builders Software;</p> <p>Dr S. G. Naoum (2007); Dissertation Research and Writing for Construction Students(2nd edition), Butterworth-Heinemann is an imprint of Elsevier Linacre House, Jordan Hill, Oxford OX2 8DP, UK The Boulevard, Langford Lane, Kiddlington, Oxford OX5 1GB, UK;</p> <p>All NIOB and CORBON publications on professional development and any other good research methodology book</p>
2	Technical Report	<p>1. Format of presentation – Arranged in chapters using the following order: Preliminary pages, chapter one (introduction), chapter 2(Practical work experience), chapter 3(Knowledge outcome and accomplishment), chapter 4 (Challenges, conclusion and recommendations): Each of the chapters should discuss:</p> <p>(i) Chapter one should primarily describe the company/ companies in which the candidate had the work experience: profile and scope; also, the candidate should discuss his/her work schedules in the company ;</p> <p>(ii) Chapter two should focus on the work done from inception to completion stating the job, construction methodology and procedure. If the project is more than one, they should be described separately;</p> <p>(iii) Chapter three should describe the actual knowledge gained by candidate and the accomplishments; and</p> <p>(iv) Chapter four is expected to describe the challenges, conclusions and recommendations as it relates to the candidate's experience on site. Challenges discussed here should be technical challenges and recommendations should be based on the solutions to the identified challenges.</p>		

		<ol style="list-style-type: none"> 2. Reporting skills – language structure, writing skills, work arrangement, and binding; and 3. Style of citation and references- intext citation and reference listing using APA latest edition. 4. All Certificates (workshops, mandatory Training program, seminars and Annual general meeting) should be attached to the Technical report as appendix (after chapter four) 5. In case of submission of Logbook and Technical report in soft copy, the documents should be well scanned and sent in PDF format not J peg 		
3	Oral Interview	<p>Appearance – Dressing Code; Questions and Answers – The way and manners to attempt to questions before the panelist.</p> <p>Continuing Mandatory Development Units – Minimum and Maximum unit required from State, National and CORBON.</p> <p>ICT Compliance</p> <p>Composure & Presentation</p>		

GRADE: CORPORATE				
COURSE TITLE: BUILDERS IN SOCIETY		COURSE CODE: CE 501	CONTACT HOURS:	
COURSE SPECIFICATION: THEORETICAL CONTENT			PRACTICAL CONTENT:	
Modules	Topics Covered	Mentor's Activities	Specific Learning Outcomes	Resources
1	1.1 Discuss different roles of registered builders 1.2 Discuss its role as a Consultant 1.3. Its roles as a building production managers 1.4 Its roles as a contractor's employee 1.5 Its roles as a Client employee 1.6 Its roles in preparation of the builders' documents: Buildability and Maintainability analysis report. Construction Methodology Construction programmes. Early warning signals. Project Quality management plan Project Health and safety plan.	Candidates to be mentored on the roles of registered builders	Candidates should be able practice effectively as a consultant, production managers, client employees as well as prepared all the builders documents	NIOB JOURNALS TEXT BOOKS on professional practice and procedures
2	2.1 Discuss in details professional practice with respect to the use of builders documents. 2.2 Constituents of Project Health and safety plan. 2.3 Constituents of Project Quality Management Plan 2.4 Constituents of Buildability and Maintainability analysis report. 2.5 Candidates should be able to use relevant software for preparation of Builders documents.	Candidates mentored through professional practice. Candidates will be guided to use applicable software proficiently.	Take the students through a real life use of Builders documents. Candidates to use a life drawings to prepare the documents.	Text book and other resource materials on Professional Practice and Procedure. Applicable software and lecture guide.
3	3.1 Discuss Procurement in relation to procurement act 2007 as amended. 3.2 Discuss the findings of committee set up by the FG on abandoned projects in Nigeria and the reasons for recommending new procurement Process. 3.3 Discuss the role of expression of interest in procurement and provisions of the act associated with its adverts. 3.4 Discuss Technical Bids in Procurement. 3.5 Discuss Financial Bids in Procurement. 3.6 Discuss opening of bids and the role of whistle blowers as outlined in the act.	Candidates to be mentored on Builders roles in procurement process.	Candidates to have comprehensive knowledge of the new procurement process and executive order 5 provision for exclusivity for involvement of professionals in contract execution in Nigeria.	Procurement Act 2007 Text book on PPP Rivers State 2019 workshop proceedings Lagos State 2019 AGM Proceedings. NIOB Journals / Compendium 1996-2019.

	<p>3.7 Discuss the clause that the lowest bids necessarily win the contract.</p> <p>3.8 Discuss the provision of the executive order 5 in contract execution.</p>			2018 Builders congress proceeding
4	<p>4.1 Define contract law</p> <p>4.2 Identify offers from acceptance</p> <p>4.3 Differentiates between invitation to treat and offer and its applicability to the building industry.</p> <p>4.4 Discuss 5 essentialities of a valid contract.</p> <p>4.5 Treat case studies with the 5 essentialities of a valid contract.</p> <p>4.6 Discuss JCT contract provisions.</p>	Candidates mentored through professional practice and relevant contract types.	Candidates should have good knowledge of contract types and relevant terminologies.	Text books on principles of contract law. Text books on PPP NIOB Journals
5	<p>5.1 Define Arbitration</p> <p>5.2 Discuss the Principles of Arbitration</p> <p>5.3 Provisions of arbitration clause in the contract documents</p> <p>5.4 Discuss the advantages of arbitration over conventional clauses.</p> <p>5.5 Qualification as an arbitrator.</p>	Candidates to be guided by their mentors On the various steps taken by NIOB and CORBON to promote arbitration in the building profession	Candidates understand the concept, principles and the advantages of arbitration to a conventional court. Candidates know who is qualified to be an arbitrator.	Text books on arbitration and professional practice and procedures. ..
6	<p>6.1 Discuss the developments of building regulations and bye laws from pre- colonial day to date.</p> <p>6.2 Define bye laws</p> <p>6.3 Define building regulations</p> <p>6.3 Evolution of Urban and Physical planning law .</p> <p>6.4 The roles of professional builders in the implementation of urban and Physical planning law at: - Federal level - State level</p> <p>Builders Instruments of enforcements of urban and physical planning law</p> <p>6.5 Discuss evolution of National building Codes from 1986 to 2006 when the first edition was released.</p> <p>6.6 Different code specifications for building components, operations and materials.</p> <p>6.7 Code requirements for builders' documents.</p> <p>6.8 Building Codes Enforcement Agency</p> <p>6.9 Compliance form and Builders responsibilities.</p>	Students will be guided on the use of builders documents as instruments of enforcements of urban and physical planning laws.	-Candidates will know the history of building regulation and bye laws from Lagos City - Building Bye laws and regulations and other associated laws in the colonial period. -Candidates will know about the federal Urban planning law of 1974. - Candidates will know about various states physical planning laws. -Builders documents as instruments of enforcements compliant.	Federal urban planning law act. State physical planning law edicts. NIOB Journals Text Books on Professional Practice and Procedures

			-National building codes evolution -Codes requirements for building production managements. -Materials components.	
7	7.1 Candidates to learn about the importance of NSQF to National Occupational skill agenda. 7.2 NIOB constitutional provision skills development 7.3. National building codes provisions that support skills development and relevance. 7.4 NIOB structures for artisans and craftsmen path for professional development. 7.5 Awarding status of NIOB 7.6. Who qualifies to be an assessor and Verifier?	Mentors will guide candidates to acquire necessary understanding For NSQF and the assessors and qualifiers training available for builders.	Candidates will know the roadmap developed for NSQF in Nigeria and the role of NIOB in it.	NIOB Publications. AGM proceedings for Oluyole Ibadan.

GRADE		CORPORATE		
COURSE TITLE: PROFESSIONAL PRACTICE AND PROCEDURE.		COURSE CODE: CE 502		
COURSE SPECIFICATION: THEORETICAL CONTENT				
Modules	Topics Covered	Mentor's Activities	Learning Outcomes	Resources
1	1.1 Define entrepreneurship developments. 1.2 Discuss process of entrepreneurship developments 1.3 Stages of entrepreneurship process 1.4 Characteristics of entrepreneurship developments. 1.5 Discuss different entrepreneurship opportunities in the building industry open to builders.	Candidates to be mentored of practical ways to distinguish their entrepreneurship ventures from general ones in the market.	Candidates should be able to identify entrepreneurship opportunities available in the building industry. e.g. Material Merchants Equipment Lessor Consultancy etc.	NIOB JOURNALS TEXT BOOKS on professional practice and procedures
2	2.1 Professionals Practice and Ethics. 2.2 Know about different professional associations and bodies backed by law to practice in Nigeria with their enabling acts. e.g. 2.3 NIOB-CORCON 2.4 NSE-COREN 2.5 NITP-TOPREC 2.6 NIA-ARCON 2.7 NIS-SURCON 2.8 NIQS-QSVRABON 2.9 NIESV-ESVABON 2.10 Knowledge about APBN.	Candidates will be guided through various stages of professional development such as evolution of NIOB from 1967, the approved structures, changes effected over the years and the current status quo.	Candidates will be able to understand the legal frameworks and responsibilities of the professional associations and bodies in Nigeria. Identify the difference between professional associations and professional bodies. Candidates will be familiar with laws setting up the bodies.	Various Acts establishing the professional bodies and their history as published by the associations and bodies. Published text books on the subjects. NIOB compendium and history of NIOB CORCON Act cap 40 LFN 2004
3	3.1 Define Project Management, differentiate different form of project, etc. 3.2 Discuss project planning and its difference from scheduling. 3.3 Relate Schedules to Work breakdown Structure s(WBS). 3.4 Discuss importance of construction scheduling. 3.5 Introduce use of relevant software to construction planning and management. 3.6 Initiating a project, Planning, execution, monitoring and closure. 3.7 Understanding Work Breakdown Structure 3.8 steps for creating a construction programme.	Candidates to be guided on the practical use of relevant software for project planning and monitoring.	Candidates should be capable of initiating a construction programme of a life project to closure	Relevant materials and publications on Project management, Project planning, Project scheduling, Steps for creating construction programme.
4	4.1 Problems of quality projects in Nigeria resulting to: - poor finishes - collapsed building - time and cost over run -poor standardization of materials	Candidates guided on live project preparation of PQMP using applicable software.	Preparation of Project quality Management Knowledge of Building codes specifications with respect to PQMP.	Text Book on PQMP. CORCON text book on PQMP

	<p>- Poor record keeping of activities on site.</p> <p>4.2 provision of NBC section 2.32 for quality management plan.</p> <p>4.3 Reasons for quality management plan.</p> <p>4.5 The role of compliance enforcement form on PQMP.</p> <p>4.6 Barriers to Quality Management Plan.</p> <p>4.7 How to overcome these barriers.</p> <p>4.8 benefits of improved quality project.</p> <p>4.9 Guidelines for preparation of PQMP.</p>		<p>Ability for record keeping on site.</p> <p>Use of compliance form on site.</p> <p>Knowledge of Barriers and benefits of PQMP.</p> <p>Guidelines to prepare PQMP.</p>	
5	<p>5.1 Define Site Organization</p> <p>5.2 Discussion on Work at Height</p> <p>5.3 Discuss First Aid Training for Work</p> <p>5.4 Discuss the content of First Aid Kit</p> <p>5.5 Discussion on How Good House Keeping Can be Life Saving in Construction</p> <p>5.6 Discuss on Safe and Unsafe Acts</p> <p>5.7 Discuss on potential Risk and Hazard on Construction Sites</p> <p>5.8 Discuss emergency response plan, Health and Safety Policy</p> <p>5.9 Discuss Health and Safety Meetings and Pep-talks on sites</p> <p>5.10 Accident investigation procedures</p> <p>5.11 Root cause analysis of incidents</p> <p>5.12 Provision of Insurance policy of Health and Safety issues on Sites.</p> <p>5.13 Use of relevant software for health and safety plan.</p>	<p>Candidate to be mentored on the use of Fire Extinguisher, Safe Keeping Acts</p>	<p>Candidate would understand Health and Safety application to Building Construction</p> <p>Candidate would understand how to prevent potential Risks & Hazard on site</p> <p>Candidate would understand the accident investigative procedures on site</p> <p>Candidate would understand how to make provision of Insurance Police on Construction Site</p> <p>Candidate would understand how to use appropriate tool for their work on site</p>	<p>Published textbooks/Journals on Health and Safety Management Plan.</p> <p>NIOB and CORBON textbook on H&SMP.</p>
6	<p>6.1 Define ICT in relation to building profession and discuss its application to building industry.</p> <p>6.2. Discuss benefits of ICT to Building Industry.</p> <p>6.3 Discuss relevant software's and applications useful to building industry.</p> <p>6.4 Evolving trends in ICT applications to building Industry.</p> <ul style="list-style-type: none"> - integrated projected delivery - BIM -BMS-Building Management System -Building Energy Management System- BEMS -Use of Drones in Construction -Use of CCTV in constructions. <p>6.5 ICT applications in preparations of builders' documents.</p>	<p>Candidates to be mentored on the use of applicable software for effectiveness and efficiency.</p>	<p>Candidates understand ICT applications to buildings, softwares and applications useful to the building industry.</p>	<p>NIOB JOURNALS</p> <p>TEXT BOOKS on professional practice and procedures.</p>
7	<p>7.1. Discuss the constituents of Project details</p> <p>7.2 Brief description of the project</p> <p>7.3 Basis of Construction Programme</p> <p>7.4 Analysis of construction Limitations</p>	<p>Candidates to be guided on actual writing of various construction methodology for bungalow, storey,</p>	<p>Candidates have full knowledge of : Project details and descriptions.</p>	<p>Building Production Management by Dr Ayo Bamisile</p>

