

Please, forward your comment on any section of this document to the following email:
nucassessment@gmail.com
You can also call the following phone numbers: 08033145087, 08033201097
All comments should be received before 31st October, 2015

NATIONAL UNIVERSITIES COMMISSION

BENCHMARK MINIMUM ACADEMIC STANDARDS

For

UNDERGRADUATE PROGRAMMES

In

NIGERIAN UNIVERSITIES

ENVIRONMENTAL SCIENCE

NOVEMBER 2014

PREFACE

Section 10 (1) of the Education (National Minimum Standards and Establishment of Institutions) Act, Cap E3, Laws of the Federation of Nigeria 2004, empowers the National Universities Commission to lay down minimum standards for all programmes taught in Nigerian universities. In 1989, the Commission, in collaboration with the universities and their staff, developed minimum academic standards for all the programmes taught in Nigerian universities and the Federal Government subsequently approved the documents.

After more than a decade of using the Minimum Academic Standard (MAS) documents as a major instrument of quality assurance, the Commission in 2001 initiated a process to revise the documents. The curriculum review was necessitated by the fact that the frontiers of knowledge in all academic disciplines had been advancing with new information generated as a result of research. The impact of Information and Communication Technologies on teaching and learning and the dynamics of the skills set required to face the challenge of competition engendered by globalization were also compelling reasons for the curriculum review.

Other compelling reasons included the need to update the standard and relevance of university education in the country as well as to integrate entrepreneurial studies and peace and conflict studies as essential new platforms that will guarantee all graduates from Nigerian universities the knowledge and appropriate skills, competencies and dispositions that will make them globally competitive and capable of contributing meaningfully to Nigeria's socio-economic development.

Recognising that the content-based MAS documents were rather prescriptive, a decision was taken to develop outcome-based benchmark statements for all the programmes in line with contemporary global best practice. To actualize this, the Commission organized a stakeholders' workshop to benchmark each programme in all the disciplines taught in Nigerian universities. Following comments and feedback from critical stakeholders in the universities indicating that the Benchmark-style Statements were too sketchy to meaningfully guide the development of curricula and were also inadequate for the purpose of accreditation, the Commission put in place the mechanism for the merger of the Benchmark-style Statements and the revised Minimum Academic Standards into new documents referred to as the Benchmark Minimum Academic Standards (BMAS).

The resultant documents, an amalgam of the outcome-based Benchmark statements and the content-based MAS clearly enunciates the learning outcomes and competencies expected of graduates of each academic programme without being overly prescriptive while at the same time providing the requisite flexibility and innovativeness consistent with institutional autonomy.

The first step in the process of amalgamation of the Benchmark statements and the content-based MAS was the conduct of a needs assessment survey and the publication of the findings in the report titled *Needs Assessment Surveys of Labour Market for Nigerian Graduates*. This was carried out for all the disciplines taught in Nigerian universities. The exercise involved major stakeholders particularly employers of Nigerian graduates. The objectives of the Needs Assessment Survey included identification of expected knowledge, attitudes and skills for graduates and their ability to fit into the requirements of the new national and global economy. The second stage was the organisation of a workshop at which academic experts across Nigerian universities, including Vice-Chancellors, participated with the objective of ensuring that the designed BMAS for the various disciplines took into cognizance the identified

knowledge and skill gaps. At the end of the workshop, draft BMAS documents were produced for the various programmes in the thirteen broad academic disciplines into which the Nigerian University System has been structured. Of significance was the introduction of science- and social science/humanities-based courses under the General Studies programme which are compulsory for all first- year students in Nigerian universities, irrespective of their course of study.

The documents were later sent to the Universities offering relevant disciplines for comments and input. Following the collation of the input and comments from the Universities, another workshop was held at which invited academic experts studied and incorporated the relevant comments and input received into the draft documents.

After content and language editing, by relevant experts, a one-day workshop was held at which the edited documents were harmonized to produce the final BMAS documents.

Consequent upon the afore-mentioned processes, BMAS documents were produced for the under-listed academic disciplines:

- i. Administration; Management and Management Technology;
- ii. Agriculture, Forestry, Fisheries and Home Economics;
- iii. Arts;
- iv. Basic Medical and Health Science;
- v. Education;
- vi. Engineering and Technology;
- vii. Environmental Sciences;
- viii. Law;
- ix. Pharmaceutical Sciences;
- x. Medicine and Dentistry;
- xi. Science;
- xii. Social Sciences; and
- xiii. Veterinary Medicine.

For each programme, the document contains suggestions of the status of each course in terms of *compulsory*, *required* and *elective*. Universities are encouraged to take due cognizance of the BMAS while bringing necessary innovation into the content and delivery of their programmes towards achieving their overall objectives and goals. Programmes are to be structured in such a way that a typical student does not carry less than 30 credit units or more than 48 credit units per session.

It is the Commission's expectation that this BMAS document will serve as a guide to the universities in the design of curricula for their programmes in terms of the minimum acceptable standards of input, process as well as measurable benchmark of knowledge, skills and competences expected to be acquired by an average graduate of each of the academic programmes.

Professor Julius A. Okojie, OON
Executive Secretary

PREFACE	ii
GLOSSARY OF COURSE CODES	viii
SECTION ONE:	1
BASIC ELEMENTS OF THE OPERATION OF THE BENCHMARK MINIMUM ACADEMIC STANDARDS IN ENVIRONMENTAL SCIENCE PROGRAMMES	1
1.1 Preamble	1
1.2 Programmes and Degrees	2
1.3 Philosophy and objectives of the Discipline	2
1.3.1 Philosophy and Mission Statement	2
1.3.2 Aims and Objectives of the Environmental Science Discipline	2
1.4 General Admission Requirements	3
1.5 Programme duration	4
1.6 Graduation Requirements	4
1.6.1 Course Credit System	4
1.6.2 Standard Terminologies	5
1.6.3 Grading of Courses	5
1.6.4 Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA)	6
1.6.5 Degree Classifications	6
1.6.6 Probation.....	7
1.6.7 Withdrawal	7
1.7 Evaluation	7
1.7.1 Techniques for Student Evaluation.....	7
1.7.2 External Examiners' System.....	8
1.7.3 SIWES Rating and Assessment	8
1.7.4 Students' Evaluation of courses.....	8
1.7.5 Maintenance of Curricula Relevance	9
1.7.6 Performance Evaluation Criteria.....	9
1.8 Resource Requirements	10
1.1	10
1.8.1 Personnel	10
1.8.2 Physical Facilities	11
1.8.3 Library and information Resources	12
1.9 General Studies	12
SECTION TWO:	13
COURSE STRUCTURE AND SYNOPSES OF COMMON COURSES IN ENVIRONMENTAL SCIENCES	13
2.1 Preamble	13
2.2 The Common Courses	13
2.2.1 Courses in Basic Sciences.....	13
2.2.2 General Studies Courses	14
2.2.3 Entrepreneurship	15
2.2.4 Students Industrial Work Experience Scheme (SIWES)	15
2.3 Course Synopses	17
SECTION THREE:	23
COURSE STRUCTURE AND SYNOPSES OF ENVIRONMENTAL SCIENCE DEGREE PROGRAMMES	23
3.1 ARCHITECTURE DEGREE PROGRAMME	23

3.1.1	Introduction.....	23
3.1.2	Aims and Objectives	23
3.1.3	Programme Duration.....	24
3.1.4	Admission Requirements	24
3.1.5	Graduation Requirements	24
3.1.6	Learning Outcomes.....	25
3.1.7	Instructional Modules	25
3.1.8	Resource Requirements for teaching and learning Personnel.....	27
3.1.9	Courses for Architecture Programmes	28
3.1.10	Synopses of Courses in Architecture Degree Programme	31
3.2	<i>BUILDING DEGREE PROGRAMME</i>	40
3.2.1	Introduction.....	40
3.2.2	Aims and Objectives of Building programme	40
3.2.3	Programme Duration.....	41
3.2.4	Admission Requirements	41
3.2.5	Graduation Requirements	41
3.2.6	Learning Outcomes.....	41
3.2.7	Resource Requirements for Teaching and Learning Personnel	42
3.2.8	Instructional Modules	43
3.2.9	Courses for Building Programmes	43
3.2.10	Synopses of Courses in Building Degree Programme	46
3.3	<i>ENVIRONMENTAL MANAGEMENT DEGREE PROGRAMME</i>	55
3.3.1	Introduction.....	55
3.3.2	Aims and Objectives of Environmental Management Programme.....	55
3.3.3	Programme Duration.....	56
3.3.4	Admission Requirements	56
3.3.5	Graduation Requirements	56
3.3.6	Resource Requirements for Teaching and Learning.....	56
3.3.7	Courses for Environmental Management Programmes	56
3.3.8	Synopses of Courses in Environmental Management Degree Programme.....	59
3.4	<i>ESTATE MANAGEMENT DEGREE PROGRAMME.....</i>	66
3.4.1	Introduction.....	66
3.4.2	Aims and Objectives.....	66
3.4.3	Programme Duration.....	67
3.4.4	Admission Requirements	67
3.4.5	Graduation Requirement.....	68
3.4.6	Learning Outcomes.....	68
3.4.7	Resource Requirements for Teaching And Learning.....	69
3.4.8	Courses for Estate Management Programmes	69
3.4.9	Synopses of Courses in Estate Management Degree Programme.....	72
3.5	<i>FINE ARTS DEGREE PROGRAMME</i>	82
3.5.1	Introduction.....	82
3.5.2	Aims and Objectives	82
3.5.3	Programme Duration.....	82
3.5.4	Admission Requirements	82
3.5.5	Aims and Objectives of Fine and Applied Arts Programmes	82
3.5.6	Instructional Modules	83
3.5.7	Resource Requirements for Teaching and Learning	84
3.5.8	Courses for Fine Arts Degree Programme	84
3.5.9	Synopses of Courses in Fine Arts Degree Programme	86
3.6	<i>GEOGRAPHY DEGREE PROGRAMME</i>	90
3.6.1	Introduction.....	90
3.6.2	Aims and Objectives of Geography Education programme.....	90
3.6.3	Programme Duration.....	90
3.6.4	Admission Requirements	90
3.6.5	Graduation requirements.....	91
3.6.6	Instructional Modules	91