	<p>7.5 Details of personnel involved in the project.</p> <p>7.6 details of required statutory notices and bye laws associated with the projects and site.</p> <p>7.7 construction site layout</p> <p>7.8 Temporary works</p> <p>7.9 Key Operations</p>	commercial and industrial buildings.	<p>Possible Construction limitations with different projects and sites.</p> <p>Statutory and bye laws notices that could affect construction processes.</p> <p>Construction site layout.</p>	<p>Text Books on PPP</p> <p>NIOB Compendium.</p>
8	<p>8.1 Discuss the objectives of Buildability and Maintainability Analysis report (BMAR).</p> <p>8.2 Define BMAR</p> <p>8.3 Outline the process of carrying out BMAR</p> <p>8.4 Analyze a typical project and prepare a BMAR</p> <p>8.5 Discuss the method through which costs can be reduced at BMAR stage.</p>	Candidates to be guided through preparation of BMAR of a live project	<p>Knowledge of BMAR</p> <p>-Process of BMAR</p> <p>-Analysis of A project using BMAR</p> <p>-Cost reduction method at BMAR stage.</p>	<p>Text Book on PPP Building Production Management by DR Ayo Bamisile</p> <p>NIOB Compendium from 1996-2019</p>
9	<p>9.1 Characteristics of the construction industry</p> <p>9.2 Building Materials</p> <p>9.3 Construction Professionals</p> <p>9.4 Feasibility and Viability Study</p> <p>9.5 Building Maintenance Manual</p> <p>9.6 Building Maintenance</p> <p>9.7 Environmental Impact Auditing</p> <p>9.7 Managing the Production Process</p> <p>9.8 Areas of Application of Building Management</p> <p>9.9 Preparation of Production Managing Documents</p> <p>9.10 Construction Methodology</p> <p>9.11 Early Warning System Chart</p> <p>9.12 Information Requirement Schedule</p> <p>9.13 Managing the production process of Building Projects</p>	Candidates to be guided through the scope of various important aspect of Building Production as a Professional Builder	<p>Construction Industry Building Project Development Process</p> <p>Production of Management Document</p> <p>Construction Methodology</p> <p>Early Warning System Information</p> <p>Requirement Schedule</p>	Textbooks on Building Production Management and NIOB Journals and Textbooks on Building Production
10	<p>10.1 Definition of Facilities Management</p> <p>10.2 work place facilities management</p> <p>10.3 Brief history of FM</p> <p>10.4 Scope of Facilities Management</p> <ul style="list-style-type: none"> - Maintenance operations. - Space utilization - Health and safety - Office Management - Traffic Management and law - Hospitality Management Etc. 	Candidates to be guided through the scope of FM function and essentialities.	<p>Definition of Facilities Management</p> <p>work place facilities management</p> <p>Brief history of FM</p> <p>Scope of Facilities Management</p> <ul style="list-style-type: none"> - Maintenance operations. - Space utilization - Health and safety - Office Management - Traffic Management and law - Hospitality Management. 	<p>Text Book on PPP</p> <p>NIOB Journals</p> <p>Text Books on Essential of Facilities Management.</p>
11	<p>11.1 Definition of building Surveying</p> <p>11.2 Difference between building surveying and Maintenance Technology</p> <p>11.3 National Codes specifications on Building Surveying Practice.</p> <p>11.4 Qualifications to practice as a building surveying practitioner.</p>	Candidates to be guided on complete preparation of different building surveying and their report writing.	Candidates to know the definition of building surveying as provided by RICS and NIOB workshop on Building Surveying held in Kaduna in 2006.	<p>NIOB workshop proceeding on Building Survey held in Kaduna in 2006.</p> <p>Textbook on Building Surveying.</p>

	<p>11.5 Difference between structural investigation and building surveying.</p> <p>11.6 Methodology of inspection in building surveying.</p> <p>11.7 Health and safety practice associated with building surveying.</p> <p>11.8 Defects in Building. - foundations, walls, slabs, roof, concrete work, Building Plumbing, electrical work, Paintings, external works etc.</p> <p>11.9 Writing Technical reports for building surveyed.</p>		<p>The difference between building surveying and maintenance.</p> <p>The difference between building surveying and structural investigation</p> <p>Methodology of inspection in building surveying.</p> <p>Technical report writing of for a surveyed building.</p>	<p>Text book on professional Practice and Procedures.</p>
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PROGRAMME: GRADUATE

COURSE CODE: GE 401

COURSE TITLE: CONSTRUCTION TECHNOLOGY II

Modules	Topics Covered	Mentor's Activities	Learning Outcomes	Resources
1	<p>Structural forms as determinants of Construction Technology</p> <p>1.1 Discuss structural forms in reinforced concrete; steels and wood;</p> <p>1.2 Basic Principles and Techniques; and</p> <p>1.3 its Production processes.</p>	Candidates to be mentored on Structural forms as determinants of Construction Technology	Candidates should be able to understand Structural forms as determinants of Construction Technology.	JOURNALS and TEXT BOOKS on Construction Technology
2	<p>Modular and Dimensional coordination in Building Construction</p> <p>2.1 Modular coordination of designs;</p> <p>2.2 Tolerances;</p> <p>2.3 Fit in industrialized building production; and</p> <p>2.4 Dimensional coordination</p>	Candidates to be mentored on Modular and Dimensional coordination in Building Construction	Candidates should be able to understand Modular and Dimensional coordination in Building Construction	JOURNALS and TEXT BOOKS on Construction Technology
3	<p>Special Structures</p> <p>3.1 Tall structures;</p> <p>3.2 Spatial structures;</p> <p>3.3 Pre-stressed structures; Tunnels (including blasting and drilling);</p> <p>3.4 Construction of roads/pavements, Airport runways;</p> <p>3.5 Simple bridges;</p> <p>3.6 Towers and</p> <p>3.7 Safety measures in special structures.</p>	Candidates to be mentored on Special Structures	Candidates should be able to understand Special Structures	JOURNALS and TEXT BOOKS on Construction Technology
4	<p>Modern Materials and Equipment used in Special Constructions</p> <p>4.1 identification & application of modern or innovative materials in building construction (e.g. Self-healing concrete);</p> <p>4.2 Manufacturing processes of modern materials; essentials requirements; challenges and implication;</p> <p>4.3 Classification of construction plants and equipment's;</p> <p>4.4 factors affecting its choice and utilization;</p> <p>4.5 Safety measures in the utilization of construction plants and equipments</p>	<p>To provide a coherent development to the students for the courses in sector of Advanced construction technology; and</p> <p>To present the new technology of Building Construction and its related Technology.</p>	Provide a coherent development to the students for the courses in sector of Advanced construction technology; and Present the new technology of Building Construction and its related Technology.	JOURNALS and TEXT BOOKS on Construction Technology

5	Construction of Disaster Resilient and Resistant Buildings: 5.1 Principles of resilient and resistant buildings; 5.2 Planning and/or designs of resilient and resistant building; 5.3 Construction of walls –provision of corner reinforcement; 5.4 Construction of beams and columns; and 5.5 Base isolation	Candidates to be mentored on Construction of Disaster Resilient and Resistant Buildings	Candidate will understand the Construction of Disaster Resilient and Resistant Buildings	JOURNALS and TEXT BOOKS on Construction Technology
6	Temporary Works 6.1 Form work for R.C.C. wall, slab, beam and column, 6.2 Centering for arches of 6.3 large spans and dams, design features for temporary works, 6.4 Slip formwork, 6.5 False work for bridges, Specialty form work such as caisson and cofferdam	To study construction equipments, and temporary works required to facilitate the construction process;	Candidate will gain knowledge construction equipments, and temporary works required to facilitate the construction process;	JOURNALS and TEXT BOOKS on Construction Technology

PROGRAMME: GRADUATE EXAMINATIONS				
COURSE TITLE: STRUCTURAL THEORY AND DESIGN II		COURSE CODE: GE 402		CONTACT HOURS:
GOAL: TO EQUIP CANDIDATES WITH COMPETENCIES IN THE ANALYSIS AND DESIGN OF BUILDING STRUCTURES UP TO 4-STOREY				
COURSE SPECIFICATION: THEORETICAL CONTENT			PRACTICAL CONTENT	
Module	Topic	Mentor's Activities	Specific Learning Outcome	Resources
General Objective 1: DEFLECTION OF BEAMS.				
1.	Different methods of determining deflection in beams.	1.1 Discuss beam deflection in structural design 1.2 Establish relation between slope, deflection and radius of curvature 1.3 Explain sign conventions used in deflection of beams 1.4 Determine maximum slope and deflection using double integration method. 1.5 Determine maximum slope and deflection using Macaulay's method. 1.6 Determine maximum slope and deflection using moment area method.	Candidates should be able to calculate beam deflection.	TEXT BOOKS on Strength of Materials or Structural Analysis
General Objectives 2: STRESSES IN BEAMS				
2.	.Theory of simple bending, section modulus, combined axial and bending stresses, stresses on inclined planes, and compound stresses.	2.1 Discuss on theory of Simple Bending (Bending equation) 2.2 Discuss on Neutral axis and Section Modulus.. 2.3 Reinforced concrete beam – Rectangular section. 2.4 Combined direct and bending stresses – loading acting eccentrically to one axis, earth pressure on retaining wall 2.5 Discuss on stresses on inclined planes 2.6 Mohr's Circle of stress 2.7 Discuss on compound stresses in beams.	Candidates should Know how to derive simple bending equation, use Mohr's Circle in determining stresses on an inclined plane, and able to determine normal and tangential stresses in a given compound stresses..	TEXT BOOKS on Strength of Materials or Structural Analysis
General Objectives 3: BUILT – IN (OR FIXED) AND CONTINUOUS BEAMS				
3.	Analysis of Fixed beams and Continuous beams.	3.1 Analyse fixed beam carrying different loading conditions. 3.2 Analyse fixed beam with ends at different levels (effect of Sinking supports). 3.3 Analyse continuous beam of unequal spans carrying both point and uniformly distributed load over its spans – using Clapeyron's three moment equation..	Candidates should Know how to analyze fixed and continuous beams of different spans and loadings.	TEXT BOOKS on Strength of Materials or Structural Analysis

General Objective 4: ANALYSIS OF STATICALLY INDETERMINATE STRUCTURES				
4.	The candidates will learn Statically indeterminacy, methods of analyzing statically indeterminate structures	4.1 Discuss degree of statically indeterminacy. 4.2 Explain Kinematic indeterminacy 4.3 Discuss on statically indeterminate beams 4.4 Discuss on statically indeterminate trusses 4.5 Discuss on Portal frames 4.6 Explain the use of slope – deflection method. 4.7 Explain the use of moment distribution method. 4.8 Discuss Flexibility or Force method of analysis	Candidates should be able to analyse statically indeterminate structures by the use of slope – deflection method, moment distribution method, and other methods.	TEXT BOOKS on Strength of Materials or Structural Analysis.
General Objective 5: COLUMNS AND STRUTS				
5.	Types of columns, strength and end conditions of columns, and Theories associated with columns	5.1 Introduction and Definitions 5.2 Classification of Columns 5.3 Theory of Columns – bending accompanied by tension or compression 5.4 Discuss end conditions and Equivalent length of columns 5.5 Columns subjected to eccentric loading 5.6 Beam Columns 5.7 Euler’s Theory, applicability and formula 5.8 Rankine’s Hypothesis for columns and struts. 5.9 Long Columns.	The candidates should be able to calculate the equivalent of a column as well as their different end conditions; the candidate should know when and how to use Euler’s formula in analyzing columns.	TEXT BOOKS on Strength of Materials or Structural Analysis
General Objectives 6: LIMIT STATE APPROACH IN REINFORCED CONCRETE DESIGN TO EUROCODES				
6.	Types of Limit state; various Standards used in design of reinforced concrete structure; dead, imposed and wind loads; design load; partial factors of safety	6.1 Explain the object of Limit State Design. 6.2 Explain the use of relevant Codes and Standards in the design of reinforced concrete structure 6.3 Limit state characteristic material strength and safety and design loads. 6.4 Explain ultimate limit state as a probabilistic approach to design.. 6.5 Explain dead loads, imposed loads and wind loads 6.6 Explain partial factors and global factors of safety. 6.7 Explain Serviceability Limit state. 6.8 Calculate design load for ultimate and Serviceability Limit states. 6.9 Explain Serviceability Limit state in terms of deflection, cracking, durability, fire resistance, vibration and fatigue..	The candidates should be able to compute the design load to be used in the analysis	TEXT BOOKS on Reinforced Concrete Design to Euro codes, Euro codes (loosely called Euro code 0), Euro codes 1 and Euro codes 2 are essential here.

General Objectives 7: STRESS – STRAIN RELATIONSHIP FOR CONCRETE AND STEEL				
7.	Stress – strain relationship of concrete and steel; bar sizes and grades; strengths and grades of concrete.	7.1 Explain creep and shrinkage of concrete 7.2 Explain Short-term design stress-strain curve for concrete in compression. 7.3 Explain Short-term design stress-strain curve for steel. 7.4 Illustrate bar shape and sizes, grades and strength of concrete and reinforcement.	The candidates should be able to apply the derived formula in reinforced concrete design.	TEXT BOOKS on Reinforced Concrete Design to Euro codes. Euro codes (loosely called Euro code 0), Euro codes 1 and 2 are essential here.
General Objectives 8: DESIGN OF REINFORCED CONCRETE RECTANGULAR BEAMS				
8.	Preliminary sizing of beam, bar spacing rules, a minimum amount of longitudinal bar required; check for deflection, shear and anchorage bond; design of continuous beam; and detailing of reinforcement.	8.1 Explain the behavior of reinforced concrete beam section. 8.2 Carry out preliminary analysis and member sizing. 8.3 Explain Bar spacing rules 8.4 Calculate the moment of resistance for a single and double reinforced sections 8.5 Calculate minimum amount of longitudinal bars and stirrups. 8.6 Design for shear, bond anchorage and check for deflection 8.7 Design a continuous beam. 8.8 Illustrate standard detailing practice and draw beam section and elevation. 8.9 Describe curtailment of bars 9.0 Carry out reinforcement detailing	Candidates should be able to identify continuous beam from real drawing and design appropriately, and also provide detail drawing.	TEXT BOOKS on Reinforced Concrete Design to Eurocodes. Eurocodes (loosely called Eurocode 0), Eurocodes 1 and Eurocodes 2 are essential here.
General Objectives 9: DESIGN OF SOLID SLABS AND STAIRS				
9.	Preliminary sizing of slab; one – way and two- ways spanning slab; shear, local bond and distribution bars; designing of horizontal and longitudinal staircases; detailing of slab and staircase.	9.1 Preliminary sizing of slabs using span – effective depth ratio. 9.2 Design slab spanning in one direction. 9.3 Design slabs spanning in two directions. 9.4 Calculate shear, punching shear, local bond and distribution steel. 9.5 Analyse two – way reinforced concrete slab using the yield line theory 9.6 Describe stairs spanning horizontally 9.7 Describe stairs spanning longitudinally 9.9 Design Spiral and Cantilever Stairs from spine beam. 10 Detail slabs and staircases.	Candidates should be able to analyze and design slabs and staircases as well provide drawing details of them.	TEXT BOOKS on Reinforced Concrete Design to Eurocodes. Eurocodes (loosely called Eurocode 0), Eurocodes 1 and 2 are essential here.
General Objectives 10: DESIGN OF COLUMNS AND FOUNDATIONS				
10.	Classes of columns, design of short and slender columns; design of pad footings, combined footing, raft and pile foundations; detailing of columns and foundations	10.1 Loading and Moments on Columns. 10.2 Discuss on column classification and failure mode and load carrying mechanism – axial, uniaxial and biaxial. 10.3 Reinforcement details 10.4 Design of short column. 10.5 Uniaxial and Biaxial bending of columns	Candidates should be able to design and detail columns, pad, combined and strip footings, raft and pile foundations.	TEXT BOOKS on Reinforced Concrete Design to Eurocodes. Eurocodes (loosely called Eurocode 0), Eurocodes 1 and 2 are essential here, including

		10.6 Design of slender column. 10.7 Design of pad footings. 10.8 Analyse and design of combined and strip footings. 10.9 Design of Raft foundation 10.10 Design of Pile foundation and pile caps.. 10.11 Design of Multi-storey buildings including shear walls.		relevant sections of Eurocode 7.
General Objectives 11: DESIGN OF STEEL AND TIMBER STRUCTURES				
11.	Design of Steel and timber Structures including connections – bolted, riveted, welded and nailed connections for timber.	11.1 Standards and Codes for design of steel and timber Structures. 11.2 Production and Behavior of steel and timber members. 11.3 Criteria for selection of structural steel and timber. 11.2 Analysis of steel and timber structural members Including shearing forces and bending moments. 11.3 Design stresses for various types of steel and timbers. 11.4 Design of steel members – beams, columns, composite Structures and steel trusses. 11.5 Design of timber members – joists, beams, columns, and Timber trusses. 11.6 The use of steel forms in multi-storey buildings. 11.7 Design of connections – bolted, riveted and welded connections for steel and timber and also nailed Connection for timber. 11.8	Candidates should be able to design and detail steel and timber members including trusses in both materials.	TEXT BOOKS on Steel and Timber Design to Eurocodes especially Eurocode 3.

COURSE TITLE: PROJECT MANAGEMENT CORSE CODE: GE403 CONTACT HOURS:

Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1	<p>1.1 Discuss the concept of Construction Project Management</p> <p>1.2 Explain the History of Project Management</p> <p>1.3 Discuss Project Management in the Past and Present Situation</p> <p>1.4 Explain the concept of a Project and its characteristics</p> <p>1.5 Discuss what is Project Integration</p> <p>1.6 Discuss Project constraints of cost, time, quality and scope</p> <p>1.7 Explain the interpersonal skills needed for a construction project</p> <p>1.8 Define Project Life Cycle, organization and characteristics of project phases</p> <p>1.9 Discuss the factors that affect construction work</p>	<p>Candidates should be able to know the concept of project management</p> <p>Understand the history of project management</p> <p>Know the past and present situations of project management</p> <p>Identify what a project is and its characteristics</p> <p>Understand project integration from personal skills required, life cycle and various phases of a project.</p> <p>Know the various factors that can affect a construction project.</p>	<p>Candidate should be able to understand the concept of construction project management.</p> <p>Understand the history of project management.</p> <p>Know the past and present developments in project management.</p> <p>Discuss on the Interpersonal Skills needed for Construction projects</p> <p>Define Project Life Cycle and Organisation</p> <p>Understand the concept of a project, its characteristics and various stages of Project Phases.</p> <p>Know factors that can affect construction works.</p>	<p>Published textbooks on Construction Project Management.</p>
2	<p>2.1 Discuss on how construction project is initiated from client to Architect and Project Manager involvements.</p> <p>2.2 Explain and develop a Project Charter</p> <p>2.3 Explain who are construction stakeholders and their importance in construction project</p>	<p>Candidates should be able to know how a construction project is initiated.</p> <p>Understand and develop a project charter</p> <p>Explain who are stakeholders and their importance in construction projects.</p>	<p>Candidate should be able to initiate a Construction Project</p> <p>Develop a Project Charter</p> <p>Manage Construction Stakeholders</p> <p>Identify Stakeholders in Construction Work</p>	<p>Project management textbook on project initiation and stakeholder management.</p>
3	<p>3.1 Explain the scope of a construction project.</p> <p>3.2 Discuss on Project activities, their sequencing and resources required for estimating activity durations.</p> <p>3.3 Discuss on methods of obtaining the cost of the project, estimate for the project and obtaining the budget.</p> <p>3.4 Discuss on the importance of project quality and how to manage quality on a project.</p>	<p>Candidates should be able to plan the scope of a project .</p> <p>Understand how project activities are sequenced and their durations estimated.</p> <p>Know how project costs are estimated and budgeted for.</p> <p>Understand project quality and its management on a project.</p> <p>Know the human resources required on a project and how they're managed.</p>	<p>Candidate should be able to plan a project and define the scope.</p> <p>Develop the scope of the project.</p> <p>Collect requirements needed for planning the project.</p> <p>Define the project activities and sequence the various construction activities and estimate their durations.</p>	<p>Project management textbook on cost management, quality management, construction planning and scheduling, procurement management, risk management and financial management.</p> <p>Bills of Quantities of previous projects.</p>

	<p>3.5 Explain human resources required on a project and its management.</p> <p>3.6 Discuss on project communication and its management.</p> <p>3.7 Discuss on Project risks, how risks are identified and managed on a project.</p> <p>3.8 Explain the importance of procurement management in a project and its management.</p> <p>3.9 Discuss on Project Stakeholders and its management on a project.</p> <p>3.10 Explain construction Safety and its management on a project.</p> <p>3.11 Discuss on financial management on a project and its importance to a project management.</p> <p>3.12 Discuss on project team and methods of managing the team.</p> <p>3.13 Discuss on methods of managing communication and stakeholder engagement in construction project.</p>	<p>Understand the various types of project communications in use and how they are utilized for project.</p> <p>Understand various types of risks encountered on a project and its management.</p> <p>Know the various methods used in procurement management, its tools, documentations and closing the procurement.</p> <p>Understand stakeholders, their management and importance to construction project.</p> <p>Know the methods of providing safety in construction projects.</p> <p>Understand financial management and its importance to construction project.</p>	<p>Estimate the resources needed for the activities. Develop the Project Schedule</p> <p>Plan for project Cost and also estimate the project costs.</p> <p>Determine the project Budget</p> <p>Plan to manage construction project Quality</p> <p>Determine the various human resources required on the project and its management.</p> <p>Determine the project Communication used and its management.</p> <p>Identify the various types of project risks encountered and its management.</p> <p>Understand the various methods of procurement management, its tools, and documents and how to close the procurement.</p> <p>Understand the various stakeholders and stakeholder engagement in construction project.</p> <p>Understand construction safety and its management</p> <p>Understand financial Management in construction project</p> <p>Know project claim management.</p>	<p>Past project programme of work.</p> <p>Past project safety documents and quality documents.</p> <p>Past project financial budgets and cash flow documents.</p>
4	<p>4.1 Explain the tools for monitoring and controlling construction projects.</p> <p>4.2 Discuss the methods of controlling scope, quality, schedule, risk and stakeholder engagement in construction project.</p> <p>4.3 Discuss methods of controlling finances and prevent claims on construction projects.</p>	<p>Candidates should be able to know the various methods and tools for controlling and monitoring construction projects.</p> <p>Know the methods of controlling scope, quality, schedule, risks and stakeholder engagements.</p> <p>Understand the methods of controlling finances and preventing claims on construction projects.</p>	<p>Candidate should be able to monitor the progress of construction project</p> <p>Control construction project Scope</p> <p>Understand methods of controlling construction schedule, scope, risks and stakeholder engagement.</p> <p>Know the various methods Financial management and preventing claims in construction projects.</p>	<p>Project management textbook on project control and monitoring.</p> <p>Controlling scope, quality, schedule, risk and stakeholder management in construction projects.</p>

5	<p>5.1 Discuss on how to close the construction project.</p> <p>5.2 Explain the process of auditing procurement.</p> <p>5.3 Discuss on the methods of performing financial administration and records.</p> <p>5.4 Discuss on the methods of resolving claims on construction projects.</p>	<p>Candidates should be able to know how to close a construction project.</p> <p>Understand the processes of carrying out auditing of procurement.</p> <p>Know the methods of performing financial administration and keeping records.</p> <p>Know the methods of resolving claims.</p>	<p>Candidate should be able to close a construction project.</p> <p>Should be able to close procurements of construction projects.</p> <p>Should be able to audit procurement of construction projects.</p> <p>Perform financial administration of construction projects and provide the records.</p> <p>Should be able to resolve claims on construction projects.</p>	<p>Project management textbook on closing of projects, auditing of procurement, performing of financial management and resolving claims.</p>
6	<p>6.1 Discuss developments in management theory</p> <p>6.2 Discuss Classical and Human Relations theories of management</p> <p>6.3 Discuss System and Contingency theories of management</p> <p>6.4 Explain theories of organization, administration and bureaucracy as well as their relationships</p> <p>6.5 Discuss the meaning of management and its processes</p> <p>6.6 Discuss Authority and various theories of Leadership in management</p>	<p>Candidates should be able to know the various developments in management and its contributors.</p> <p>Understand the concepts of Classical and Human Relations Schools.</p> <p>Know and understand ideas of organization, administration, bureaucracy, authority and Leadership in management.</p>	<p>Candidates will be able to know the developments and contributions to management theories.</p> <p>Understand the meaning and processes of management.</p> <p>Understand the concept of organization, administration, authority and bureaucracy as well as leadership in modern organizations.</p>	<p>Published textbooks in management theory and Practice.</p> <p>Show organograms of various existing companies to indicate the organizational profiles, Hierarchies of Authorities, functions of Departments and their authorities within such organizations</p>
7	<p>7.1 Discuss Strategic aspects of management in organizations</p> <p>7.2 Explain the concepts of Objectives, Policies, culture and norms in organizations.</p> <p>7.3 Discuss Strategic management applications in organizations, corporate planning and Decision making techniques.</p> <p>7.4 Explain the concept of Risks, uncertainties and probabilities in construction projects.</p>	<p>Candidates should be able to understand strategic management, corporate objectives, and management by objectives. Policies and culture of organizations.</p> <p>Should know how company strategies transform into objectives.</p> <p>Know the various sources of risks in construction projects and their methods of management.</p>	<p>Candidates to understand that organizations have strategic plan, objectives, culture and norms.</p> <p>Know what is corporate objectives, corporate planning. Decision making processes.</p> <p>Know that risks are abound in construction projects and the management of such risks using contingency funds and provisional sums in Bill of Quantities.</p>	<p>Published textbooks on Management theory and practice.</p> <p>Use some Existing Construction companies Profiles to study their company strategies, corporate objectives.</p> <p>Request candidates to identify some risky events on their recently completed construction projects.</p>

	7.5 Identify various types of Risks in construction and the methods of managing the risks through risk identification, classification, analysis, attitude and response.			
8	<p>8.1 Discuss Concept of Work Study, Productivity and Productivity improvement processes in construction.</p> <p>8.2 Explain Construction time, method study work measurement.</p> <p>8.3 Discuss the use of records, multiple activity process and activity sampling techniques in recording productivity process.</p> <p>8.4 Explain the use of flow diagrams, string diagrams, and Activity symbols in studying productivity on site.</p> <p>8.5 Discuss the process of work measurement in construction.</p> <p>8.6 Explain the concept of incentive schemes in construction and various types of motivators and de-motivators.</p> <p>8.7 Explain the applications of method study and work measurement to forecasting, Analytical Estimating, Planning, Motivation through incentive schemes in construction.</p>	<p>Understand the concepts of Work study as method study and work measurement. Understand Productivity and its measurements.</p> <p>Know methods of recording productivity and various productivity improvements required.</p> <p>Use Activity symbols to construct flow and String diagrams of some productive process.</p>	<p>Candidates to understand work study as method study and work measurement in productivity.</p> <p>Know productive times and non- productive or idle time.</p> <p>Know methods of studying productivity through flow string diagrams.</p> <p>Understand use of incentives in construction projects and various motivators and demotivators.</p> <p>Know the applications of work study to Estimating, planning and incentives scheme operations in construction.</p>	<p>Published textbooks on Construction Management explaining Work study, Productivity improvement processes and incentive schemes.</p>
9	<p>9.1 Explain the concept of Operations Research in management.</p> <p>9.2 Discuss the problems of Operations Research in Stock Control, Allocation of resources through Assignments and Transportation, Routing, Queuing, Replacement and Maintenance.</p> <p>9.3 Discuss the problems of Operations Research in Network Analysis, PERT and Linear programming.</p> <p>9.4 Applying Operations Research principles in solving management problems in Decision trees, Queues,</p>	<p>Know the concept of Operation Research, its origin, objectives and the need for it in decision making in management.</p> <p>Know the Operations Research theories in Decision Trees, Queues, Routing, Replacement and Stock Control.</p> <p>Know the Operations Research theories in Linear Programming, Assignment, Transportation, Network Analysis and PERT.</p>	<p>Know the origin, developments and contributions of Operations research to management.</p> <p>Understand the theories of Operations research in Stock Control, Routing, Decision Trees, Queues , Linear programming, Assignment and Transportation.</p> <p>Understand the theories of operations research in Network Analysis, PERT, and other areas.</p>	<p>Published textbooks on Operations Research or Management Science.</p>

	Routing, Replacement, stock control, Network Analysis and Linear Programming.	Solve management problems in Decision Trees, Queues, Routing, Replacement and Stock Control and other areas.		
10	<p>10.1 Discuss Pre-tender and Contract planning processes and procedures in submitting an estimate for a construction job.</p> <p>10.2 Discuss Project planning techniques using bar charts, Network diagrams and use of applicable software for project planning.</p> <p>10.3 Discuss on Quality management in Projects using quality planning, quality Assurance and Quality Control</p> <p>10.4 Explain Construction Contracts as Agreements between parties such as clients, consultants and contractors.</p> <p>10.5 Discuss the various types of Contract systems in use in construction such as Lump Sum, Measurement contracts, Cost Reimbursement, Cost plus and others and indicating their uses and their implications in contract systems.</p>	<p>Know processes and procedures of conducting Pre-tender and contract planning.</p> <p>Understand how estimates are prepared, adjudicated by management for a tender.</p> <p>Know how to prepare work programmes using bar charts, Network diagrams and relevant planning software.</p> <p>Know how to prepare project Quality plan and use Quality Assurance and Control for managing quality on construction projects.</p> <p>Know the various types of Construction contracts in use.</p> <p>Examine Article of Agreements prepared for building contracts, the roles of the parties and their obligations under the contract.</p>	<p>Know how to prepare Pre-Tender and contract plans.</p> <p>Know how to prepare Job Estimates and work programmes.</p> <p>Know the contract types and their implications for contract agreements.</p> <p>Know the obligations and responsibilities of various parties to the building contract.</p>	<p>Examine some Planning activities submitted by some companies for Pre-tender and contract planning.</p> <p>Prepare quality plan for some new projects to be undertaken.</p> <p>Examine some contract documents for agreements and party obligations.</p>