3.6.7	Resource Requirements for Teaching and Learning.....	91
3.6.8	Courses for Geography Degree Programme	91
3.6.9	Synopses of Courses in Geography Degree Programme	94
3.7	<i>INDUSTRIAL DESIGN DEGREE PROGRAMME.....</i>	105
3.7.1	Introduction.....	105
3.7.2	Aims and Objectives.....	105
3.7.3	Programme Duration.....	105
3.7.4	Admission Requirements.....	105
3.7.5	Resource Requirement for Teaching and Learning	106
3.7.6	Courses for Industrial Design Degree Programme	106
3.7.7	Synopses of Courses in Industrial Design Degree Programmes	115
3.8	<i>LANDSCAPE ARCHITECTURE DEGREE PROGRAMME</i>	126
3.8.1	Introduction.....	126
3.8.2	Aims and Objectives.....	126
3.8.3	Programme Duration.....	127
3.8.4	Admission Requirements	127
3.8.5	Graduation Requirements	127
3.8.6	Learning Outcomes:.....	127
3.8.7	Instructional Modules	128
3.8.8	Instructional Module capabilities.....	128
3.8.9	Resource Requirements for teaching and Learning Personnel.....	129
3.8.10	Synopses of Sample Courses in Landscape Architecture Degree Programme.....	133
3.9	<i>QUANTITY SURVEYING DEGREE PROGRAMME.....</i>	138
3.9.1	Introduction.....	138
3.9.2	Aims and objectives of quantity surveying education programmes.....	138
3.9.3	Programme Duration.....	138
3.9.4	Admission Requirements	138
3.9.5	Resource Requirement for Teaching and Learning	139
3.9.6	Courses for Quantity Surveying Degree Programme.....	139
3.9.7	Synopses of Courses in Quantity Surveying Degree Programme.....	142
3.10	<i>SURVEYING & GEOINFORMATICS DEGREE PROGRAMME.....</i>	149
3.10.1	Introduction.....	149
3.10.2	Aims and Objectives	149
3.10.3	Duration of Programme	150
3.10.4	Admission Requirements	150
3.10.5	Graduation Requirements	150
3.10.6	Learning Outcomes.....	150
3.10.7	Instructional modules.....	151
3.10.8	Resource requirements for teaching and learning	151
3.10.9	Courses for Surveying and Geoinformatics Degree Programme	151
3.10.10	Synopses Courses in Surveying and Geoinformatics.....	154
3.11	<i>URBAN AND REGIONAL PLANNING DEGREE PROGRAMME</i>	161
3.11.1	Introduction.....	161
3.11.2	Aims and Objectives	161
3.11.3	Programme Duration:.....	161
3.11.4	Admission Requirements	161
3.11.5	Graduation Requirements	162
3.11.6	Instructional Modules	162
3.11.7	Resource Requirements for Teaching and Learning	163
3.11.8	Courses for Urban and Regional Planning Degree Programme.....	163
3.11.9	Synopses of Courses in Urban and Regional Planning	167
SECTION FOUR:.....		180
LABORATORY AND EQUIPMENT REQUIREMENT FOR ENVIRONMENTAL SCIENCE PROGRAMMES.....		180
4.1	<i>Centralized Laboratory and Technical Facilities.....</i>	180

Please, forward your comment on any section of this document to the following email:
nucassessment@gmail.com
You can also call the following phone numbers: 08033145087, 08033201097
All comments should be received before 31st October, 2015

4.2	<i>Specialized programme-based laboratory facilities</i>	<i>184</i>
4.2.1	<i>Architecture Programme</i>	<i>184</i>
4.2.2	<i>Building Programme</i>	<i>185</i>
4.2.3	<i>Fine Arts and Industrial Design</i>	<i>186</i>
4.2.4	<i>Geography.....</i>	<i>187</i>
4.2.5	<i>Industrial Design</i>	<i>188</i>
4.2.6	<i>Surveying and Geoinformatics.....</i>	<i>189</i>

DRAFT

GLOSSARY OF COURSE CODES

These are the 3-letter codes for the identification of courses offered in the various programmes in the Environmental Science discipline as well as courses offered in other disciplines covered in the BMAS for the Nigerian University System. Three categories of course codes are identified here namely:

Category A: Course codes for the general courses offered by all students registered in the various programmes in the Environmental Science discipline.

Category B: Course codes for courses offered by the various programmes in the Environmental Science discipline

Category C: Course code for other courses offered by the various programmes in the other disciplines outside the Environmental Science Discipline.

Category A

The Programme offering the Courses	Course Code
General Studies Courses offered at the University Level for students registered for courses in all the disciplines in the university.	GST

Category B

The Programme offering the Courses	Course Code
Architecture	ARC
Building	BUD
Estate Management	ESM
Environmental Management	EVM
Fine Arts	FAA
Geography	GEO
Industrial Design	IDD
Landscape Architecture	LAA
Quantity Surveying	QTS
Survey and Geoinformatics	SGI
Urban and Regional Planning	URP

Category C

The Programme offering the Courses	Course Code
Accounting Programme in the Administration and Management Science Discipline	ACC
Biology/Biological Science in the Science Discipline	BIO
Botany Programme in the Science Discipline	BOT
Business Administration Programme in the Administration and Management Science Discipline	BUS
Chemistry Programme in the Science Discipline	CHM
Civil Law in the Law Discipline	CIL
Economics Programme in the Social Science Discipline	ECO

Please, forward your comment on any section of this document to the following email:
nucassessment@gmail.com
You can also call the following phone numbers: 08033145087, 08033201097
All comments should be received before 31st October, 2015

Geology Programme in the Science Discipline	GLY
Microbiology Programme in the Science Discipline	MCB
Mathematics Programme in the Science Discipline	MTH
Physics Programme in the Science Discipline	PHY
Property Law in the Law Discipline	PPL
Sociology Programme in the Social Science Discipline	SOC
Statistics Programme in the Science Discipline	STA
Theatre Arts Programme in the Arts Discipline	THA

DRAFT

SECTION ONE:

BASIC ELEMENTS OF THE OPERATION OF THE BENCHMARK MINIMUM ACADEMIC STANDARDS IN ENVIRONMENTAL SCIENCE PROGRAMMES

1.1 Preamble

The Benchmark Minimum Academic Standards (BMAS) document for the Environmental Sciences provides a description and the general characteristics of the first degree programmes in the Environmental Sciences. It articulates the core areas of knowledge, understanding and skills expected of graduates from environmental science programmes in Nigerian Universities.

The benchmark statement takes into consideration, current development in the environmental design disciplines in general. New concerns about the changing environment as well as the need for life-long skills and 'market-ready' graduates have suggested the introduction of new courses in the undergraduate programme. The benchmark statements are intended to provide a broad framework within which educators can develop appropriate and challenging programmes that respond to the needs of the student, changing nature of the environment, as well as new developments in the society and technology. They seek to articulate the primary qualities expected of Bachelor's degree graduates and to maintain the standards of education in the environmental sciences subject area.

The purpose of the Benchmark Minimum Academic Standards (BMAS) Statement is to:

- a) Assist the Nigerian University System in the designing, approval and accreditation of programmes of study.
- b) Assist professional bodies in their accreditation and review of programmes relating to professional competence.
- c) Assist Students, Employers and internal Organisations seeking information about education in the Environmental Sciences discipline.

The benchmark statement is made up of four major component parts as follows:

- a) The objectives and purpose of the bachelor degree in different programmes
- b) The competencies, abilities and skills expected of a graduate of the different programmes.
- c) Assessment procedures and criteria for evaluating the body of knowledge covered and different levels of abilities and skills attained.
- d) The essential courses expected to be covered in the programme leading to the award of undergraduate and professional postgraduate degrees

1.2 Programmes and Degrees

Table 1.1 below includes a list of programmes and the degrees in view covered in the current BMAS document for Environmental Sciences.

List of Programme(s) and Degree(s) in View

S/N	PROGRAMME	DEGREE(S) IN VIEW
1.	Architecture	B.Sc.(Arch.) /B. Tech.(Arch), MSc (Arch), M.Tech (Arch)
2.	Building	B.Sc./B. Tech.
3.	Environmental Management	B.Sc. /B. Tech.
4.	Estate Management	B.Sc. /B. Tech.
5.	Fine Arts	B.A.
6.	Geography	B.Sc.
7.	Industrial Design	B.A./B.Sc./B.Tech.
8.	Landscape Architecture	B.Sc./B. Tech.
9.	Quantity Surveying	B.Sc./B. Tech.
10.	Survey and Informatics	B.Sc./B. Tech.
11.	Urban and Regional Planning	B.Sc./B. Tech./B.URP.

1.3 Philosophy and objectives of the Discipline

1.3.1 Philosophy and Mission Statement

Environmental Sciences deal with the planning, design, construction, management and conservation of man-made and natural environments. The various disciplines that constitute environmental sciences are concerned with ordering the surface of the earth with a view to making it functionally appropriate, aesthetically pleasing, culturally relevant, environmentally healthy, and at the same time, optimally utilizing available resources economically without disrupting the balanced eco-system. While acknowledging that each programme will have its own detailed rationale for the content, nature and organization, it is expected that certain ideas and principles underpin studies in the environmental sciences. In Nigeria, programmes in the Environmental Science discipline will aim to produce competent graduates with sufficient contemporary theoretical knowledge and practical skills to deal with planning, design, construction, management and conservation of man-made and natural environment. The objectives of the different programmes are presented in their specific sections of this document.