PROGRAMME: GRADUATE				
COURSE TITLE: MAINTENANCE		COURSE CODE: GE 404	CONTACT HOURS:	
GOAL: TO EQUIP CANDIDATES WITH KNOWLEDGE OF BUILDING MAINTENANCE MANAGEMENT IN PRACTICE				
COURSE SPECIFICATION: THEORETICAL AND PRACTICAL CONTENT				
General Objective 1: Have a general knowledge about of Building repair and Maintenance				
MODULES	TOPICS	MENTOR'S ACTIVITY	SPECIFIC LEARNING OUTCOMES	RESOURCES
1	1.1 Definition of maintenance 1.2 Objective of maintenance 1.3 Significance of maintenance 1.4 Factors influencing maintenance 1.5 Types of maintenance 1.6 Economic consideration 1.7 Maintenance and national economy	Candidates should be taken through the rudiments of maintenance and how it affects our lives.	Candidates will be able to understand the importance of building repairs and maintenance , factors to be considered during building maintenance and the effect of maintenance on national economy	Textbooks on: Maintenance management, maintenance Technology , construction economics, building economics
General Objective 2 : Have a general knowledge on Principles of Maintenance Management and Quality Assurance				
2	2.1 Functions of Organizational structure 2.2 Maintenance workforce 2.3 Information management and communication system 2.4 Property inspection and reports 2.5 Maintenance Budget estimates 2.6 Specifications for adaptation and Maintenance works 2.7 Health and Safety requirements in maintenance 2.8 Quality maintenance 2.9 Life expectancy of Building 2.10 Maintenance manual	Candidates should be guided on the concept of maintenance management, durability and quality as it affects the building and its usage.	Candidates will be able to understand the basic issues in Building Maintenance management and Quality assurance, dealing with maintenance options, Data collection and record keeping for maintenance, preparation of budget for maintenance work, Safety	Textbooks on: Maintenance management, maintenance Technology, construction economics, building economics, Health and safety in the construction industry, Quality assurance and management.
General Objectives 3: Have a general knowledge on Agencies causing Deterioration				
3	3.1 Mechanism of deterioration 3.2 Effect of deterioration on Building materials 3.3 Deterioration and building performance 3.4 Sick Building syndrome	Candidates should be taught deterioration and its effects on building and its performance. They also need to know the effect of building deterioration on the activities and health of occupants	Candidates will be able to understand Deterioration, causes of Building deterioration, effect of deterioration on building performance.	Textbooks on: Building Materials science, maintenance Technology, construction technology
General Objective 4: Have a general knowledge on investigation of defects in building				
4	4.1 Systematic approach of investigation 4.2 Scope and objectives of investigation 4.3 Preliminary considerations 4.4 Detail steps for diagnosis of defects	Candidates will be guided through the design, use, and management of investigation	Candidates will be able to have the understanding of the fundamentals of Defects investigation in Buildings, get familiar with building diagnosis, material testing	Text books on: Building Diagnosis, reports of building investigation.

	4.5 physical measurement 4.6 Material testing 4.7 Building diagnosis 4.8 Retrospective analysis 4.9 Confirmation of Diagnosis	procedure and the use of tools and equipment to diagnose some common defects in Building.	Candidates should be able to have the understanding of the various types of tools and equipment used to investigate Building defects, candidates should also be familiar with material testing using destructive and non-destructive methods	Tools and Equipment used in building investigation. Building Materials science, maintenance Technology, construction technology, Building survey and report, Building material Testing,
General Objective 5: Have a general knowledge on Maintenance problem and root causes				
5	5.1 Cause of defects 5.2 Investigation of Dampness 5.3 Settlement 5.4 Cracks 5.3 Report	Candidates should be guided on the applications, use and operational requirements of tools and equipment necessary to investigate Dampness in building	Candidates will be able to know some specific maintenance problems and their root causes Candidates will be able to carry out building diagnosis and write a detailed building investigation report	Textbooks on: Building Materials science, maintenance Technology, construction technology, Building survey and report, Building material Testing, Common tools and equipment used in diagnosing dampness in building
General Objective 6: Have the knowledge of common materials and Techniques for Repair and maintenance				
6	6.1 Timber 6.2 Concrete 6.3 Glass 6.4 Ceramics 6.5 Steel 6.6 Clay 6.7 Composite 6.8 Fabrics	Candidates should be guided on how to study material, their common defects and how to arrive at the most appropriate repair techniques.	Candidates should understand the behavior of common materials used in building to natural and artificial agencies and should understand how they can be protected against deterioration. Candidates should also know how to repair defects in the materials	Text books on Buildings and deterioration, Building Services,, Building and Environmental Science, Repair Techniques in maintenance
General Objective 7: Have a general knowledge about preventive maintenance and special precautions necessary for maintenance				
7	7.1 Preventive maintenance consideration 7.2 Sweeping and washing 7.3 Joint maintenance 7.4 Dusting Floors 7.5 Termite control 7.6 Damp roofing of existing Roof and wet areas 7.7 water supply and sanitary system 7.8 Special precautions for repair of buildings	Candidates should be guided on how to plan and execute preventive maintenance plan for buildings	Candidates will be able to understand the importance of preventive maintenance and special precautions necessary for maintenance works	Textbooks on: Maintenance management, maintenance Technology , Construction Technology, and Building services

PROGRAMME: GRADUATE				
COURSE TITLE: COMPUTER APPLICATION IN BUILDING		COURSE CODE: GE405	CONTACT HOURS:	
GOAL: TO EQUIP CANDIDATES WITH COMPETENCIES IN COMPUTER APPLICATION IN BUILDING				
COURSE SPECIFICATION: THEORETICAL CONTENT			PRACTICAL CONTENT:	
MODULES	TOPICS	MENTOR'S ACTIVITIES	SPECIFIC LEARNING OUTCOMES	RESOURCES
1	1.1 Information and Communication Technology. 1.2 Importance of ICT in Construction. 1.3 Applications of different Software in the building industry	Candidates to be mentored on the use of various software.	Candidates should understand ICT applications to buildings, software and applications useful to the building industry. 1.1 Define ICT in relation to building profession and discuss its application to building industry. 1.2 Discuss benefits of ICT to Building Industry. 1.3 Discuss and demonstrate relevant software and applications useful to building industry (Word Processing, Data Processing, Design, Presentation, Planning, Monitoring and Estimation. 1.4 Programming with Data processing software, Computing Logical operations, Formatting of Excel spreadsheet.	Projector Magnetic Boards Text books. Smart Board Computer/Laptop Applicable Software
2	1. Evolving trends in the building industry. 2. ICT application in the preparation of Builders' documents	Candidates to be mentored on the use of various software.	Candidates should understand ICT applications the new areas ICT is making inroads into the construction industry. 2.1 Evolving trends in ICT applications to building Industry. a. Smart and intelligent buildings. b. BIM c. BMS-Building Management System d. Building Energy Management System- BEMS e. Use of Drones in Construction f. Use of CCTV in constructions. g. Importance of Internet of things h. Artificial Intelligence	Projector Magnetic Boards Text books. Smart Board Computer/Laptop Applicable Software

			<p>i. Big Data in Building Industry. Builder Practice Software for; a. Preparation of Project Health and Safety Plan. b. Preparation of Project Quality Management Plan c. To prepare Buildability and Maintainability Analysis report. d. To prepare Construction Methodology.</p>	
3	<p>1 Principles of Building Information Modeling. 2 Benefits of BIM 3 Software used for BIM implementation. 4 Application of BIM 5 BIM processes and procedures.</p>	<p>Candidates will be mentored through professional practice and adoption of BIM.</p>	<p>Candidates should be taken through BIM processes and Procedures, learning the advantages and benefits of BIM applications to building and construction process, maintenance processes and deconstruction process. They should; Understand the Evolution of BIM Understand different dimensions of BIM Appreciate how BIM enhances the construction process. Know the software relevant to BIM implementation.</p>	<p>CORBON 2019 Builders congress proceedings. Web sources Journal Articles Projector Smart Board Magnetic Boards Text books. Computer/Laptop Software</p>

PROGRAM: GRADUATE
COURSE TITLE: ENTREPRENEURSHIP EDUCATION
COURSE CODE: GE 406
COURSE SPECIFICATION: Theoretical and practical contents

Module	Specific Learning Topics	Mentor's Activity	Specific Learning Outcomes	Learning Resources
GENERAL OBJECTIVE1: UNDERSTAND CONCEPTS AND DEFINITION OF TERMS IN ENTREPRENEURSHIP				
1	Understand the following 1.1 Concept 1.2 Mindset 1.3 Enterprise 1.4 Entrepreneur 1.5 Entrepreneurship 1.6 Entrepreneurial mindset 1.7 Intrapreneurship 1.8 Entrepreneurship education 1.9 Corporate entrepreneurship 1.10 Government entrepreneurship	The teacher is expected to define/explain well the terms in this module with specific examples where necessary, relevant to the construction industry	At the end of this module's candidates are expected to know and understand the various concepts and definitions of these terms as used in entrepreneurship	Text books, course materials, magnetic board, markers
2.0. GENERAL OBJECTIVE 2: BRIEF HISTORY AND GENERAL BACKGROUND TO ENTREPRENEURSHIP				
2	2.1 Brief history of entrepreneurship 2.2 Opportunities of business 2.3 Business opportunities in Nigeria 2.4 Factors that will improve business success 2.5 Problems of start-ups in Nigeria 2.6 Key success factors in setting up SME business in Nigeria 2.7 Business growth strategies 2.8 Advantages and disadvantages of self-employment 2.9 Advantages and disadvantages of wage employment 2.10 Problems facing entrepreneurs and entrepreneurship development in Nigeria	The teacher is expected to cover these topics adequately giving life examples where necessary	At the end of module 2, candidates are expected to know and understand the history of entrepreneurship, things and key factors that will guarantee their business success, problems of start-ups and merits and demerits of self-employment and that of paid wage employment as well as problems of entrepreneurship development	Ditto
3.0. GENERAL OBJECTIVES3: UNDERSTANDING BUSINESS IDEAS GENERATION				
3	3.1 Feasibility and viability analysis 3.2 How to find opportunities 3.3 Methods of product selection	The teacher will discuss how to find opportunities in the environment list and explain methods of product selection;	At the end of this module candidates should be able to identify opportunities for business, know	Ditto

	3.4 Phases involved in new product selection i. Idea generation ii. Evaluation iii. Choices	explain feasibility and viability analysis and phases involved in new product selection giving specific examples relevant to the construction industry.	phases involved in new product selection as well as feasibility and viability analysis	
4.0. GENERAL OBJECTIVES 4: UNDERSTANDING THE PROCESS OF REGISTRATION, CLASSIFICATION AND FORMS/ TYPES OF BUSINESS				
4	4.1 Classification of business e.g. i. Micro /cottage industries ii. Small scale industries iii. Medium scale industries and large scale industries i. Sole proprietorship ii. Partnership iii. Private limited company iv. Public limited company v. Joint ventures vi. Mergers and acquisitions vii. Absorption and amalgamation viii. Cooperative society 4.2. Types of business organizations 4.3 Registration of business with Corporate Affairs Commission	In this module the teacher explains the various processes involved in business registration and discusses the classification of businesses and their types stating their advantages and disadvantages giving specific examples relevant to the construction industry	At the end of this modules, the candidates should know how to register their company's classification of companies and types of company to register	Ditto
5.0. GENERAL OBJECTIVE 5: UNDERSTAND THE ENTREPRENEUR, HIS ROLES AND THE CHARACTERISTICS OF A SUCCESSFUL ENTREPRENEUR				
.5	5.1 The entrepreneur 5.2 Fundamental Orientations and Roles 5.3 Important entrepreneurial traits or characteristics 5.4 The competences required 5.5 Stages of becoming an entrepreneur 5.6 Reasons for being an entrepreneur i. General reasons ii. Practical reasons iii. Abstract and personal reasons	The teacher will explain who the entrepreneur is, state the various types of entrepreneurs with the brief explanations, the reasons for being an entrepreneur, advantages as well as fundamental roles. Explain the various stages of becoming an entrepreneur, important traits/ characteristics of successful entrepreneurs' list key competence required and roles of an entrepreneur in	At the end of module 5 the candidates should know and understand who is an entrepreneur, types, reasons for being an entrepreneur, fundamental roles, the various stages of becoming an entrepreneur, traits of successful entrepreneurs and key competences required of them and their roles in business development in Nigeria.	Ditto

	<p>5.7 Advantages of being an Entrepreneur</p> <p>5.8 Types of entrepreneur</p> <p>i. Self- employed</p> <p>ii. Opportunistic entrepreneur</p> <p>iii. The inventor entrepreneur</p> <p>iv. The patterned multipliers</p> <p>v. Economy of scale exploiters</p> <p>vi. Acquirers</p> <p>5.9 Roles of an entrepreneur in business Development in Nigeria.</p>	<p>business development in Nigeria, using appropriate example in the construction industry.</p>		
6.0 GENERAL OBJECTIVE 6: UNDERSTAND AND KNOW THE SOURCES OF FINANCING BUSINESS AND PERSONAL FINANCIAL PLANNING TO ACHIEVE GOALS				
6	<p>6.1. Understanding Business Financing and Types</p> <p>6.2. Sources of business financing</p> <p>6.3 Factors lending institutions consider when appraising a loan application.</p> <p>6.4 Criteria for evaluating loan sources</p> <p>6.5 Types of loans and credits</p> <p>6.6 The risk of savings in starting and sustaining business</p> <p>6.7 Personal financial planning and management</p>	<p>The teacher will name and discuss the two sources of business financing, list and discuss the factors lending institutions consider in granting loan as well as the criteria, the loan application will evaluate before selecting a particular lending institution. He will also name and discuss types of loans credits as well as the steps in personal financial planning and management</p>	<p>At the end of module 6, the candidates should be able to know and understand the sources of business financing, how to evaluate and appraise loans and loan sources, types of loans and credits and steps to be taken in planning and managing personal finances to achieve a goal.</p>	Ditto
7.0. GENERAL OBJECTIVES 7: KNOWING AND UNDERSTANDING SOURCES OF BUSINESS INFORMATION AND COMMUNICATION				
	<p>7.1 Where to obtain business information and assistance</p> <p>7.2 Sources of free information</p> <p>7.3 Define communication and team work</p> <p>7.4 Laws of Teamwork</p>	<p>In this module, the teacher lists and discusses the various sources of business information and assistance as well as where to obtains free information. Define communication and team work, lists social skills for successfully teamwork and how to get your team members to</p>	<p>At the end of module 7, candidates should be able to know where to obtain business information and assistance as well as free sources, define communication and team work know the social skills for successful teamwork, how to get</p>	

	7.5 Social skills for successfully teamwork 7.6 How to get your team members to work along with you	work along with you as well as discuss the laws of team work.	team members work along and understand the seventeen laws of teamwork	
8.0. GENERAL OBJECTIVE 8: UNDERSTAND THE CAPITAL MARKET AND GOVERNMENT INSTITUTIONS THAT SUPPORT ENTREPRENEURSHIP AND THEIR ROLES				
8	8.1 The capital market-Nigerian Stock Exchange (NSE), Security and Exchange Commission (SEC) 8.2 Government Institutions that support entrepreneurship and their roles	In this module, the teacher explains the capital market, list the stakeholders, government Institutions that support entrepreneurship and explains their roles/ (and) functions.	The candidates should at the end of this module, be able to know and understand the capital market, the stakeholders, list of government institutions that support entrepreneurship and their roles.	Ditto
9.0 GENERAL OBJECTIVE 9: UNDERSTAND AND KNOW HOW TO WRITE A BUSINESS PLAN				
9	9.1 Understanding a Business plan 9.2 State the purpose and goal of a business plan 9.4 Discuss business plan preparation 9.3 State the components of a business plan	In this module, the teacher defines business plan, states the goals of a business plan, what to plan, business plan preparation, components of a business plan and reasons for writing a business plan and shows the candidates a typical business plan	At the end of this module, the candidates should be able to know and understand a business plan, goals of a business plan, what to plan and how to prepare a business plan for a small business.	Ditto

10.0. GENERAL OBJECTIVE 10: UNDERSTAND MARKETING IN A BUSINESS				
10	10.1 Understanding marketing 10.2 Principles of marketing theory 10.3 Marketing management functions 10.4 Market assessment 10.5 The 5Ps of marketing	In module 10, the teacher defines marketing, discusses principles of marketing, marketing assessment, marketing management functions and the 5 Ps of marketing	At the end of this module, the candidates should be able to define marketing, know and understand the principles of marketing, theory of marketing, market assessment marketing management functions and the 5 Ps of marketing	Ditto

PROGRAMME: TECHNOLOGIST

COURSE CODE: GE 301

COURSE TITLE: CONSTRUCTION TECHNOLOGY

Modules	Topic	Mentor's Activities	Learning Outcome	Resources
1	INDUSTRIAL PRACTICE 1.1 Organizing the building process; 1.2 Types of design and practicing firms/organizations; 1.3 Organizational structure and function of production; and 1.4 Firms/organizations	Candidate are to be guided on practical ways of setting up, organizing and managing building and industrial practices	Candidate should demonstrate a clear understanding of the organizational structure of building firms and the production of building components.	Textbooks and journal on Construction Technology
2	PRELIMINARY SITE OPERATION AND ORGANIZATION: 2.1 Site conditions; 2.2 Location of plants and choice of equipment; 2.3 Temporary Service; - Drainage, water and electrical supply for site works; 2.4 Means of Access; 2.5 Temporary installation and layout of offices, stores welfare, security, health and safety; 2.6 Problems related to site and surface cleanings; and 2.7 Methods of excavation and transportation including bulk excavation and rocks.	Candidate should be guided on site operation and organization	Ditto	Ditto
3	CONSTRUCTION TECHNIQUES; 3.1 Choice of construction method; Foundations and substructure; 3.2 Excavation and means of support; 3.3 Design of support systems; 3.4 Foundation types and methods of construction for new work; 3.5 Work associated with alterations and repairs; 3.6 Settlement of structure and its limitations; and 3.7 Single and multi-storey basement and construction and retaining walls	Candidates should be guided on the construction techniques and methods	Ditto	Ditto
4	SUPERSTRUCTURE: 4.1 Load bearing and non-load-bearing bended unit forms of construction; 4.2 Framed buildings and construction in timber, steel and concrete;	Candidates should be guided practical ways on carrying out the superstructures in buildings	Ditto	Ditto

	<p>4.3 Double and framed floors for large spans; 4.4 Principles of large span reinforced concrete floors; 4.5 Economic consideration in floor thickness; 4.6 Use of beams; framing in steel and reinforced concrete; 4.7 Formation of opening; 4.8 Pitched roof construction; 4.9 Flat and pitched roof covering and drainage; 4.10 Concrete production, controls and testing; 4.11 Reinforced concrete and pre-stressed forms of construction; 4.12 Formwork including design and erection; 4.13 Offsite and onsite production line in process; 4.14 Scaffolding and safety of structure during erection; and 4.15 Vertical and horizontal ducts</p>			
5	<p>FINISHINGS: 5.1 Treatment of openings: windows, doors, roof lights, staircase including stair construction and finishes; 5.2 Dry partitioning and walling systems; 5.3 Wall and element claddings and covering; 5.4 Dry and wet wall finishes; 5.5 Construction problems and techniques associated with the components and finishing of buildings; and 5.6 Floor finishes in wood, block, tiles, plastics and flat roof</p>	<p>Candidates should be guided on the practical ways of carrying out finishes in buildings</p>	Ditto	Ditto

PROGRAMME: TECHNOLOGIST EXAMINATIONS				
COURSE TITLE: STRUCTURAL THEORY AND DESIGN 1		COURSE CODE: TE 302		CONTACT HOURS:
GOAL: TO EQUIP CANDIDATES WITH COMPETENCIES IN THE ANALYSIS AND DESIGN OF BUILDING STRUCTURAL ELEMENTS				
COURSE SPECIFICATION: THEORETICAL CONTENT			PRACTICAL CONTENT	
Modules	Topics	Mentor's Activities	Specific Learning Outcomes	Resources
General Objective 1: INTRODUCTION TO STATICALLY INDETERMINATE STRUCTURE				
1.	Internal and external indeterminacy. Methods of determining indeterminacy.	1.1 Explain the external indeterminacy of structure 1.2 Sign convention and support types. 1.3 Explain the internal indeterminacy of structure 1.4 Discuss various methods for determining indeterminacy	Candidates should be able to determine the degree of indeterminacy of a given structure.	TEXT BOOKS on Strength of Materials or Structural Analysis
General Objective 2: BENDING MOMENTS AND SHEARING FORCES.				
2.	Bending Moment and Shearing force calculations, Bending Moment and Shearing force diagrams.	2.1 Introduction and Basic definitions – bending, plane bending, and point load etc. 2.2 Classification of Beams 2.3 Sign conventions used for writing the general expression for Bending moments and Shearing force. 2.4 Derivation of bending moment and shearing force equations for different beams with different loading conditions. 2.5 Bending moment and Shearing force diagrams derived from 2.4 above.	Candidates should know how to derive Bending moment and Shearing force equations for different Beams and for different loading types. The candidates should be able to draw Bending moment and Shearing force diagrams.	TEXT BOOKS on Strength of Materials or Structural Analysis
General Objectives 3: BUILT – IN (OR FIXED) BEAMS.				
3.	Fixed beams carrying different loading conditions.	3.1 Analyse fixed beam carrying point load, at any position, along its span. 3.2 Analyse fixed beam carrying distributed load (uniformly and varying) along its span. 3.3 Analyse fixed beam with ends at different levels (effect of Sinking supports).	Candidates should be able to identify fixed beam from real drawing, and carry out analysis of a given problem.	TEXT BOOKS on Strength of Materials or Structural Analysis

General Objective 4: CONTINUOUS BEAMS				
4.	Analysis of continuous beams using Hardy Cross Method of Moment distribution, Clapeyron's Three moment equation and Moment coefficient.	4.1 Explain Clapeyron's Theorem of Three Moments. 4.2 Explain Hardy Cross Method of Moment Distribution. 4.3 Analyse continuous beam carrying unequal uniformly distributed load over its spans – using three moment equation.. 4.4 Analyse continuous beam with fixed end.. 4.5 Analyse continuous beam with overhangs. 4.6 Analyse continuous beam of unequal spans carrying both point and uniformly distributed load over its spans – using three moment equation.. 4.7 Analyse continuous beam of almost equal spans carrying uniformly distributed load of equal intensity over its spans – using moment coefficient.. 4.8 Deflection determination and shape.	Candidates should be able to identify and applied appropriate method for analyzing continuous beam based on the loading conditions.	TEXT BOOKS on Strength of Materials or Structural Analysis.
General Objective 5: ANALYSIS OF FRAME STRUCTURES.				
5	Types of Frames and fixing conditions – roller, pinned or fixed. Methods of determining Stresses in a Frame Structure.	5.1 Types of Frames 5.2 Determination of reaction (graphically) 5.3 Determination of stress using methods of Joints and Sections for Trusses. 5.4 Determination of stress using graphical method. 5.5 Principles of Influence lines – live loads and Series of concentrated live loads.	The candidates should be able to analyze and differentiate between tensile and compressive members in a given truss system.	TEXT BOOKS on Strength of Materials or Structural Analysis
General Objectives 6: LIMIT STATE APPROACH IN REINFORCED CONCRETE DESIGN				
6	Limit States – Serviceability and Ultimate. Codes and Standards for Reinforced Concrete Design. Introduction to Euro codes. Various partial factors of safety for loads – dead, live and wind.	6.1 Explain the object of Limit State Design. 6.2 Explain the use of relevant Codes and Standards in the design of reinforced concrete structure 6.3 Limit state characteristic material strength and safety and design loads. 6.4 Explain ultimate limit state as a probabilistic approach to design.. 6.5 Explain dead loads, imposed loads and wind loads 6.6 Explain partial factors and global factors of safety. 6.7 Explain Serviceability Limit state. 6.8 Calculate design load for ultimate and Serviceability Limit states.	The candidates should be able to compute the design load to be used in the analysis and understand the basis of Euro codes design compared to BS8110.	TEXT BOOKS on Reinforced Concrete Design to Euro codes

		6.9 Explain Serviceability Limit state in terms of deflection, cracking, durability, fire resistance, vibration and fatigue. 6.10 Introduction to Euro codes and comparison with BS 8110.		
General Objectives 7: STRESS – STRAIN RELATIONSHIP FOR CONCRETE AND STEEL				
7.	Beam Stress- Strain and Design of Sections – both singly reinforced and doubly reinforced.	7.1 Explain Short-term design stress-strain curve for concrete in compression. 7.2 Explain Short-term design stress-strain curve for steel. 7.3 Illustrate bar shape and sizes, grades and strength of concrete and reinforcement.	The candidates should be able to apply the derived formula in reinforced concrete design.	TEXT BOOKS on Reinforced Concrete Design to Eurocodes
General Objectives 8: DESIGN OF REINFORCED CONCRETE RECTANGULAR BEAMS				
8	Tee and Ell beams: preliminary sizing of beams, moments of resistance; compression steel reinforcements. Design of Continuous beams.	8.1 Explain the behavior of reinforced concrete beam section. 8.2 Carry out preliminary analysis and member sizing. 8.3 Calculate the moment of resistance for a singly and doubly reinforced section. 8.4 Calculate the compression steel reinforcement. 8.5 Design a continuous beam. 8.6 Calculate effective width of flange beam for T- and L- sections. 8.7 Calculate moment of resistance for flange beams. 8.8 Design flanged beam.	Candidates should be able to identify Tee and Ell – beams from real drawing and design appropriately, and also been able to design a continuous beam for both singly and doubly reinforced sections..	TEXT BOOKS on Reinforced Concrete Design to Euro codes.
General Objectives 9: DESIGN OF SOLID SLABS AND TYPES OF STAIRS				
9	Preliminary sizing of slab; one – way and two- ways spanning slab; shear, local bond and distribution bars; Types of staircases and design of Dog-leg Stairs.	9.1 Preliminary sizing of slabs using span – effective depth ratio. 9.2 Design slab spanning in one direction. 9.3 Design slabs spanning in two directions. 9.4 Calculate shear, punching shear, local bond and distribution steel. 9.5 Types of Staircases. 9.6 Design of Dog-leg (180°) Stair and landing.	The students should be able to differentiate between one – way and two- ways spanning slab; calculate shear, local bond and distribution bars as well as different staircases used in construction. The design of dog-leg, being the most common should be understood here by the candidate.	TEXT BOOKS on Reinforced Concrete Design to Euro codes
General Objectives 10: DESIGN OF COLUMNS AND SHALLOW FOUNDATIONS				
10	Classification of columns, design of axially loaded short and slender columns,	10.1 Classification of columns. 10.2 Design of short column at ultimate state. 10.3 Design of slender column at ultimate state. 10.4 Types of Foundations. 10.5 Analyse and design of strip foundation.	Candidates should be able to design axially loaded columns, strip and pad foundations.	TEXT BOOKS on Reinforced Concrete Design to Eurocodes

Types of foundations and design of strip and pad foundations.	10.6 Analyse and design of pad foundation.		
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PROGRAMME: TECHNOLOGIST				
COURSE TITLE: BUILDING SERVICES		COURSE CODE:AE 303		CONTACT HOURS:
GOAL: TO EQUIP CANDIDATES WITH ELECTRO-MECHANICAL COMPONENTS AND PERORMANCES OF BUILDINGS				
COURSE SPECIFICATION: THEORETICAL CONTENT			PRACTICAL CONTENT:	
MODULES	TOPICS	MENTOR'S ACTIVITIES	SPECIFIC LEARNING OUTCOMES	RESOURCES
General Objective 1: Have a general knowledge about electrical supplies in buildings, its mechanisms, safety measures in the installations, energy management system and building automation/management system				
1.1- Electrical	<p>Modes of generation, transmission and distribution of electricity to buildings</p> <ul style="list-style-type: none"> - Basic electrical installations in buildings and tariff systems - Controls and protection of installations (fuses, circuit breakers, switches and outlets) - Conductors and cables (cable sizes and types) - Circuits (sizes, rating, voltage drop and earthing) - Electricity supply regulations IEE- Designs and Calculations - Earthing systems and bonding (conduit, surface and Trunking systems) - Construction site electricity - Electrical installations for water heating, lighting and power system - Testing completed installations - Building Automation/Management System - Energy Management Systems - Lightning protection systems 	Candidates will be guided through the activities to be carried out towards electrical energy supply to buildings, the evolving devices to be integrated into buildings and how to conserve energy consumption while increasing building performance through automation system.	Candidates will be able to understand basic issues on energy transmission and distribution systems in buildings, the associated issues on electricity supply to buildings, the distribution, conductors, design of cables, associated accessories, energy consumption practices and testing of installation of electrical services in buildings, building electrical services performances and automation processes.	Textbooks on: Energy related development in the built environment, Electrical designs in buildings, Building management system, Building automation system, Building services, Building science, Environmental studies
General Objective 2: Have a general knowledge on gas supply to buildings, the associated components, mechanisms, installations and safety measures/requirements				
2.1- Gas	<ul style="list-style-type: none"> - Gas: types, occurrence, generation and processing - Distribution and installation of gas supply services pipe work in buildings 	Candidates will be guided through the use of gas in buildings by	Candidates will be able to understand basic issues on the types of gas, processing,	- Textbooks on: Energy related resources, Gas management, processing and supply,

	<ul style="list-style-type: none"> - Uses of gas in buildings and gas appliances - Gas meters and supply/service components - Gas design and supply calculations - Safety precautions during installations of gas pipe work in buildings - Testing for gas supply installations - Ventilation requirements of gas supply in buildings 	different domestic, commercial and industrial appliances, the level of workmanship required and the need to satisfy approved standards in its installations in buildings.	transmission and distribution systems in buildings, the use of gas supply accessories, safety and precautionary mechanisms, testing and installations processes.	Design and installation of gas supply in buildings, Building services, Environmental studies.
General Objective 3: Have a general knowledge on lighting supply in buildings				
3.1- Lighting	<p>Sources of light in buildings</p> <ul style="list-style-type: none"> - Natural and artificial lighting requirements for buildings - Daylighting - Relationship of window design to lighting in buildings - Lamps, luminaries and definition of lighting terms - Principles of artificial lighting including reflection and incidence characteristics - Lighting design and requirements - Lighting wiring, cables and types of lamps - Lighting control systems - Lighting retrofitting system - Lighting and energy conservation in buildings. 	Candidates will be guided through the activities to be carried out in the provision of lighting needs in buildings, how to achieve lighting design and meet lighting requirements for different types of buildings.	Candidates to have knowledge of the sources of lighting in buildings, naturally and artificially, the various types of lamps used in buildings, cable sizes for lighting purposes in buildings, energy consumption patterns of different types of lamps and lighting controls in practice.	<ul style="list-style-type: none"> - Textbooks on: Lighting related matters, Energy development and supply into buildings, Electricity supply in buildings, Lighting management and control system, Building science, Environmental studies.
General Objective 4: Have a general knowledge on mechanical and transporting facilities in buildings				
4.1- Mechanical and transporting systems in buildings	<ul style="list-style-type: none"> - Various forms of mechanical transportation systems used in buildings: lifts, escalators, paternosters, travelators, mail chutes - Planning, performance and operational requirements of mechanical transporting systems in buildings - Uses and applications of mechanical transporting systems in buildings - Lift controls, roping systems, associated components and operational systems - Safety principles in the use of mechanical transporting systems in buildings. 	Candidates will be guided through the design, operations, use, management and safety requirements of the mechanical and transportation facilities used in buildings.	Candidates should be able to have the understanding of the, functions; design and operational requirements of the various types of mechanical and vertical transporting equipment used in buildings. There will be the knowledge of the components and control systems of the transporting facilities used in buildings.	Text books on Mechanical and Transporting Systems in Buildings, Building Services Handbook, Building Services Textbook, Building and Environmental Science Textbook, Textbook on Facilities Management, Textbook on Buildings and Infrastructures.