1.3.2 Aims and Objectives of the Environmental Science Discipline

Programmes in the Environmental Sciences will normally aim to:

- i) Create a deeper awareness of the global/earth systems and their interaction with human systems
- ii) Create an understanding of the interdisciplinary and multidisciplinary nature of environmental issues
- iii) An exposition of temporal and spatial scales of environmental challenges and the various approaches and options for remediation, adaptation and mitigation
- iv) Provide robust programmes of training including current knowledge and practice relating to the different disciplines that enable students develop sound understanding of the principles and ideas underpinning such disciplines.

- v) Afford students the opportunity to develop a range of subject specific and transferable skills to support their studies and prepare them for employment
- vi) Provide supportive learning environments that allow students the opportunity to realize their academic potentials
- vii) Enable students develop skills of reflection, critical analysis, communication and the capacity for independent as well as team work

Students should possess:

- a) Proficiency in written and oral communication skills
- b) Problem-solving skills, relating to both qualitative and quantitative information, especially where information is limited.
- c) Computational and numerical skills
- d) Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.
- e) Information technology skills such as word processing and spreadsheet use, data-logging and storage and Internet communication.
- f) Interpersonal skills relating to working in multi-disciplinary teams.
- g) Time-management and organizational skills.
- h) Study skills needed for continuing professional development and research

1.4 **General Admission Requirements**

Candidates may be admitted into the degree programmes through any of the following entry modes:

- Unified Tertiary Matriculation Examinations (UTME) admissions
- Direct Entry admissions
- Inter-University Transfer admissions

UTME Entry Mode

Candidates who have successfully completed the Senior Secondary School or its equivalent and obtained five credits (in not more than two attempts) in English Language, Mathematics, and any other three relevant subjects to the programme of choice will be eligible for admission currently through the Unified Tertiary Matriculation Examinations (UTME)

Direct Entry Admission Mode

Candidates who fulfil the requirements for UTME admission and who have obtained General Certificate of Education (GCE), Advanced Level; Higher School Certificate (HSC)/Interim Joint Matriculation Board (IJMB), National Diploma (ND) or other approved equivalent qualifications by Federal Ministry of Education in two relevant subjects to a particular programme, at a sitting, may be admitted into the 200 level

Inter-University transfer admission mode

Candidates who are already enrolled in a programme of study in one Nigerian university or a similarly approved institution may be allowed for very good reasons to transfer to a similar programme in another University and absorbed into the programme at the appropriate level.

1.5 Programme duration

Degree programmes in Environmental Sciences shall normally be for a minimum of eight (8) or ten (10) academic semesters for UTME entry mode students and six (6) or eight (8) academic semesters for Direct Entry admission candidates. Further details of programme duration are available in the statements for the different programmes in the current BMAS.

1.6 Graduation Requirements

1.6.1 Course Credit System

Academic work in the Environmental Sciences is organized in concentrated modules of subject materials referred to as courses. Each course is planned as a complete unit of study with a scheduled amount of instructional/contact hours each semester.

Credits are weights attached to a course. One credit is equivalent to one hour per week per semester of 15 weeks of lectures or three hours of laboratory/studio/workshop work per week per semester of 15 weeks

Definition of Course System

This should be understood to mean a quantitative system of organization of the curriculum in which subject areas are broken down into unit courses which are examinable and for which students earn credit(s) if passed. The courses are arranged in progressive order of complexity or in levels of academic progress, e.g. Level or year I courses are 100, 101 etc and Level II or year II courses are 200, 202 etc.

The second aspect of the system is that courses are assigned weights allied to Units.

Units

Consist of specified number of student-teacher contact hours per week per semester. Units are used in two complementary ways: one, as a measure of course weighting, and the other, as an indicator of student work load.

- (i) As a measure of course weighting for each Unit course (e.g) HIS 105, ZOO 203, ARCH 504), the credit unit to be earned for satisfactorily completing the course is specified; e.g. a 2-credit unit course may mean two 1-hour lecture per week per semester or one 1-hour lecture plus 3-hour practical per week per semester.
- (ii) As a measure of work load, "One Credit Unit" means one hour of lecture or one hour of tutorial per week per semester. For other forms of teaching requiring student teacher contact, the following equivalents may apply:
two hours of seminar: three hours of laboratory or field work, Clinical practice/practicum, studio practice or stadium sporting activity, six hours of teaching practice; four weeks of industrial attachment where applicable.

Normally, in Course Credit System, courses are mounted all year round, thus enabling students to participate in examinations in which they are unsuccessful or unable to participate on account of ill health or for other genuine reasons. In such a system, no special provisions are made for re-sit examinations.

The minimum number of credit units for the award of a degree is 120 units, subject to the usual Department and Faculty requirements. A student shall therefore qualify for the award of a degree when he has met the conditions.

The minimum credit load per semester is 15 credit units.

For the purpose of calculating a student's cumulative GPA(CGPA) in order to determine the class of Degree to be awarded, grades obtained in **ALL** the courses whether compulsory or optional and whether passed or failed must be included in the computation.

Even when a student repeats the same course once or more before passing it or substitutes another course for a failed optional course, grades scored at each and all attempts shall be included in the computation of the GPA. Pre - requisite courses must be taken and passed before a particular course at a higher level.

1.6.2 Standard Terminologies

The following standard terminologies are used for different categories of courses.

i. **Core/Compulsory Course:**

A course which every student must compulsorily take and pass in any particular programme at a particular level of study.

ii. **Elective Course**

A course that students take within or outside the faculty. Students may graduate without passing the course provided the minimum credit unit for the course had been attained.

iii. **Optional Course**

A course which students can take based on interest and may count towards the minimum credit unit required for graduation.

iv. **Pre-requisite Course**

A course which student must take and pass before taking a particular course at a higher level.

v. **Required Course**

A course that you take at a level of study and must be passed before graduation.

1.6.3 Grading of Courses

At the end of each course, a grade comprising a percentage score and a corresponding letter grade is awarded to each student. These grades will include the results of both formative and summative assessments conducted throughout the Programme duration. Range of percentage scores, letter grades and numerical grade point equivalents are indicated in the Table: 1.2 below:

Grading System

Score (%)	Letter Grade	Grade Point equivalent
70 – 100	A	5.0
60 – 69	B	4.0
50 – 59	C	3.0
40 – 45	D	2.0
40 – 44	E	1.0
Below 40	F	0.0

1.6.4 Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA)

A system of Grade Point Average (GPA) and Cumulative Grade point Average (CGPA) is currently in use in the Nigerian University system. Grade Point Average and Cumulative Grade Point Average are calculated as numerical representations of a student's quality of performance. These averages are used to determine if a student qualifies for certain academic actions (e.g., probation, graduation and class of degree). A student's Grade Point Average (GPA) is the weighted mean value of all grade points earned through examinations and other forms of formal assessment in a particular academic semester/session. While the Cumulative Grade Point Average (CGPA) is the weighted mean value of all the Grade Point Averages earned since enrolment on the particular programme.

For the purpose of determining a student's standing at the end of every semester, the Grade Point Average (GPA) system shall be used. The GPA is computed by dividing the total number of Units x Grade Point (TUGP) by the total number of units (TNU) for all the courses taken in the semester as illustrated in Table 2.3.

The Cumulative Grade Point Average (CGPA) over a period of semesters is calculated in the same manner as the GPA by using the grade points of all the courses taken during the period.

Calculation of GPA or CGPA

Course	Units	Grade Point	Units x Grade Point (UGP)
C ₁	U ₁	GP ₁	U ₁ x GP ₁
C ₂	U ₂	GP ₂	U ₂ x GP ₂
-	-	-	-
-	-	-	-
C _i	U _i	GP _i	U _i x GP _i
-	-	-	-
-	-	-	-
C _N	U _N	GP _N	U _N x GP _N
TOTAL	TNU		TUGP

$$TNU = \sum_{i=1}^N U_i \quad TUGP = \sum_{i=1}^N U_i * GP_i \quad CGPA = \frac{TUGP}{TNU}$$

1.6.5 Degree Classifications

Students are ordinarily expected to register for a minimum of 18 units each semester including all compulsory and required courses. Courses in all the programmes are normally taught for a semester of fifteen (15) weeks duration. In addition to these general provisions, students are expected to satisfy the specific requirements of individual programmes with regards to compulsory and required courses in order to qualify for graduation.

The overall performance of each student shall be based on a 5-point scale Cumulative Grade Point Average (CGPA) system. Degree qualifications are classified as follows:

Degree Classification

Cumulative Grade Point Average (CGPA)	Class of Degree
4.50 – 5.00	1 st Class Honours
3.50 – 4.49	2 nd Class Honours (Upper Division)
2.40 – 3.49	2 nd Class Honours (Lower Division)
1.50 – 2.39	3 rd Class Honours

For students enrolled on a four (4) or five (5) year degree programme, a maximum period of ten (10) or twelve (12) semesters respectively is allowed for an honours degree. Any additional period of study beyond this will qualify the candidate for the award of a pass degree. Candidates admitted into any of the programmes through direct entry, will normally be allowed eight or ten semesters for 4- and 5-year programmes respectively to earn an honours degree.

A student will normally be allowed to remain on a programme for a period not exceeding 1½ times the stipulated Programme Duration.

1.6.6 Probation

A student shall be placed on academic probation if at the end of the second semester of an academic year the student earns less than 1.5 Cumulative Grade Point Average (CGPA). During Probation, a student will be expected to register for all failed courses as well as other compulsory and required courses which the student may have failed to register for in an attempt to improve the CGPA.

A student on probation may be allowed to register for courses at the next higher level in addition to his/her probation level courses provided that:

- i. the regulation in respect of student work-load is complied with; and
- ii. Pre-requisite courses for the higher-level courses have been passed.