	- Lift designs and calculations			
General Objective 5: Have a general knowledge on the use of ventilation and air-conditioning systems in buildings				
5.1- Air-Conditioning Process	<ul style="list-style-type: none"> -Candidates will know: -Types of Ventilation - Air-conditioning: principles and applications - Types of air-conditioning systems and processes - Air-conditioning and ventilation systems for simple buildings- refrigeration's, chiller, household refrigerators and freezers - Central plant including refrigerator and cooling towers - Control techniques, control dampers - Components of air-conditioning systems - Operation, maintenance and commissioning of air-conditioning systems - Health and environmental risks of ventilation and air-conditioning systems: sick building syndrome, humidifier fever and legionnaires disease. 	Students will be guided on the applications, use and operational requirements of ventilation and air-conditioning systems in buildings.	Candidates will know the, types, uses, applications and components of different ventilation and air-conditioning systems in buildings.	Textbooks on Buildings, Building Services Handbook, Building Services Textbook, Building and Environmental Science, Ventilation Systems in Buildings.
General Objective 6: Environmental Issues in Buildings				
6.1- Waste Management in Building	<ul style="list-style-type: none"> - Types of waste generated in buildings: solid, liquid and gases - Effects of waste generation - Facilities to manage waste generation in buildings: refuse chute, skip, landfills - Applications of waste hierarchy in managing waste generated in buildings- 3Rs - Health and safety management issues in managing waste generated in buildings - Sustainable practices in building 	Candidates to be mentored on how to ensure environmental performance of buildings through the provision of facilities to manage waste generation, control occurrence of fire and ensure the provision of sustainable buildings.	Candidates should be able to understand the occurrence of waste in buildings, and the facilities needed to manage its generation so as to entrench sustainable buildings. Candidate should also know how fire occurs, fire triangle and the various design, preventive and facilities/measures needed in order to manage fire in buildings.	Textbooks on Buildings, Building Services Handbook, Building Services Textbook, Building and Environmental Science, Waste management, solid, liquid and gases, Textbook on Fire and its management
6.2: Fire Management in Buildings	<ul style="list-style-type: none"> - Fire and Buildings - Types, Causes and Occurrence of Fire in Buildings - Fire Management Strategies: Active and Passive Techniques. 			

PROGRAMME: TECHNOLOGIST**COURSE TITLE: BUILDING LAW AND ARBITRATION****COURSE CODE: TE 304 GOALS: TO INTRODUCE CANDIDATES TO BASIC LEGAL KNOWLEDGE REQUIRED AS CONSTRUCTION PROFESSIONALS COURSE SPECIFICATION: THEORITICAL CONTENT**

MODULE	TOPICS	MENTOR'S ACTIVITIES	SPECIFIC LEARNING OUTCOMES	RESOURCES
1. 1.1 1.2 1.3 1.4 1.5 1.6	NIGERIAN LEGAL SYSTEM Definition of Law Sources of Nigerian Law Constitutional Supremacy The concept of Rule of Law The doctrine of separation of powers Principal legislation and subsidiary legislation	The mentor must be able to take candidates through the structure of the Nigerian Legal system and explain the principle of constitutional supremacy with examples the mentees can relate with.	Candidates are expected to have basic understanding of the Nigerian Legal Structure and hierarchy of courts.	Textbooks on Nigerian Legal System
2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 2.10	LAW OF CONTRACT Nature of contracts and obligations. Rules governing formation of contract – offer, acceptance, consideration and intention to create legal relations; contractual capacity Types of Contracts – express contract, implied, unilateral and bilateral contracts Void contracts and illegal contracts Mistake, misrepresentation Estoppels Performance and discharge Remedies – damages and quantum merit Privities of contract; subcontract Exclusion clauses.	The Mentor is expected to explain to the candidates, principle of contracts, form of contracts and the usual parties to every construction project. Examples would be given of case scenarios of construction contracts, breaches and remedies.	Candidates are expected to understand the principles of law relating to obligations and litigations which may arise during construction operations.	Any Law of Contract Textbook

<p>3.</p> <p>3.1</p> <p>3.2</p> <p>3.3</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p>3.8</p> <p>3.9</p> <p>3.10</p> <p>3.11</p>	<p>PHYSICAL DEVELOPMENT LAW</p> <p>Physical Planning laws and Regulations</p> <p>Statutory Notices and enforcement procedures</p> <p>National Building Code and Builders' roles</p> <p>Development permits</p> <p>Building lines, obstructions, right of the public and adjacent owners</p> <p>Employer's liability insurance</p> <p>Professional indemnity insurance</p> <p>Workmen compensation insurance</p> <p>Damage to third party and property</p> <p>Government Departments and Local Authorities</p> <p>Public Health.</p>	<p>It is expected that the Mentor would expose candidates to the purposes of physical planning laws and regulations as applicable at Federal, States and Local Government levels. The mentor would explain the roles of builders as provided in the National Building Code. All topics are to be taught with relevant examples.</p>	<p>This topic equips candidates with knowledge of relevant laws and regulations relating to physical developments in Nigeria.</p>	<ol style="list-style-type: none"> 1. Textbooks on Planning and Development; 2. National Building Code 3. Different State Physical and Development Laws and Regulations
<p>4.0</p> <p>4.1</p> <p>4.2</p> <p>4.3</p> <p>4.4</p> <p>4.5</p> <p>4.6</p> <p>4.7</p> <p>4.8</p>	<p>ALTERNATIVE DISPUTE RESOLUTION</p> <p>Meaning of Alternative Dispute Resolution (ADR)</p> <p>Principle of arbitration</p> <p>Appointment and duties of Arbitrators</p> <p>Procedure, evidence, points of claims and defense</p> <p>Revocation of arbitration agreements</p> <p>Arbitral awards and enforceability</p> <p>Irregularities: waivers, cost and fees</p> <p>Proof of evidence in building contract disputes.</p>	<p>The meaning of ADR will be explained to the candidates. Advantages of ADR over the regular judicial processes would be identified and explained. The mentor is expected to make the candidates understand with local examples different types of ADR and their relevance to construction profession.</p>	<p>The importance of alternative dispute resolution in construction dispute as against the normal court system is the focus of this topic.</p>	<p>Textbooks on Alternative Dispute Resolution</p>

<p>5.0</p> <p>5.1</p> <p>5.2</p> <p>5.3</p> <p>5.4</p> <p>5.5</p> <p>5.6</p> <p>5.7</p> <p>5.8</p> <p>5.9</p> <p>5.10</p>	<p>LAW OF TORT / CIVIL WRONG</p> <p>Nature of torts</p> <p>Principles of liability</p> <p>Classifications of torts</p> <p>Negligence</p> <p>Nuisance, Ryland v. Fletcher</p> <p>Trespass, breach of statutory duty, liability for spread of fire</p> <p>Disturbance of easements</p> <p>Restrictive covenants</p> <p>Dilapidations</p> <p>Rights and duties of occupiers.</p>	<p>The mentor is expected to explain to the mentees the principle of liability in tort, how they arise and remedies for breaches of legal injuries. Particular references must be made to legal injuries that may arise in construction industry.</p>	<p>Candidates are expected to be equipped with the basic knowledge of compensation for legal injuries</p>	<p>Any textbook on Law of Tort</p>
<p>6.0</p> <p>6.1</p> <p>6.2</p> <p>6.3</p> <p>6.4</p> <p>6.5</p> <p>6.6</p> <p>6.7</p> <p>6.8</p> <p>6.9</p>	<p>LAW OF PROPERTY</p> <p>4.7 Nature of property</p> <p>4.8 Classes of interest and title to land, freehold and leasehold</p> <p>4.9 Ownership and possession</p> <p>4.10 Mortgages, leases</p> <p>4.11 Fixtures and fittings</p> <p>4.12 Easements</p> <p>4.13 Chattels</p> <p>4.14 Compulsory acquisition</p> <p>4.15 Pledge.</p>	<p>This topic is to be introduced to the mentees, drawing practical examples from circumstances that they can easily relate with. The relationship to construction industry is to be identified.</p>	<p>The topic aims at equipping candidates with law relating to property rights and different classes of interests in property.</p>	<p>Any textbook on Property /land law</p>

COURSE TITLE: BUILDING MEASUREMENT AND ESTIMATING & PRICE ANALYSIS.		COURSE CODE: TE 305		
COURSE SPECIFICATION: THEORETICAL CONTENT				
Modules	Topics Covered.	Mentors Activities	Specific learning Outcomes	Resources
1	1.1 Site Preparation and Temporary works. <ul style="list-style-type: none"> - Underpinning, basements, foundations and sub structural works in level and sloppy site. - External and internal walls. - Partitions. - Floors in timbers and concrete. - Stairs and ramps in timbers and concrete. - Super structural works, - Lintels. 	Candidates to be mentored on the use of estimating software for preparation of builders estimate.	<ul style="list-style-type: none"> -Calculate girth of external wall and internal wall. - determine depth of excavation. conc. In trench. Block wall in foundation, vol. of excavation, backfilling and level and compacting foundation trench. Vol. of earth and hardcore filling, formwork to the site of concrete. Floor concrete. - Wall in superstructure. -Lintel in walls. Formwork to beam and column. Formwork to soffit of suspended slab. etc. Formwork to stairs. Reinforcement in lintel, columns and slabs. 	Building measurement text book
2	2.1 Roof in timber, concrete and metal <ul style="list-style-type: none"> - Roof lining, roof lighting - Framed and unframed structural steel and casings. - Insitu and precast frames and components. - timber construction and cladding - Windows and doors in timber, metal and their openings. - joinery and fittings - Internal and external decorations. - External works and below ground drainages. Services installations, sanitary fittings, hot and cold water, gas, water, heating. - Above ground drainages and rain water disposal, domestic electrical services. 	Candidates to be mentored on the use of estimating software for preparation of builders estimate.	Determining roof slope. Identify roof carcass such as tie beam, struts, king and queen posts, rafters and purloins with their spacing. In timber roof structure. Using the slope to determine respective length and quantities of each roof carcass members. Calculating concrete roof quantities as in suspended slab. Calculating steel structures members' quantities such as steel beam, steel struts and purloins, steel rafter, use of gusset and web plates and their respective spacing.	Building measurement text book
3	3.1 Define contract law 3.2 Identify offers from acceptance 3.3 Differentiates between invitation to treat and offer and its applicability to the building industry. 3.4 Discuss 5 essentialities of a valid contract. 3.5 Treat case studies with the 5 essentialities of a valid contract. 3.6 Discuss JCT contract provisions.	Candidates will be guided through applications of the 5 essentialities of a valid contract to different contracts scenarios.	<ul style="list-style-type: none"> . Candidates should Know the difference between formal and informal contract. Candidates to apply the 5 essentialities of valid contract to contract scenarios to determine contract validity. Jct provisions wrt -contract formation - determination -stop work order - variations etc. 	Various NIOB AGM reports. Bulletins and NIOB publications. Text books on principles of contract law. Text books on PPP NIOB Journal

4	<p>4.1 Building up of unit rates</p> <ul style="list-style-type: none"> - labour rates -Materials - Plants and equipment -Profit and Overheads <p>4.2 Evolution of Due Diligence Process.</p> <ul style="list-style-type: none"> - Variants of contract types. - BOT, Build operate and transfer - Developers Scheme <p>4.3 tender Analysis and report.</p>	Candidates be mentored on the use of builders estimate software using relevant software.	<p>Candidates should be able to calculate unit rates of specified components.</p> <p>Differentiates between direct overhead and indirect overhead.</p> <p>Factors which influences whether to buy or lease plants.</p> <p>Factors which determines profit level of a construction company.</p> <p>Reasons why we do estimating and Price Analysis.</p>	<p>Text book on tendering procedures</p> <p>NIOB compendium</p>
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PROGRAMME: TECHNOLOGIST

COURSE TITLE: CONSTRUCTION ECONOMICS AND MANAGEMENT CORSE CODE: AE 306 CONTACT HOURS:

GOAL: TO EQUIP CANDIDATES WITH THE ECONOMIC AND MANAGERIAL KNOWLEDGE REQUIRED FOR SURVIVAL IN THE CONSTRUCTION INDUSTRY

Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1	<p>1.1 Definition & Scope of Economics; Few Fundamental Concepts;</p> <p>1.2 Demand; Supply; Equilibrium;</p> <p>1.3 Theory of Production;</p> <p>1.4 Theory of Cost.</p>	Candidates should be able to know the concept of Economics, Demand, Supply and Equilibrium Understand the theory of production and Cost.	<p>Candidate should be able to understand the concept and fundamentals of Economics.</p> <p>Understand the concept of Demand and Supply, Equilibrium.</p> <p>Understand the theory of production and the theory of Cost.</p>	Published text books on Economics and Management; Published Journals and Other periodicals; Internet etc.
2	<p>2.1 Introduction to the Evolution of management thought;</p> <p>2.2 Principles of Scientific Management; Principles and Techniques of Management; Bureaucratic Management.</p> <p>2.3 Organisation Theory</p>	Candidates should have a general knowledge of the evolution of Management Thought	Candidates will be able to understand the idea leading to the development of the principle of management, for the economic control of scarce resources.	Published text books on Economics and Management; Published Journals and Other periodicals; Internet etc.
3	<p>3.1 Management - Introduction; Planning;</p> <p>Forecasting; Decision-Making; Organizing; Staffing; Directing; Supervision; Communication; Controlling; Co-ordination</p>	Candidate should have a general understanding of the Management Process	Candidates will be able to understand the rudiments of management functions, and their application in the economic control of scarce resources.	Published text books on Economics and Management; Published Journals and Other periodicals; Internet etc.
4	Leadership and Motivation	Candidates should have the general knowledge of the	Candidates will be able to understand the nature, importance, and application	Published text books on Economics and Management;

		elements of leadership and motivation.	leadership and motivation in management of manpower.	Published Journals and Other periodicals;Internet etc.
5	Introduction; Classification of Groups; Group Formation; Principles of the Group Dynamics	Candidates should have the general understanding of group and teamwork	Candidates will be able to understand the nature and importance of team work in the collaborative process of achieving project goals. Candidates will be able to understand the nature and importance of team work in the collaborative process of achieving project goals.	Published text books on Economics and Management; Published Journals and Other periodicals; Internet etc.
6	Construction Industry, Structure; Actors; Function and Importance; Problems;	Candidates should have the general understanding of nature and importance the Construction Industry	Candidates will be able to understand the nature, importance of the construction industry as different from other industries of the economy.	Economics and Management; Published Journals and Other periodicals; Internet etc.
7	Relationship Among Construction Stakeholders; Types of relationships; Indicators of team integration; Variables influencing team efforts	Candidates should have the general knowledge of the nature of relationship among construction stakeholders	Candidates will be able to understand the nature and types of construction resources. They will know the common practices involved in their Utilization.	Published text books on Economics and Management; Published Journals and Other periodicals; Internet etc.
8	Overview of Construction Resources. Features of a resource; Common construction resources; Construction Manpower; Labour Management Practices; Construction Materials; Construction Equipment; Construction Money; Construction Time; Construction space/land; Construction Information.	Candidates should understand the various resources used in construction	Candidates will be able to understand the nature and types of construction resources. They will know the common practices involved in their Utilization.	Published text books on Economics and Management; Published Journals and Other periodicals; Internet etc.
9	Housing Policies. Affordable Housing In Developing Countries; Current National Housing Policy in Nigeria; Challenges of low income housing Affordable Housing In Developing Countries; Current National Housing Policy in Nigeria; Challenges of low income housing	Candidates should have the general understanding low income Housing Policies and principles	Candidates will be able to appreciate the elements of affordable housing, and the challenges inhibiting the success of the housing policies in most developing countries.	Published text books on Economics and Management; Published Journals and Other periodicals; Internet etc.
10	Factors affecting location; Localization of an Industry; Advantages and disadvantages.	Candidates should have the general understanding of	Candidates will be able to appreciate what is expected of construction stakeholders in the effort to locate or	Published text books on Economics and Management;

		Location and Localization of an Industry	cite firms in encouragement of entrepreneurial development, they will also know the pitfall of overcrowding of firms in a given area	Published Journals and Other periodicals; Internet etc
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PROGRAMME: LICENTIATE (LE)				
LE 201 BUILDING CONSTRUCTION II				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	I. Control and coordination of site operation ii. Worker safety and welfare	Candidates should know the principals involved in Control and coordination of operation on site including the work of sub-contractors and specialist. Safety and welfare of workers on site.	Candidate should show clear understanding of activities involved in site operations and administration.	Relevant textbooks and publications on site management and Health and Safety on construction site
2.	i. Fire ii. Site preparation and drainage iii. Underpinning, kneading and shoring	Fire, site preparation and drainage, under –pinning, kneading and shoring.	Candidates should have clear understanding of fire and its prevention, site preparation, drainage and underpinning and their application	Books on Fire and safety, Site management and Construction Technology
3.	i. Foundation ii. Walls iii. Floors iv. Roofing	Operational techniques in the construction of foundations, walls, floors, roofing work in steel, timber and reinforced concrete.	Candidates should have adequate knowledge of substructure, superstructure and roofing system used in the construction of buildings	Textbooks on Construction Technology, building construction and Building materials
4.	i. Space frames and roof decks ii. Roof lighting and ventilation iii. Timber and reinforced concrete shell construction	Candidates should possess the necessary skill to construct Space frames and roof decks, roof lighting and ventilation. Timber and	Candidates should understand the different methods, materials and technology of constructing space frames and decks,	Textbooks on Construction Technology, building construction and Building materials

		reinforced concrete shell construction.	lighting and ventilation in roof and shell construction.	
5.	i. Stairs ii. Lifts iii. Ducts iv. Doors and Windows v. Fire proof construction	Candidates should be conversant with stairs in concrete and timber, lift shaft, transmission ducts, doors and windows. Elimination of fire hazard by construction design.	At the end of the lesson, Candidates should understand the Technology, methods, calculations and materials necessary for the construction of stairs, lifts, ducts, doors and window and fire proofing	Textbooks on Construction Technology, building construction, Building materials and fire proofing
1.	i. Introduction ii. Stress, Strain and shear iii. Relevant laws and structural theories iv. Factor of safety v. Tension and Compression Test in steel and concrete vi. Poisson's ratio	Candidates should be taken through the following: 1) Introduction of the science of strength of materials, S.I units 2) Simple stress system: direct shear and stain; Hooke's law, Modulus of elasticity, strain energy, factor of safety, mechanical testing of materials; Tension and Compression test (steel and concrete only), shear stress, shear strain, modulus of rigidity, lateral stain in Tension and compression. Poisson's ratio, shear strain energy.	To show basic understanding of building element and structural theories.	Relevant Textbooks on Theory of structure and Structural design
2	i. Theory of pure bending ii. Moment of inertial iii. Sectional module iv. Bending and direct stress v. Middle third and Middle quarter rule vi. Unsymmetrical bending	1) Pure Bending: theory of pure bending, 1st and 2nd moments of inertia of plane figure. Sectional module for common section, bending stress, combined bending and direct stress. Middle third rule (core of rectangular section). Middle quarter rule, concept of principal axes principle moments of inertia, unsymmetrical bending. Strain energy in bending.	Ditto	Ditto
3	i. shear stress in beam ii. Deflection of Beam iii. Methods of finding deflection in beams iv. Struts	1) Distribution of vertical shear in beam of rectangular and I-section 2) Strain energy principles and general theory of displacement computation; theorem of Beth and Maxwell, Mohr's and Veneschages (graphs multiplication) methods. Area moment methods. Slender struts, effective lengths, slenderness ratio, application of standard	Ditto	Ditto

PROGRAMME: LICENTIATE (LE)				
LE 202 STRENGTH OF MATERIALS II				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources

PROGRAMME: LICENTIATE (LE)				
LE 203 BUILDING SCIENCE & MATERIALS II				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. The physical environment ii. Health and building comfort iii. Effect of climatic conditions on building and its occupants iv. Thermal properties of building materials vi. Heat transfer in building	The physical environment and factors contributing to health and building comfort - Climatic condition with due regard to the degree and frequency of variations relating to heating, ventilation, humidity and condensation - Heat and thermal effects - Solar radiation - Vapour transfer - Thermal properties of materials and the effects on moisture content - Insulating materials - Heat loss through windows, heat absorbent glasses.	Candidates are expected to show a clear understanding of the impact of environmental factors in buildings.	Related textbooks, regulations and standards
2	Sound	- Nature of sound and propagation in solids, liquids and gases. - Review of units of intensity and loudness - Sound transmission through building elements - Control of sound transmission - The principle of sound and insulation and acoustics	Ditto	Ditto
3	Fire Resistance	- Principles of fire prevention, fire loading, flame spread, fire grading. Principles of heat insulation. Heat losses through building materials.	Ditto	Ditto
4	Lighting	General principles of building by natural and artificial methods. Measurement of illumination.	Ditto	Ditto

5	Electrical	- Effects of an electrical current - Alternating and direct current - Principles of generators, motors and transformers.	Ditto	Ditto
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PROGRAMME: LICENTIATE (LE)				
LE 204 LAND SURVEYING II				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. Principles of surveying. ii. Surveying Instruments	Outcome of surveys (maps, site plans, contour maps). Plane table, chain surveying instruments and procedure. Errors in change and correction. Overcoming obstacles.	Candidates should exhibit a clear appreciation of the principles of surveying and surveying instruments in building works.	Textbooks on surveying
2	Traversing with chain and compass.	Traversing with chain and compass, recording of readings and calculations	Ditto	Ditto
3	Measurement of angles	Measurement of angles using transit theodolite and total station.	Ditto	Ditto
4	i.Theodolites ii. Calculations	Adjustment of theodolites. Use of theodolite for setting out. Calculation of areas and volumes related to site surveying	Ditto	Ditto

PROGRAMME: LICENTIATE (LE)				
LE 205 PRODUCTION ECONOMICS II				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. Economic principles ii. Economic institutions	Nature and methodology of economic principle and its relationship with other professionals. - Economic problems and economics mechanisms - Economic systems and framework of business organizations - Resources and capital, population and technological development - Functions of economic institutions	To demonstrate a clear understanding of basic economic principles, concepts and the tools for economic analysis. Exhibit knowledge of the structure and functions of economic institutions.	Related economics Textbooks, journals and financial publications
2	Demand and Supply	Forces and demand supply operating in the market economy to determine prices - Calculate the effect of subsidy from the statistical data provided for examination	Ditto	Ditto
3	Production	The production equilibrium of firm in the economy - Describe the criterial underlying the nation of perfect competition and monopoly - Calculate the production equilibrium of firm from statistical data provided - calculated the breakeven point of firm from statistical data provided	Ditto	Ditto
4	Economic growth	Appreciate the stages of economic growth with reference to the Nigerian - Describe the measurement and uses of national income - Explain main reason for differences in per capital national income - Describe elementary theory of national income determination.	Ditto	Ditto

PROGRAMME: LICENTIATE (LE)				
LE 206 ESTIMATING II				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. Unit rates ii. Cost implication of mechanical Transportation	<ul style="list-style-type: none"> - Analysis of unit rates for excavation oversite, trenches and pits by hand labour and small capacity tractor. Disposal of spoil. - Plain concrete in foundation and bases - Unit rates for brick- work in walls, take-work and different bricks - Cost implications of mechanical transportation 	Candidates should show the ability to explain the bars for costing and estimating of building elements.	Related Economics Textbooks
2	Unit rates analysis for building elements	Various mixes of concrete for: <ul style="list-style-type: none"> - pouring concrete - Simple reinforcement - Timber in joints - Reinforcement concrete in roofs, beam column - Wall finishes - Standard joinery frames, doors, windows etc 	Ditto	Ditto

PROGRAMME: LICENTIATE (LE)				
LE 207 BUILDING MATHEMATICS II				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	Basic concepts of differential calculus and in application	<ul style="list-style-type: none"> - Define limits with examples - States and proves basic theorem on limits - Define differential as an incremental notation or a function - Different function from first principles - Prove the formulae for derivatives of functions, function of a function, products and quotient of functions - Differentiates simple algebraic, trigonometric, logarithmic, exponential, hyperbolic parametric, inverse and implicit functions. - Derive second derivatives of a function - Apply differential to simple engineering and technological problems - Explain the condition for turning point of a function - Determine the tangent to a curve - Determine the normal to a curve 	Candidates are expected to understand basic mathematical concepts in relation to building practices	Textbooks and Journals on Engineering Mathematics
2	i. Engineering Problems ii. Integration and Differentiation iii. Curves and Arcs	<ul style="list-style-type: none"> - Define integration as the reverse of differentiation - Explain integration as a limit of summation of a function - Distinguish between definite and indefinite integrals - Determine the indefinite integral of a function - Determine the definite integral of a function - Integrate algebraic, logarithm, trigonometric and exponential simple functions - List possible methods of integration - Integrate algebraic and trigonometric function by the substitution method - Calculate length of arc, area under a curve, area between two curves, volume of revolution, centre of gravity, centre of surface area, second moment and moment of inertia 	Ditto	Ditto
3	First order homogenous linear equation	First order homogenous linear ordinary equation with constant coefficients as applied to simple engineering problems <ul style="list-style-type: none"> - Define first order differential equation 	Ditto	Ditto

		<ul style="list-style-type: none"> - List order, degree, general solution, boundary or initial conditions and particular solution of differential equation - List examples of various types of first order differential equations - Define first order homogenous differential equations - List the method of solving differential equation by separating variables - Explain exact differential equations - 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. - Define integrating factors - Determine the solution of differential equations using integrating factors - Define linear differential equation of the first order 		
4	Basic concepts of Partial Differentiation	<ul style="list-style-type: none"> - Define partial differentiation - List and explain the uses of partial derivatives - Solve problems on partial differentiation, e.g. $f(x, y) = x^2+y^2= 2xy$, find $dy/dx, dx/dy$ Apply partial differentiation to engineering problems 	Ditto	Ditto
5	Matrices and Determinants	<ul style="list-style-type: none"> - Define Matrix - Define the special matrices B zero matrix, identify matrix B square matrix, skew symmetric - State examples for each of the matrices mentioned above - State the laws of adding and multiplication of matrices - Illustrate the commutative, associative and distributive nature of the laws states above - Explain the transpose of a matrix - Determine a determinant for 2by 2 and 3by 2 matrices - Define the minors and cofactors of a determinant - Explain the method of evaluating determinants - States and prove the theorem A two rows or two columns of a matrix identical, then the value of its determinant is zero 	Ditto	Ditto

	<ul style="list-style-type: none"> - states and prove the theorem A if two rows or two columns are interchange, the sign of the value of its determinants is changed - State and prove the theorem A if any one row or any one column of a matrix is multiplied by the constant, the determinant itself is multiplied by the constant -State and prove the theorem A if a constant times the element of a row or column are added to the corresponding element of any other row or column, the value of the determinant itself is multiplied by the constant. - State examples of each of the theorems mentioned above - Define the adjoint of a matrix - Apply Cramer’s rule in solving simultaneous linear equation - Apply linear transformation in solving simultaneous linear equations 		
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PROGRAMME: LICENTIATE				
LE 208 BUILDING SERVICES II				
Module	Topics	Mentor’s Activities	Specific Learning Outcomes	Learning Resources
1.	Soil and Waste Installation	- Sanitary appliances in building domestics, institutional and commercial buildings	Candidates are expected to show good knowledge of mechanical installations, applications and waste disposal concepts.	Any TEXTBOOK on Building Services
2	Drainage	Underground and surface water drainage system of building and small estates - The use of pumps in drainage - Principles of sewage treatment - Construction of sewage treatment system for small groups of buildings	Ditto	Ditto