1.6.7 Withdrawal

A student shall be asked to withdraw from a particular programme if at the end of a probation period the student fails to make satisfactory progress (CGPA at least above 1.5). Such a student may however be allowed a change of programme within the same university or alternatively asked to withdraw from the university.

1.7 Evaluation

1.7.1 Techniques for Student Evaluation

The primary goal of assessment is to improve the overall quality of learning as well as evaluate the quality of instruction. It is recommended that different types of formative and summative evaluation methods be adopted through the semester for all course offered in the environmental science discipline. The list below though not exhaustive, highlights some of the more common methods of assessment that may be adopted for students' courses performance evaluation:

- Problem Solving Exercises
- Term Papers/Essay Assignments
- Individual Project Work
- Oral Presentations
- Design studio exercises
- Surveys and Evaluation reports

- Laboratory Reports
- Collaborative Project Work
- Report on External Placement (SIWES)
- End of semester examinations
- External Examination Reports

Assessment of theory subjects

Assessment used for theory subjects should include continuous monitoring of student's progress by subject lectures through course work evaluation. Continuous assessment may involve class tests, tutorial assignments, seminar presentations, and reports on fieldwork, class attendance and so on. These should carry between 30% and 60% of the total weighting for any subject. The final end of semester examination will normally account for the balance of 40% to 70% of the overall marks for the subjects.

Assessment of Studio projects

The regular formative review of design studio projects is encouraged as an important part of the learning process. Students are required to present their work to an audience that may comprise fellow students, studio staff or visiting studio critics at least at the end of each project. Feedback and scores may be given in these instances. The summative assessment of the design studio work is usually carried out by well-informed assessors based on predetermined assessment criteria. Scores in these assessments are usually very subjective and rely on the judgements of the expert assessors.

1.7.2 External Examiners' System

The involvement of external examiners from other universities is a crucial quality assurance requirement for all courses in Nigerian University System. In this regard, external examiner should go beyond mere moderation of examination questions to examining of examination papers to scope and depth of examination questions vis a vis the curricular expectation.

1.7.3 SIWES Rating and Assessment

Environmental Science students shall be exposed to a combination of field and office experience both in the public or private sectors relevant to their various disciplines. This is achieved through the students' participation in the supervised Student Industrial Work Experience Scheme (SIWES). SIWES shall be undertaken in an approved establishment. A minimum period of 24 weeks of SIWES should be undertaken as part of the graduation requirements.

At the end of the SIWES programme, each participating students' is required to submit a systematic log-book for assessment by the programme in addition to undergoing any other forms of assessment as may be required by individual programmes and institutions. Individual programmes will be expected to allocate credit unit ratings to the SIWES training programme that count towards the requirements for graduation. Students with unsatisfactory performance in SIWES shall be required to repeat the training programme.

1.7.4 Students' Evaluation of courses

As an integral part of the course credit system, students will be given the opportunity to evaluate the courses taken in the semester based on the following criteria:

- a. Course relevance

- b. Adequacy in terms of time and content coverage
- c. Students understanding of the courses
- d. Adequacy of Teaching, tutorials and practicals technology/aids
- e. Instructor evaluation

The students' course evaluation is aimed at improving the efficiency of course delivery by offering timely feedback to the course lecturers/instructors. It is expected that each programme will work out a mechanism to achieve this goal.

1.7.5 Maintenance of Curricula Relevance

The various curricula for Environmental Sciences should be reviewed regularly as reflected in each individual programme. It is recommended that general reviews be conducted at least once every five (5) years, in full consultation with the relevant professional bodies.

One of the well-established modes for maintaining programme and curricula relevance is through accreditation exercises. The detailed procedures for programme validation and accreditation may be found in relevant sections of programme accreditation guidelines for the various professional bodies.

The general performance indicators useful for programme accreditation and for internal programme reviews are as specified in individual programmes in terms of the following:

- Programme content and delivery
- Staff composition and quality
- Student admissions, retention and graduation
- Available Facilities: spaces and equipment
- Employers ratings of graduates
- Overall programme administration

1.7.6 Performance Evaluation Criteria

The accreditation of the Engineering and Technology degree programme means a system of recognising educational institutions (universities and programmes offered by them) for a level of performance, integrity and quality which entitles them to the confidence of the educational and professional community, the public they serve, and employers of labour.

The objectives of the accreditation exercise are to:

- i. Ensure that at least the provisions of the minimum academic benchmark statements are attained, maintained and enhanced.
- ii. Assure employers and other members of the community that graduates of these institutions have attained an acceptable level of competence in their areas of specialisation.
- iii. Certify to the international community that the programmes offered in these universities are of high standards and that their graduates are adequate for employment and for further studies.

1.8 Resource Requirements

1.8.1 Personnel

The personnel requirements for each of the programmes should reflect student population and the variety of activities to be performed in the classrooms, studios, laboratories and workshops. The ratios should conform to the NUC minimum guidelines on staff/student ratio of 1:15 for the Discipline.

a) Academic Staff

The point of entry for each of the recognized academic positions should reflect appropriate academic qualifications, and experience in both teaching and professional practice. Details of the requirements for the various positions are indicated below:

Qualifications for Appointments/Promotion of Academic Staff

	LEVEL	QUALIFICATIONS
i.	Graduate Assistant	A good Bachelor's Degree (with a minimum Second Class Upper Division) This is a training position, and staff in this category are expected to complete their Master's degree within two years of their appointment.
ii.	Assistant Lecturer	A Master's Degree in addition to a good Bachelor's Degree.
iii.	Lecturer II	<ul style="list-style-type: none"> • A PhD Degree for direct appointment; • By promotion from Assistant Lecturer rank after a minimum of three years in addition to fulfilling other promotion requirements
iv.	Lecturer I	In addition to the qualifications specified for Lecturer II, Lecturer I should have had at least three years post-doctoral teaching experience and demonstrated ability for research work and evidence of scholarship.
v.	Senior Lecturer	A PhD Degree in addition to meeting the requirements for publications, teaching and other conditions stipulated in the guideline.
vi.	Reader (Associate Professor)	Basic qualifications set out for Senior Lecturer plus at least three years of experience. Must have considerable publications resulting from research as well as demonstrated academic leadership ability. A Reader should have evidence of participation in University administration and community activities. External assessment is required for promotion to the level of a Reader.
vii.	Professor	Basic qualifications as for Reader/Associate Professor. Must have had at least three years of experience as Reader/Associate Professor in addition to meeting the necessary publications. A Professor should demonstrate clear evidence of scholarship as well as academic and administrative/professional leadership.

- b) **Academic Support Personnel**
Teaching Assistant/Demonstrators are recommended to assist lecturers in the conduct of tutorials, practicals and fieldwork.
- c) **Administrative Support Personnel**
The services of the administrative support staff are indispensable in the proper administration of the departments and faculty offices. These will normally include confidential secretaries, clerical officers, typists, messengers and cleaners. It is important to recruit very competent senior personnel who are technology savvy.
- d) **Technical Support Personnel**
The technical support personnel shall consist of technical officers and technologists. It is important to recruit very competent senior technical staff to maintain teaching and research equipment.

1.8.2 Physical Facilities

- a) **Spaces**
For the good administration of each programme, adequate facilities should be provided for the office of the Dean and for each of the departments. The required minimum standards for each of the programmes are reflected in the relevant sections for each programme. Spaces will normally include:
- i. Office Accommodation
 - ii. Classroom Space
 - iii. Studio Space
 - iv. Seminar Rooms
 - v. Drawing Offices
 - vi. Workshop Spaces
 - vii. Library

In the case of the Office of the Dean, office accommodation should be provided as follows:

- i. Dean's Space
- ii. Vice Dean/Sub-Dean
- iii. Secretary to the Dean
- iv. Assistant Registrar
- v. Administrative Secretariat
- vi. General Office
- vii. Conference Room
- viii. Faculty Office

Minimum Space Recommendations

	Space	Use	Minimum (m ²)
1.	Professors Office	Academic	24
2.	Head of Department	Administration	24
3.	Senior Lecturer	Academic	20
4.	Lecturer	Academic	46
5.	Assistant lecturer	Academic	12
6.	Senior Technical Staff	Technical	12

	Space	Use	Minimum (m²)
7.	Senior Administrative Staff	Administration	12
8.	Junior Technical Staff	Technical	6
9.	Junior Administrative Staff	Administration	4
10.	Studio Space	Students	3
11.	Lecturer Space	Students	0.5
12.	Seminar Space	Students	0.5
13.	Laboratory Space	Students	2
14.	Library	Students	2
15.	Social Space	Students	0.5
16.	Storage Space	Students	0.5

b) **Equipment**

Each Faculty/programme should be provided with requisite laboratories, studios and workshops with relevant equipment in relation to student population and variety of activities performed in each programme. To achieve the benchmark standards for any programme, there should be:

- i. A minimum number of well-equipped laboratories for each programme that meet the minimum space standards for the particular programme.
- ii. Well-equipped drawing and design studios in accordance with the recommended space requirements.

1.8.3 **Library and information Resources**

Each Faculty/School should be provided with fully equipped library and information technology centre with computers and Internet connectivity and quick reference books, periodicals, journals and audio-visual materials. Such library and information resources will be additional to the University central library facilities.

1.9 **General Studies**

Goal

To produce a well rounded morally and intellectually capable graduates with vision and entrepreneurial skills in an environment of peace and social cohesiveness.

Objectives

The objectives of the General Studies programme consist of the following:

- a) Acquisition, development and inculcation of the proper value-orientation for the survival of the individual and society.
- b) The development of intellectual capacities of individuals to understand, appreciate and promote peaceful co-existence.
- c) Producing graduates with broad knowledge of the Nigerian Nation and people with a view to inculcating in them mutual understanding and patriotism.
- d) Exposing graduates of Nigerian Universities to the rudiments of ICT for computer literacy and ability to live usefully in this ICT age.
- e) Preparing students for a post university life with opportunities for job creation and entrepreneurial skills.
- f) Production of graduates capable of communicating effectively (both oral and written).