		- Separate and combined system of drainage		
3	Disposal	Disposal of domestic and commercial refuse and sewage disposal. Inspection chamber, manholes, soak away, septic tanks, cesspools - Principles of drainage - Principles of soil and waste disposal systems	Ditto	Ditto

GRADE: TECHNICIAN				
TEC 101 BUILDING CONSTRUCTION I				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. Site preparation ii. site lay out iii. Temporary structures iv. Temporary services	Site inspection, site clearing, layout of temporary service – access roads, stores, accommodation	Candidate should show clear understanding of activities involved in site operations and administration.	Textbooks on site operation and management, geological tests and Building Construction
2	Soil Test	Determine the soil type, perform geo technical test e.g. Bearing capacity of soil.	Ditto	Ditto
3	Setting out	Setting out using of building using i. 3,4,5 method ii. Builders square iii. Theodolite	Ditto	Ditto

4	Excavation and Earthwork support	Excavation and earthwork support to simple trenches in various types of soil.	Ditto	Ditto
5	i. Foundation ii. Ground beam iii. Damp proof courses	i. Strip foundation. ii. Reinforce concrete ground foundation. iii. Reinforced concrete ground beams. iv. Damp proof courses.	Ditto	Ditto
6	Building on sloping sites.	I. Factors to be considered II. Slope protection and prevention of earth movement III. Methods for construction on sloping site	Ditto	Ditto

GRADE: TECHNICIAN

TE 102 STRUCTURAL MECHANICS I

Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	Introduction to Structural Mechanics	Structural forms: impulse, work, energy and power. Newton's law of motion, conservation of linear momentum and energy, angular velocity and acceleration.	To show basic understanding of building element and structural mechanics.	Related textbooks on structural mechanics
2	Statics Forces	co-planer forces, equilibrium of concurrent forces: Resolution of co-planer forces: Equilibrium of parallel forces: Moments, centroid.	Ditto	Ditto
3	Bending Moments and Shear Forces	Bending moments and shear forces on a simple structure. Simple beams and cantilever. Relationship between moment and shear force and bending moment. Statically determinate and beams. Structural stability.	Ditto	Ditto

4	Framed Structures	Geometric stability and determinacy of trusses. Forces in trusses. Graphical and analytical methods of determination of forces in trusses.	Ditto	Ditto
5	Hydrostatics	Hydrostatics pressure: resultants on curves surfaces. Centre of pressure. Introduction to Bernoulli principle, flow of water in pipes and channels, the venturimeter	Ditto	Ditto

GRADE: TECHNICIAN				
TE 103 BUILDING SCIENCE & MATERIALS I				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. Concrete ii. Timber iii. Bitumen	<ul style="list-style-type: none"> - Factors affecting the strength and workability of concrete - Mix design methods - Plasters, mortars and rendering - Properties of timber - Seasoning and preservation of timber - Dry rot, wet rot- defects in timber and treatment - Tar and asphalt types - Properties and uses/ applications of bitumen 	Candidates are expected to show a clear understanding of the properties of materials and their application in building construction.	Textbooks on construction materials
2	i. Properties of Matter ii. Metal iii. Thermoplastic iv. Ceramics	Physical and chemical properties of building materials <u>MATERIALS</u> <u>METALS</u> <ul style="list-style-type: none"> - Structural - Effects of alloying - Elastic properties 	Ditto	Ditto

		<ul style="list-style-type: none"> - Fracture, creep and fatigue - Simple corrosion theory <p><u>THERMOPLSTICS</u></p> <ul style="list-style-type: none"> - Structural and mechanical properties - Thermosetting polymers, structure, properties, colloids - Timber and timber products, - Paints, asphalts and ceramics <p><u>CERAMICS</u></p> <ul style="list-style-type: none"> - simple sheet structures - Clay and clay products -Moisture and thermal movement of fired clay products, strength and porosity - Weathering and decay of porous materials - Types of frost action and salt crystallization - Types of glass used in buildings 		
3	i. Cement	<p><u>CEMENTATIONS IN MATERIALS</u></p> <ul style="list-style-type: none"> - Portland and allied cements - setting action and chemical reactions - Physical nature of set materials, moisture movements, volume changes on setting and hardening - Effects of curing, heat evolution, effects of additives - Properties and uses of cement, lime and plaster - Testing of concrete mixes - Factors affecting strength and durability of concrete Structural of solids, liquids and gases -Durability of materials in various environments 	Ditto	Ditto

GRADE: TECHNICIAN				
TE 104 LAND SURVEYING I				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	Principle of leveling	Principles of leveling by optical Methods.	Candidates are expected to show basic understanding of the application and principles of simple surveying instruments.	Text books on Surveying
2	Leveling instrument and methods	Description and uses of Abney level, Cowley level, Dumpy level and Quick set level. Collimation and rise and fall method of Leveling profile and Reciprocal Leveling.	Ditto	Ditto

GRADE: TECHNICIAN				
TE 105 PRODUCTION ECONOMICS I				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. Definition and Scope of Economics ii. Basic Tools for Economic Analysis iii. Demand and Supply	<ul style="list-style-type: none"> - Explain economics and the nature of economics - Define scarcity, want, choice and scale of preference - Examine opportunity cost concept - Explain types of statistics- concepts tables, charts and graphs - Calculation of measures of central tendency, mean, median and mode - Calculate of simple linear equation Definitions, laws, schedule types, demand/supply curves and factors that affect demand and supply.	To demonstrate a clear understanding of basic economic principles, concepts and the tools for economic analysis. Exhibit knowledge of the structure, functions and types of business organizations	Textbooks on Economics, marketing and finance
2	i. Price System and Resource Alteration ii. Production iii. Cost iv. Revenue	<ul style="list-style-type: none"> - Definition of price systems - Functions of price system - Merits and demerits - Meaning, purpose and types of production - Factors of production - Functions of primary, secondary and tertiary production - Division of labour - Merits and demerits, limitation Meaning of cost, types of cost Application of the various types of cost Explanation of the terms: Total revenue, average revenue, Marginal revenue and the relationship between the three concepts	Ditto	Ditto
3	i. Market ii. Competition iii. Labour market	<p><u>MARKET</u></p> <ul style="list-style-type: none"> - Definition - Types of markets, perfect, imperfect, monopoly etc <p><u>PREFECT AND IMPERFECT COMPETITION</u></p> Meaning, features, characteristics, types, merits and demerits	Ditto	Ditto

	iv.	Business organization	<p><u>LABOUR MARKET</u> Definition, labour force, employment and unemployment</p> <p><u>BUSINESS ORGANIZATION</u> - Meaning of business Organization -Types of business organization, Aim/purpose, sources of finance, sole proprietorship, characteristics, merits and demerits - partnership types, characteristics methods of establishment, its merits - Limited liability company- types, characteristics and methods of establishment - Stocks and shares Definition, types, advantages and disadvantages</p>		
4	i.	Public corporation	<p><u>PUBLIC CORPORATION</u> Definition, purpose, nature, reasons for existence, advantages and disadvantages</p>	Ditto	Ditto
	ii.	Inflation and deflation	<p><u>INFLATION AND DEFLATION</u> Definition, types, causes, control and effects of inflation</p>		
	iii.	Public finance	<p><u>PUBLIC FINANCE</u> - The meaning of public finance and fiscal policy - Objectives of public finance - Sources of government finance - Structure of government expenditure - Taxation, types of taxes</p>		

GRADE: TECHNICIAN				
TE 106 ESTIMATING I				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. Budget	Meaning, reason, types and effects of each type of Budget 1.1 Define the terms: All in labour rate 1.2 State the information obtained from the following source. a. Technical reports including site visits b. Bill of quantities c. Standard form of building contract conditions d. Architect's drawing, schedules & specifications e. Codes of practice relating to estimating f. Labour and plant	To show good understanding of basic principles and concepts of estimation of building works	Related texts on Estimating, Budgeting , Tendering ,price analysis, Bill of Quantities and Contract management
2	i. Estimating ii. Unit rates	<p><u>BASIC PRINCIPLES & SCOPE OF ESTIMATING</u></p> Explain techniques of approximation estimating by the use of the following methods: a. Storey enclosure b. Unit c. Superficial d. Rough qualities e. Cube	Ditto	Ditto
		<p><u>CONSTITUTION PARTS OF UNIT- RATES</u></p> Explain the elements of prime cost under: a. Material elements- delivery, unloading, storing, handling and waste. b. Plant elements (applied to unit rate): hiring with associated charges and running cost, 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 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		

3	<p>i. Prime cost , Over head cost and profit</p> <p>ii. Bill of quantities</p>	<p><u>DISTINGUISH BETWEEN PRIME COST, OVERHEAD COST AND PROFITS</u> Define: a. Prime cost b. Project overheads c. General Overheads d. Special risks & consideration</p> <p><u>USE RATE ANALYSIS TO PRICE ITEMS IN BILL OF QUANTITIES</u> Build up unit rate for: a. Surface excavation, trenches and isolated holes, earth work 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 brick and block work roofing and roofing materials</p>	Ditto	Ditto
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GRADE: TECHNICIAN				
TE 107 MATHEMATICS FOR BUILDING I				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	i. Unit of measurement ii. Standard forms iii. Ratio and proportion iv. Variation	<p><u>SYSTEM INTERMEDIATE UNIT</u> Difference between S.I and imperial units of linear measurement: Conversions of S.I units and vice – versa</p> <p><u>STANDARD FORMS</u> Decimal places and significant figures, rounding up figures and expressing numbers in standard forms</p> <p><u>RATIO AND PROPORTIONS</u> Relationship between ratio and proportion. Direct and inverse ratios and proportions</p> <p><u>VARIATION</u> Direct, inverse and partial variations Joint variations</p>	Candidates are expected to understand basic mathematical in relation to building process concepts	Textbooks on General mathematics, Business mathematics and Engineering mathematics.
2	i. Percentage, profit and loss ii. Simple interest iii. Indices iv. Arithmetic and geometric progression v. Surd vi. Algebra vii. Linear equation	<p><u>PERCENTAGES, PROFIT AND LOSS</u> Percentages, profit and loss calculation, commercial arithmetic including profit and loss. Small decimal fraction. Application of profit and loss to commerce generally <u>SIMPLE INTEREST</u> Simple interest calculations</p> <p><u>INDICES</u> Apply the laws of indices in simplification and calculation</p> <p><u>ARITHMETIC AND GEOMETRIC PROGRESSION</u> Sequences and series. Difference between AP and GP. Nth terms of AP and GP. Sum of AP and GP.</p> <p><u>SURDS</u> Simplification of Retimalization of simple surds</p> <p><u>ALGEBRAIC PROCESESS</u> Solve basic arithmetic operation with algebraic symbols</p> <p><u>SIMPLE EQUATIONS</u> Solve problems involving simple equations</p> <p><u>ALGEBRAIC PROCESESS</u></p>	Ditto	Ditto

		<p>Linear, simultaneous equation, solve linear simultaneous equations in two variables</p> <p><u>ALGEBRAIC EXPRESIONS</u></p> <ul style="list-style-type: none"> - Solve simple equations involving fractions - Simple quadratic equations <p><u>GRAPHS OF ALGEBRAIC EXPRESIONS</u></p> <p>Solve simultaneous linear and quadratic equations graphically</p> <p>Solve quadratic equations using appropriate methods</p> <p>Construct quadratic equation with given roots</p> <p>Solve word problems</p>		
3	<p>i. Plane figures</p> <p>ii. Areas of regular and irregular shapes</p> <p>iii. Geometry</p> <p>iv. Triangle</p> <p>v. Circle</p>	<p><u>PLANE FIGURES</u></p> <p>Identify plane figure by their properties</p> <p>Perimeter and areas of plane and geometric plane figures</p> <p><u>AREAS OF REGULAR AND IRREGULAR SHAPES</u></p> <p>Calculate of areas of regular and irregular shapes</p> <p><u>LINES AND SHAPES</u></p> <p>Identify the different types of lines and angles</p> <p><u>CONSTRUCTION</u></p> <p>Simple geometric construction</p> <p><u>SIMILAR TRIANGLES</u></p> <p>Apply the properties of similar triangles to solve exercise in plane geometric figures and solids</p> <p><u>CONGRUENT TRIANGLES</u></p> <p>Apply the conditions of congruency to solve exercises in triangles</p> <p>CIRCLES- ARC,RADIUS, DIAMETER, SECTOR AND SEGMENT</p> <p>Calculate lengths and areas related to the circle</p> <p>AREAS AND VOLUMES OF SOLIDS</p> <p>Calculate the surface areas and volumes of solid figures</p>	Ditto	Ditto
4	<p>i. Statistics</p> <p>ii. Probability</p> <p>iii. Trigonometry</p>	<p><u>INTRODUCTORY STATISTICS</u></p> <ul style="list-style-type: none"> - Practical presentation of data using histogram, bar chart, line- graphical pie-chart - Interpretation of lines and graphs - Frequency distribution of equal and unequal forms - identification of modes, mean and median of graphical data <p><u>PROBABILITY</u></p>	Ditto	Ditto

		<ul style="list-style-type: none"> - define probability terms - solve problems on theoretical and experimental probabilities <p><u>TRIGONOMETRY</u></p> <p>Apply sine and cosine rules to solve problems</p>		
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GRADE: TECHNICIAN				
TE 108 BUILDING SERVICES I				
Module	Topics	Mentor's Activities	Specific Learning Outcomes	Learning Resources
1.	<ul style="list-style-type: none"> i. Cold Water supply ii. Hot water supply 	<p><u>WATER SUPPLY</u></p> <ul style="list-style-type: none"> - water sources, reservoirs and water distribution - Water distribution to buildings - Water treatment - Cold water supply and storage - Direct and indirect and water supply - Merits and demerits of each system of water supply <p><u>HOT WATER SUPPLY</u></p> <ul style="list-style-type: none"> - Supply for domestic, public and commercial buildings 	Candidates are expected to understand the principles of water supply , Heating , ventilation and air conditioning in building.	Textbooks on building services, plumbing, ventilation and air conditioning.
2	<ul style="list-style-type: none"> i. Heating ii. Ventilation iii. Air conditioning 	<p><u>HEATING</u></p> <ul style="list-style-type: none"> - Types and choices of systems including warm air and electrical embodied systems - Methods of heating by steam high or low pressure - Boiler houses and chimney requirements - Modern space heating appliances <p>ventilation</p>	Ditto	Ditto

		<ul style="list-style-type: none">- Nature and mechanical ventilating systems and equipment- stack effects of flue and ventilation operating- Air cleaning services- Air conditioning and control systems for heating and ventilation Refrigeration		
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