The details of the courses under the general studies are presented in Section 2.

SECTION TWO:**COURSE STRUCTURE AND SYNOPSES OF COMMON COURSES IN ENVIRONMENTAL SCIENCES****2.1 Preamble**

With the exception of a few programmes, the under listed foundation courses are compulsory for all candidates registered in any of the degree programmes in the Environmental Science discipline. These courses will normally be taken at the 100- and 200-levels of study.

2.2 The Common Courses

The foundation courses are basically in four categories:

- Courses in the basic sciences of mathematics, chemistry and physics
- General Studies
- Entrepreneurship
- Student Industrial Work Experience

2.2.1 Courses in Basic Sciences

The foundation courses in basic sciences compulsory for environmental science students irrespective of their programmes are mainly Mathematics (MTH 101, MTH 102) and Physics (PHY 101, PHY 107). The number of units of these courses to be taken at the 100 level is presented below. Also presented below are other mathematics, statistics, chemistry courses and physics courses taken in some of the programmes at different levels. Such courses are indicated as electives.

Science Courses

Course Code	Course title	Units	Status	LH	PH
CHM 101	General Chemistry I	3	E	45	
CHM 102	General Chemistry II	3	E	45	
CHM 107	General Chemistry I (Practical)	1	E	-	45
CHM 108	General Chemistry II (Practical)	1	E	-	45
MTH 101	Elementary Mathematics I	3	C	45	-
MTH 102	Elementary Mathematics II	3	C	45	-
MTH 103	Elementary Mathematics III	3	E	45	-
MTH 209	Introduction to Numerical Analysis	3	E	45	-
MTH 308	Introduction to Mathematical Modelling	3	E	45	-
MTH 318	Numerical Analysis I	3	E	45	-
PHY 101	General Physics I	3	C	45	-
PHY 102	General Physics II (Electricity, Magnetism and Waves)	3	E	45	-
PHY 103	General Physics III (Molecular)	3	E	45	-
PHY 107	Experimental Physics	2	C	-	90
PHY 361	Electronics I	3	E	30	45
PHY 383	Introduction to Geophysics I	2	E	30	-
STA 203	Statistics for Physical Sciences and Engineering	3	E	45	-
TOTAL		45			

2.2.2 General Studies Courses

The aim of the General Studies Programme is to expose students to a course of liberal education through which they can develop and expand their awareness of their social, cultural and natural environments. The goal is to produce well-rounded graduates that are intellectually sound, competent in the use of English Language.

Goal

To produce a well-rounded morally and intellectually capable graduates with vision and entrepreneurial skills in an environment of peace and social cohesiveness.

Objectives

The objectives of the General Studies programme consist of the following:

- Acquisition, development and inculcation of the proper value-orientation for the survival of the individual and society.
- The development of intellectual capacities of individuals to understand, appreciate and promote peaceful co-existence.
- Producing graduates with broad knowledge of the Nigerian Nation and people with a view to inculcating in them mutual understanding and patriotism.
- Exposing graduates of Nigerian Universities to the rudiments of ICT for computer literacy and ability to live usefully in this ICT age.
- Preparing students for a post university life with opportunities for job creation and entrepreneurial skills.
- Production of graduates capable of communicating effectively (both oral and written).

Students are expected to register for at least 16 units of GST courses from among the courses tabulated in the two tables below.

Recommended 100 level General Studies Course for Environmental Science programmes

Course Code	Course Title	Units	Status	LH	PH
GST 111	Communication in English I	2	C	30	-
GST 112	Logic, Philosophy & Human Existence	2	C	30	-
GST 113	Nigerian peoples and Cultures	2	R	30	-
GST 121	Use of Library, Study Skills & ICT	2	C	30	-
GST 122	Communication in English II	2	C	30	-
GST 125	Contemporary Health Issues	2	R	30	-
	Total 100 level	12			

Recommended 200 level General Studies Course for Environmental Science programmes

Course Code	Course Title	Units	Status	LH	PH
GST 211	Environment and Sustainable Development	2	C	30	-
GST 222	Peace Studies and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
GST 224	Leadership Skills	2	R	30	-
	Total 200 level	8			

General Studies: Course structure

Course Code	Course Title	Units
GST 111	Communication in English I	2
GST 112	Logic, Philosophy and Human Existence	2
GST 113	Nigerian Peoples and Culture	2
GST 121	Use of Library, Study Skills and ICT	2
GST 122	Communication in English II	2
GST 125	Contemporary Health Issues	2
GST 211	Environment and Sustainable Development	2
GST 222	Peace and Conflict Resolution	2
GST 223	Introduction to Entrepreneurial Skills	2
GST 224	Leadership Skills	2
GST 311	Entrepreneurship	2

2.2.3 Entrepreneurship

Towards Nigeria's quest for accelerated economic growth, it is important that active and virile youth population is assisted to develop and convert their innovative ideas into business ventures. These skills can be acquired particularly by those not so innately inclined. This underscores the need to actively promote and train students to be entrepreneurial within our educational system. The course aims at re-orientating students towards a job-creation mind-set rather than the fixed attitude of job-seeking. It will equip them with the skills required in establishing businesses or making them add value to existing systems, if employed in organizations. The main objective is to introduce students to concepts and opportunities available in entrepreneurship and innovation. It assumes no previous knowledge and takes students through the rudiments of entrepreneurship to selecting a desired business and starting it with a Feasibility Report.

The specific objectives of the GST 223 (Introduction to Entrepreneurial Skills) and GST 311 (Entrepreneurship), also to be taught under the General Studies Programme as reflected in the above table, are to enable students to:

- Understand the relationship of enterprise, entrepreneur, business, entrepreneurship, innovation and creativity.
- Analyse the historical perspective of entrepreneurship in Nigeria, and relate it to the recent trend of unemployment, under-employment and job dissatisfaction, personal, national and global economic recession.
- Identify the roles of entrepreneurial development agencies and regulatory bodies.
- Cultivate the spirit of entrepreneurship.
- Correct wrong attitudes and mind-sets and develop high entrepreneurial potential in student.
- Select possible business ideas.
- Build the capacity to develop business plan to start a business.

2.2.4 Students Industrial Work Experience Scheme (SIWES)

An important aspect of the education and training of environmental science students in the universities is the organised exposure to some elements of industrial/field experience as articulated below under the Students Industrial Work Experience Scheme (SIWES). The industrial work experience scheme is intended as integral part of the

students' academic programme. SIWES programmes will normally be coordinated centrally by an appropriately constituted university unit whose remit will include the following:

- Soliciting co-operative placements (jobs) in business, industry, government or service agencies depending upon the needs and qualifications of the student, and placing students on such training assignments after analysing the technical contents.
- Coordinating and supervising the co-operative employment of students in such a way that students have the opportunity of acquiring useful programme specific and lifelong skills on real jobs and under actual working conditions.
- Conducting follow-up activities regarding all placements
- Assembling individual inventory records of students and employers for the purposes of placements and supervision in addition to maintaining functional departmental and personal records and reports.
- Providing necessary advice to students as to the relevance of their chosen field to the industrial requirements of the country.
- Organizing and conducting students' seminars on placement related issues.
- Liaison with NUC, ITF, other agencies and industries on student industrial training programme of the University.

Students SIWES programme requirements vary across the different programmes in the Environmental Science discipline. The SIWES duration is expected to cover 24 weeks with credit rating of 6 units.

SIWES, as a course, will normally be assigned course codes by the different programmes, and will include the following:

- Working successfully in the industry for the specified period.
- Submission of a Work Report to the Industrial Training Coordinating Centre at the end of the training period.
- Presentation of seminar on the industrial training experience.

2.3 Course Synopses

Presented below are the synopses of all the courses presented in Tables 2.1, 2.2 and 2.3. The Units of each course, the number of lecture hours (LH) and the number of practical hours (PH), for those with practical component, have been indicated.

100-Level Courses

Students take most of these courses from the Faculty of Science and also the General Studies and Entrepreneurial Unit, where the latter exists in a university.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry)

(3 Units: LH 45)

Elementary set theory, subsets, and union, intersection, complements and Venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series, theory of Quadratic equations, Binomial theorem, complex numbers, algebra of complex numbers, the Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

MTH 102: Elementary Mathematics II (Calculus)

(3Units: LH 45)

Functions of a real variable, graphs, limits and idea of continuity. The derivative, as limit of rate of change. Techniques of differentiation, maxima and minima. Extreme curve sketching, integration, Definite integrals, reduction formulae, application to areas, volumes (including approximate integration: Trapezium and Simpson's rule).

MTH 103: Elementary Mathematics III

(3 Units: LH 45)

(Vectors, Geometry and Dynamics)

Geometric representation of vectors in 1-3 dimensions, components direction cosines, Addition and Scalar, Multiplication of vectors, linear independence, scalar and vector products of two vectors. Differentiation and integration of vectors with respect to a scalar variable. Two-dimensional co-ordinate geometry. Straight lines, circles, parabola, ellipse, hyperbola, tangents, normal..kinematics of a particle. Components of velocity and acceleration of a particle moving in plane, Force, Momentum, laws of motion under gravity, projectiles, resisted vertical and motion elastic string, simple pendulum impulse. Impact of two smooth-spheres and of a sphere on a smooth sphere. Vector equations lines and planes

MTH 209: Introduction to Numerical Analysis

(3 Units: LH 45)

Solution of algebraic and transcendental equations. Curve fitting. Error analysis. Interpolation and approximation. Zeros or non-linear equation to one-valued systems of linear equations Numerical differentiation and integral equations. Initial value problems for ordinary differential equations.

MTH 308: Introduction to Mathematical Modelling

(3 Units: LH 45)

Methodology of model building; Identification, formulation and solution of problems, cause-effect diagrams. Equation types. Algebraic. Ordinary differential, partial differential, difference; integral and functional equations. Application of mathematical models to physical, biological, social and behavioural sciences

MTH 318: Numerical Analysis I (3 Units: LH 45)

Solution of linear difference equations. Implicit and explicit multistep methods for solving initial problems. Analysis of convergence, multistep methods Runge Kuta methods. Theorem about convergence of Runge-Kuta methods. Numerical methods for solving stiff systems of ordinary differential equations.

STA 203: Statistics for Physical Sciences and Engineering (3 Units: LH 45)

Measures of central tendency and dispersion (grouped and ungrouped): mean-arithmetic, geometric, median, mode, qualities, deciles and percentiles. Empirical relation between means, median, and mode relationship and absolute dispersion. Simple space and events as sets. Finite probability space; properties of probability statistical independence and conditional probability. Tree diagram. Bayes theorem. Discrete and continuous random variables. Expectation. Independent Bernoulli trails. Binomial distribution and normal distributions. Normal approximation to binomial and Poisson distributions. Hypergeometric.

PHY 101: General Physics I (Mechanics, Thermal Physics and Waves)

(3 Units: LH 45)

Space and Time, Units and Dimension, Kinematics; Fundamental Laws of Mechanics, statics and dynamics; work and energy; Conservation laws. Moments and energy of rotation; simple harmonic motion; motion of simple systems; Elasticity; Hooke's law, Young's shear and bulk moduli, Hydrostatics; Pressure; buoyance, Archimedes' Principles; Surface tension; adhesion, cohesion, capillarity, drops and bubbles; Temperature; heat; gas laws; laws of thermodynamics; kinetic theory of gases; Sound. Types and properties of waves as applied to sound and light energies. Superposition of waves. Propagation of sound in gases, solids and liquids and their properties. The unified spectra analysis of waves. Applications.

PHY 107: General Practical Physics I (1 Unit: PH 45)

This introductory course emphasizes quantitative measurements, the treatment of measurement errors, and graphical analysis. A variety of experimental techniques will be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity, etc., covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics I (1 Unit: PH 45)

This is a continuation of the experiments designed for PHY 101 and PHY 102 some of which have been covered under PHY 107.

PHY 361: Electronics I (3 Units: LH 30 PH 45)

Transistor – biasing, characteristics and load line. Biasing methods – advantages and disadvantages. Multistage amplifiers. DC amplifiers (Darlington pair, difference amplifier and chopper amplifier) - features, operation and applications. Power amplifiers - Class A, AB, B, and C. Efficiency of class B. Basic amplifier circuit design, features, operation and applications. Frequency response and bode plots of ac and dc amplifiers. Small signal amplifiers and hybrid (h) parameters. Oscillators – Phase shift, Wien bridge, Hartley, Colpitt and Crystal (Pierce, Miller etc) oscillators. LC tank circuit. Relaxation oscillators – astable, monostable and bistable multivibrators (basic circuit, features,

operation and applications.). Transistors, OAs and diodes in switching circuits – TTL, DTL etc.

PHY 383: Introduction to Geophysics I (2 Units: LH 30)

Limitations of geophysical exploration methods. Potential field geophysics (gravity and magnetic) methods: Concepts, field equipments, data acquisition, interpretation and uses. Spontaneous potential (SP) and Electrical Resistivity (ER) methods; current density and conductivity of rocks, potential distribution in homogenous earth, apparent resistivity, ER field equipments, data acquisition and data interpretation.

CHM 101: General Chemistry I: (3 Units: LH 45)

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces; Structure of solids. Chemical equations and stoichiometry; Chemical bonding and intermolecular forces, kinetic theory of matter. Elementary thermochemistry; rates of reaction, equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II (3 Units: LH 45)

Historical survey of the development and importance of Organic Chemistry; Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I (1 Unit: PH 45)

Laboratory experiments designed to reflect topics presented in courses CHM 107 and CHM 108. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II (1 Unit: PH 45)

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

PHY 102: General Physics II (Electricity, Magnetism and Waves)

(3 Units: LH 45)

Electrostatics, conductors and currents: Dielectric: Magnetic fields and induction; Maxwell's equation: Electromagnetic oscillations and waves; Applications.

PHY 103: General Physics III (Molecular) (2 Units: LH 30)

Molecular treatment of the properties of matter; Elasticity: Hook's Law Young's Shear and Bulk moduli. Hydrostatics: Pressure: Buoyancy: Archimedes Principle. Hydrodynamics: Streamlines, Bernoulli's and continuity equations; turbulence: Reynold's number. Viscosity; laminar flow; Poiseuille's equation; Surface tension; adhesion, cohesion, capillarity; drops and bubbles. Temperature; the Zeroth law of

thermodynamics; heat gas laws; laws of thermodynamics; kinetic theory of gases; Applications.

GST 111: Communication in English I: (2 Units: LH 30)

Effective communication and writing in English Language skills, essay writing skills (organization and logical presentation of ideas, grammar and style), comprehension, sentence construction, outlines and paragraphs.

GST 112: Logic, Philosophy and Human Existence (2 Units: LH 30)

A brief survey of the main branches of Philosophy; Symbolic logic; Special symbols in symbolic logic-conjunction, negation, affirmation, disjunction, equivalent and conditional statements, law of tort. The method of deduction using rules of inference and bi-conditionals, qualification theory. Types of discourse, nature or arguments, validity and soundness, techniques for evaluating arguments, distinction between inductive and deductive inferences; etc. (Illustrations will be taken from familiar texts, including literature materials, novels, law reports and newspaper publications).

GST 113: Nigerian Peoples and Culture (2 Units: LH 30)

Study of Nigerian history, culture and arts in pre-colonial times; Nigerian's perception of his world; Culture areas of Nigeria and their characteristics; Evolution of Nigeria as a political unit; Indigene/settler phenomenon; Concepts of trade; Economic self-reliance; Social justice; Individual and national development; Norms and values; Negative attitudes and conducts (cultism and related vices); Re-orientation of moral; Environmental problems.

GST 121: Use of Library, Study Skills and ICT (2 Units: LH 30)

Brief history of libraries; Library and education; University libraries and other types of libraries; Study skills (reference services); Types of library materials, using library resources including e-learning, e-materials, etc.; Understanding library catalogues (card, OPAC, etc.) and classification; Copyright and its implications; Database resources; Bibliographic citations and referencing. Development of modern ICT; Hardware technology; Software technology; Input devices; Storage devices; Output devices; Communication and internet services; Word processing skills (typing, etc.).

GST 122: Communication in English II (2 Units: LH 30)

Logical presentation of papers; Phonetics; Instruction on lexis; Art of public speaking and oral communication; Figures of speech; Précis; Report writing.

GST 125: Contemporary Health Issues (2 Units: LH 30)

Diet, exercise and health, nutritional deficiency diseases, malaria, other infections, hypertension, organ failure, air-borne diseases, sexually transmitted diseases, cancer and its prevention, sickle cell disease. HIV/AIDS: Introduction, epidemiology of HIV, natural history of HIV infection, transmission of predisposing factors to HIV, Impact of HIV/AIDS on the society, management of HIV infection, prevention of HIV. Drugs and Society: sources of drugs, classification of drugs, dosage forms and routes of drug administration, adverse drug reactions, drug abuse and misuse, rational drug use and irrational drug use. Human kinetics and health education: personal care and appearance, exercise and health, personality and relationship, health emotions, stress, mood modifiers, refusal to tobacco, alcohol and other psychoactive drugs.

200-Level Courses

GST 211: Environment and Sustainable Development (2 Units: LH 30)

Man – his origin and nature; Man and his cosmic environment; Scientific methodology, Science and technology in the society and service of man. Renewable and non-renewable resources – man and his energy resources. Environmental effects of chemical plastics, Textiles, Wastes and other materials, Chemical and radiochemical hazards, Introduction to the various areas of science and technology. Elements of environmental studies.

GST 222: Peace and Conflict Resolution (2 Units: LH 30)

Basic Concepts in peace studies and conflict resolution; Peace as vehicle of unity and development; Conflict issues; Types of conflict, e. g. Ethnic/religious/political/economic conflicts; Root causes of conflicts and violence in Africa; Indigene/settler phenomenon; Peace – building; Management of conflict and security. Elements of peace studies and conflict resolution; Developing a culture of peace; Peace mediation and peace-keeping; Alternative Dispute Resolution (ADR). Dialogue/arbitration in conflict resolution; Role of international organizations in conflict resolution, e.g. ECOWAS, African Union, United Nations, etc.

GST 223: Introduction to Entrepreneurship (2 Units: LH 30)

Introductory Entrepreneurial skills: Relevant Concepts: Enterprise, Entrepreneur, Entrepreneurship, Business, Innovation, Creativity, Enterprising and Entrepreneurial Attitude and Behaviour. History of Entrepreneurship in Nigeria. Rationale for Entrepreneurship, Creativity and Innovation for Entrepreneurs. Leadership and Entrepreneurial Skills for coping with challenge. Unit Operations and Time Management. Creativity and Innovation for Self-Employment in Nigeria. Overcoming Job Creation Challenges. Opportunities for Entrepreneurship, Forms of Businesses, Staffing, Marketing and the New Enterprise. Feasibility Studies and Starting a New Business. Determining Capital Requirement and Raising Capital. Financial Planning and Management. Legal Issues, Insurance and Environmental Considerations.

GST 224: Leadership Skills (2 Units: LH 30)

Transformation is a fundamental shift in the deep orientation of a person, organization or society such that the world is seen in new ways and new actions and results become possible that were impossible prior to the transformation. Transformation happens at the individual level but must be embedded in collective practices and norms for the transformation to be sustained. Leadership Development Programme (LDP) proposes novel approaches to teaching and learning, which emphasizes the practical involvement of participants. It is interactive and involves exercises and actual implementation of breakthrough projects by teams that make difference in the lives of the target population. In this course, leadership concepts comprising of listening, conversation, emotional intelligence, breakthrough initiatives, gender and leadership, coaching and leadership, enrolment conversation and forming and leading teams will be taught.

GST 311: Entrepreneurship (2 Units: LH 30)

Profiles of business ventures in the various business sectors such as: Soap/Detergent, Tooth brush and Tooth paste making; Photography; Brick making; Rope making; Brewing; Glassware production/ Ceramic production, Paper production; Water treatment/conditioning/packaging; Food processing/preservation/packaging; Metal fabrication; Tanning industry; Vegetable oil extraction; Farming; Fisheries/aquaculture;

Please, forward your comment on any section of this document to the following email:
nucassessment@gmail.com
You can also call the following phone numbers: 08033145087, 08033201097
All comments should be received before 31st October, 2015

Plastic making; Refrigeration/Air-conditioning; Carving, Weaving; Bakery; Tailoring; Printing; Carpentry; Interior Decoration; Animal husbandry etc. Case Study Methodology applied to the development and administration of Cases that bring out key issues of business environment, start-up, pains and gains of growth of businesses, etc. with particular reference to Nigerian businesses. Experience sharing by business actors in the economy with students during Case presentations.

DRAFT

SECTION THREE:

COURSE STRUCTURE AND SYNOPSES OF ENVIRONMENTAL SCIENCE DEGREE PROGRAMMES

Section 3 contains the structure and the synopses of courses prescribed for each programme in the discipline. The courses are mainly at the levels 200 to 500. In this section, compulsory courses (C), required courses (R) and electives (E) have been identified. Similarly, the minimum number of lecture hours (LH) and Practical hours (PH) recommended for each course have been indicated in the different tables of courses at different levels.

3.1 ARCHITECTURE DEGREE PROGRAMME

3.1.1 Introduction

A two-tier degree structure has been in operation in Nigerian Universities for the last two decades. The first-tier leads to the award of a non-professional Bachelor's degree in architecture, while the second-tier leads to the professional master's degree. This statement provides a guide for the Bachelor's degree programme. The Master's degree is recognized as post-graduate programme. The minimum standards for the postgraduate Masters' programmes in architecture are to be guided by the various institutions' minimum academic standards for post-graduate studies as well as the threshold standards for professional assessment. Architecture is an interdisciplinary field that comprises several fields including human and physical sciences. A graduate of architecture is trained in the art and science of planning, design, erection, commissioning, maintenance, management and co-ordination of allied professional inputs in the sustainable development of the built environment. Architecture seeks to accommodate all human activities in all places and under varied conditions with a full understanding of the of the different physical There should be flexibility in the development of courses to allow for the changing needs of architectural education arising from changing social, economic, psychological and technological environment.

The overall national purposes in Architectural education can be stated in general terms as follows:

- To produce competent, creative, skilled and versatile individuals capable of facing a broad spectrum of challenges associated with the design and construction of spaces for humans and activities;
- To produce public spirited persons that are intellectually mature, socially responsible and environmentally sensitive.

Every institution should in addition aim at exploring the rich cultural and traditional architectural resources in the country in general and within its immediate environment in particular.

3.1.2 Aims and Objectives

The primary aim of architectural education is to produce competent, creative, intellectually mature, ethical, socially responsible professional designers/builders.

An Architectural Education programme should be committed to:

- a) Offering a high-quality of professional education aimed at establishing core principles and fundamental architectural knowledge, an awareness of, and aptitude to design, coordinate and carry out projects;
- b) Equipping the student with advanced comprehension of the environmental, social, economic and technological contexts underlying design and construction in the built environment;
- c) Inculcating in the students adequate knowledge, attitudes, specialised skills and character qualities that will upon their graduation enable them effectively integrate knowledge of allied professions, co-ordinate and control the design and construction processes;
- d) Creating enabling environments that will foster active interest in research and development in architecture and related fields
- e) Provide the student with entrepreneurial knowledge and skills to enable him/her to be self-reliant.

3.1.3 Programme Duration

Schools of architecture shall offer a two-tier degree programme. The minimum recommended duration of the first-tier is eight (8) academic semesters. The first tier programme leads to the award of a bachelor's degree in architecture. A students' Industrial Training programme of six months duration shall be incorporated in the programme without prejudice to the minimum academic semesters recommended above.

The second-tier of Four (4) academic semester's duration leads to a professional Master degree.

3.1.4 Admission Requirements

Admission into the Architectural programmes may be through any of the following modes:

UTME Admission: Candidates who have successfully completed the Senior Secondary School or its equivalent and obtained five credit level passes in Mathematics, English Language, Physics and two other subjects from the following list will be eligible for admission currently through the Unified Tertiary Matriculation Examinations (UTME); Chemistry, Biology, Technical Drawing, Fine Arts, Geography, Economics, Building Construction and Land Surveying.

Direct Entry Admission: Candidates who fulfil the requirements above and who have obtained G.C.E. Advanced level, H.S.C/IJMB or equivalent passes in Mathematics and Physics, or Mathematics or Physics and any other subject noted above may or candidates who hold Higher National Diploma (HND) in relevant field may be admitted into the 200 - level of the programme.

3.1.5 Graduation Requirements

Total minimum credit required for graduation is 144 and 120 for students admitted through UTME and Direct Entry admissions respectively. In order to graduate, a student must pass all compulsory and required courses.

3.1.6 Learning Outcomes

Graduates from architecture schools would be expected to have enhanced understanding of the environmental problems of the host community and be routinely able to evolve architectural solutions to these problems. In addition they should demonstrate the attributes listed below:

- 1) Ability to analyse environmental and social development problems, blend the various elements and provide appropriate architectural design solutions that satisfy both technical and aesthetic requirements
- 2) Adequate understanding of the needs of the society, the client and building users as well as the skills to resolve these needs in design projects.
- 3) Adequate knowledge of human sciences, fine arts, technologies and related theories that influence the quality of architectural design
- 4) Skills to produce appropriate and imaginative architectural design solutions that are structurally sound, technologically apt, economically feasible, and environmentally friendly
- 5) Adequate knowledge of the profession of architecture and the role of the architect in the building industry and society
- 6) Adequate knowledge of regulations and procedures, industries and groups involved in the processes of transforming designs into buildings within existing or new planning regimes.
- 7) Understanding of the relationship between buildings and the environment and skills to mitigate and adapt buildings to the impacts of changes in the environment.
- 8) Necessary skills to effectively communicate design ideas to all stakeholders as well as manage information flow and communications during the post design stages
- 9) The ability to integrate and co-ordinate the inputs of other professionals in the building team to achieve the objectives of the project(s).

3.1.7 Instructional Modules

Eight basic instructional modules have been identified as critical to functional architectural education. These are listed below. Even though each School of Architecture is encouraged to adapt its course contents, nature and organisation of its courses or modules to reflect its own peculiar characteristic, it is however expected that all programmes will offer instructions in the areas listed below:

- A. Architectural Design
- B. Communication
- C. History and Theoretical Studies
- D. Technical Studies
- E. Arts and Humanities
- F. Environmental studies
- G. Physical Sciences and Information Technology
- H. Management, Entrepreneurial and Professional Studies.

Instructional Module Capabilities

The minimum levels of knowledge, understanding and skills the modules are expected to inculcate in the students are enumerated below.

Module A: Architectural design

- To develop the skills and techniques in information gathering, problem definition, analysis, evaluation and problem solving through architectural design
- Develop ability to engage imagination, think creatively, innovate and provide design leadership for schemes of varying magnitude that involve other professionals
- Develop ability to integrate technical, social, environmental, aesthetic, as well as financial knowledge for creative architectural design solutions during these exercises
- Develop ability to think three dimensionally in the development of design

Module B: Communication

- To provide the Architecture student with the experience and skills in effective visual communication using manual and electronic graphic modelling tools.
- To develop imaginative and creative faculties of the student so as to gain confidence in working processes requiring Communication skills.

Module C: History and Theoretical studies

- To offer knowledge and understanding of the history and theory of Architecture
- To introduce knowledge of architectural design precedents as well as awareness and skills in architectural criticism.
- To develop the understanding of design processes and procedures

Module D: Technical

- To develop the knowledge and understanding of contemporary and traditional building structures, materials and construction.
- To develop the skills to act with innovation and technical competence in resolving architectural, landscape and urban design issues
- To create understanding of processes and the integration of structural construction technologies and service systems in the built environment

Module E: Arts and Humanities

- To provide knowledge and understanding of the general cultural, historical, psychological and sociological contexts within which architecture is created.
- To offer clarification and skills to assess the implications of design decisions on the users, the client and wider society.
- To expose the students to the legal, political and economic frameworks within which he is expected to operate as an architect.

Module F: Environmental Studies

- To create awareness of the relationship between man and the natural, physical and built environment.

- To expose the student to environmental control services such as heating, cooling, ventilation, fire services, acoustic, plumbing and drainage, electrical, lighting, vertical transport systems, security systems, etc.
- To enable the students act with knowledge of environmental impacts of human activities including issues like pollution, waste management, conservation and environmental/ecological sustainability.
- To create an awareness and advanced knowledge of building integrated renewable energy and resource management systems.

Module G: Physical Sciences and Information Technology

- To master the basic techniques, skills and principles of Physical Sciences as it relates to the building industry.
- To acquire the knowledge and skills in Information Technology and effective use of computers in the building industry.
- To acquire proficiency in digital graphical communication including modelling and evaluation, word & data processing and use of the Internet.

Module H: Management, Entrepreneurial and Professional Studies

- To equip the student with management tools required for the co-ordination, control, administration and management of projects.
- To develop knowledge of the legal, professional, business and financial contexts of architectural practice.
- To develop an awareness and understanding of professional ethics and codes of conduct for architectural practice.
- To create an understanding of business principles and equip students with entrepreneurship skills to be resourceful and self-reliant.
- To develop an understanding of implementation, cost implication, managerial, as well as various processes that go into realising an architect's concept.
- The Student Industrial Work Experience Scheme (SIWES) is to expose the student to:

Competence in the execution of practical Architectural projects, Skills for observation, recording and documentation of construction processes; Knowledge of Health and Safety issues on construction sites; Experience of real-life architectural office practice.

3.1.8 Resource Requirements for teaching and learning Personnel

a) Academic Staff

The qualification and experience of lecturers is an essential element of the quality of architectural education. In order for lecturers in architecture to guide the students towards quality education, it is necessary for lecturers to have close contact with professional practice. The recommended minimum academic staff-student ratio is 1:15. The academic staff should be made up of:

- Lecturer II
- Lecturer I
- Senior Lecturer
- Reader/Associate Professor
- Professor

The point of entry for each of the positions shall reflect academic qualification, teaching experience and practical professional experience as detailed in the general benchmark statement for environmental studies.

In addition to the regular academic staff, Schools of Architecture should be able to benefit from the wealth of experience and expertise of practicing architects.

b) **Technical Support Staff**

Senior Technical Staff

Considering the technological bias of Architectural education, availability of adequate Technical Staff is crucial. The specialisation of the technical staff may vary depending on the situation of the particular school. Schools that exist within institutions or faculties where technical staff from Building Departments, Engineering and Physics Department can make input, need not recruit technical staff in all specialisation required in Architectural programmes. Requisite specialisation include modelling, Reprographics, Architectural Technology, Laboratory Technology, Architectural illustration, Electrical installation, Building Technology and Plumbing.

3.1.9 **Courses for Architecture Programmes**

Tables 3.2 – 3.7 show the typical distribution of courses for each year of study in the architecture degree programme.

Courses at 100 level Architecture

100-LEVEL ARCHITECTURE					
Course Code	Course Title	Units	Status	LH	PH
ARC 111	Introduction to Architecture I	2	C	30	-
ARC 113	Architectural modelling	2	E	-	90
ARC 121	Architectural Graphics I	2	C	-	90
ARC 123	Freehand Drawing I	2	C	-	90
ARC 131	History of Arts	2	C	30	-
ARC 161	Introduction to Environmental Sciences	2	C	30	-
GST 111	Communication in English I	2	C	30	-
GST 113	Nigerian Peoples and culture	2	R	30	-
MTH 101	General Mathematics I	3	C	45	-
GST 121	Use of Library, study skills & Information and Communications Technology (ICT)	2	R	30	-
GST 125	Contemporary Health Issues	2	R	30	-
PHY111	General Physics I	3	C	45	-
ARC 112	Introduction to Architecture II	2	C	30	-
ARC 122	Architectural Graphics II	2	C	-	90
ARC 124	Freehand Drawing II	2	C	-	90
ARC 162	Planning the Built Environment	2	C	30	-
SOC 112	Introduction to anthropology	2	E	30	-
GST 122	Communication in English II	2	C	30	-

GST 112	Logic, Philosophy and Human existence	2	R	30	-
MTH 102	General Mathematics II	3	C	30	-
PHY117	Experimental Physics	2	C	-	90
	Total	45			

Courses at 200 level Architecture

200-LEVEL ARCHITECTURE					
Course Code	Course Title	Units	Status	LH	PH
ARC 211	Architectural design studio I	4	C	-	180
ARC 221	Descriptive geometry I	2	C	15	45
ARC 231	History of Architecture I	2	C	30	-
ARC 241	Building Components and Methods I	2	C	30	-
ARC 243	Building Structures I	2	C	30	-
ARC 261	Building Climatology	2	C	30	-
GST 223	Introduction to Entrepreneurship	2	C	30	-
CSC 101	Introduction of Computer Science	3	R	30	45
ARC 212	Architectural design studio II	4	C	-	180
ARC 222	Descriptive geometry II	2	C	15	45
ARC 232	History of Architecture II	2	C	30	-
ARC 242	Building Components and Methods II	2	C	30	-
ARC 244	Building Structures II	2	C	30	-
ARC 262	Land Surveying for architects	2	C	15	45
GST 211	Environment and Sustainable Development	2	C	30	-
GST 222	Peace studies and conflict resolution	2	C	30	-
GST 224	Leadership Skills	2	R	30	-
URP 102	Introduction to Planning	2	E	30	-
URP 207	Site Planning	2	E	15	45
	Total	37			

Courses at 300 level Architecture

300-LEVEL ARCHITECTURE					
Course Code	Course Title	Units	Status	LH	PH
ARC 311	Architectural design studio III	4	C	-	180
ARC 313	Urban design	2	C	30	-
ARC 331	Theory of Architecture	2	R	30	-
ARC 341	Building Components and Methods III	2	R	30	-
ARC 343	Building Structures III	2	C	30	-
ARC 363	Building Services I	2	C	30	-
CSC 201	Computer programming	3	R	15	90
ARC 312	Architectural design studio IV	4	C	-	180
ARC 314	Landscape design	2	C	15	45
ARC 316	Interior design	2	C	15	45
ARC 342	Building Components and Methods IV	2	C	30	-
ARC 344	Building Structures IV	2	C	30	-

ARC 352	Research methods in Architecture	2	C	30	-
ARC 361	Environmental design	2	C	30	-
ARC 364	Building Services II	2	C	30	-
GST 311	Entrepreneurship	2	R	30	-
CIL 201	Law of Contract I	3	R	45	-
ARC 382	Students' Industrial Work Experience Scheme (SIWES)	4	C	24 weeks	
	Total	44			

Courses at 400 level Architecture

400-LEVEL ARCHITECTURE					
Course Code	Title	Units	Status	LH	PH
ARC 411	Architectural design studio V	4	C	-	180
ARC 431	Rural Development and Planning	2	C	30	-
ARC 441	Building Components and Methods V	2	R	30	-
ARC 443	Building Structures V	2	C	30	-
ARC 481	Quantities and Estimating	2	C	30	-
ARC 483	Building Economics	2	C	30	-
ARC 461	Building climatology	2	R	30	-
ARC 463	Acoustics and Noise Control	2	R	30	-
ARC 462	Water Supply and Drainage	2	R	30	-
ARC 452	History and Theory dissertation	6	C	-	270
ARC 412	Architectural design studio VI	4	C	-	180
ARC 432	Public and Institutional Buildings	2	C	30	-
ARC 442	Building Components and Methods VI	2	C	30	-
ARC 444	Building Structures VI	2	C	30	-
ARC 482	Building Contract and Arbitration	2	R	30	-
ARC 484	Traditional Buildings	2	R	30	-
ARC 485	Elements of Estate Management	2	R	30	-
	Total	42			

Courses at 500 level Master of Science Architecture

500-LEVEL ARCHITECTURE					
Course Code	Title	Units	Status	LH	PH
ARC 511	Architectural design studio VII	5	C	-	225
ARC 541	Advanced Building Construction	2	C	30	-
ARC 543	Advanced Building Structures	2	C	30	-
ARC 561	Advanced Building Services and Environmental control I	2	C	30	-
ARC 581	Professional Practice and Ethics I	2	C	30	-
ARC 583	Quantities & cost planning	2	C	30	-
ARC 531	Housing studies	2	E	30	-
ARC 513	Landscape design	2	E	15	45
ARC 521	Photography	2	E	15	45
ARC 555	Facilities management	2	E	30	-
ARC 563	Environmental Resource Management	2	E	30	-

ARC 512	Architectural design studio VIII	5	C	-	225
ARC 532	Advanced Research methods	2	C	30	-
ARC 544	Specification writing	2	C	15	45
ARC 562	Advanced building Services and Environmental control II	2	C	30	-
ARC 582	Professional Practice and Ethics II	2	C	30	-
ARC 532	Urban design	2	E	15	45
ARC 514	Interior design	2	E	15	45
ARC 551	Industrial arts	2	E	15	45
ARC 584	Construction management	2	E	30	-
	Total	46			

Courses at 600 level Master of Science Architecture

600-LEVEL ARCHITECTURE					
Course Code	Title	Units	Status	LH	PH
ARC 611	Architectural design studio III	8	C	-	360
ARC 612	Terminal Design Project	12	C	-	540
ARC 614	Design project report	4	C	-	180
	Total	24			

3.1.10 Synopses of Courses in Architecture Degree Programme

ARC 111: Introduction to Architecture (4 Units: LH 30)

This is an introductory course to architecture that emphasizes the architect's role in the building industry. It introduces basic principles of architectural analysis, criticism and aesthetic principles and includes the roles and responsibilities of the design professions; interior design, landscape architecture, urban planning and engineering.

ARC 121: Architectural Graphics and Lettering I (2 Units: PH 45)

This is an introductory studio based course in mechanical drawing, descriptive geometry, perspective/three dimensional drawings, shades and shadows.

ARC 123: Freehand Sketching I (2 Units: PH 60)

Freehand drawing is a studio-based course aimed at building up the students' knowledge and skills in graphic language by means of various media.

ARC 124: Freehand Sketching II (2 Units: PH 60)

This course is a continuation of Freehand Sketching I with emphasis on quick sketching techniques and other media for presentation.

ARC 122: Architectural Graphics and Lettering II (2 Units: PH 60)

This is a continuation course to Architectural Graphics I with emphasis on presentation and rendering techniques, using different media.

ARC 131: History of Arts (2 Units: LH 30)

The course is meant to be a summary of the History of Art and a preamble to History of Architecture. The student will be shown the various influences of major civilization and

how they metamorphosed into styles in art and Architecture. Constant reference where possible should be made to Nigerian art and architecture.

ARC 161: Introduction to Environmental Science (2 Units: LH 30)

The course offers an introduction to energy systems in the atmosphere, biosphere, hydrosphere, and lithosphere. It exposes the students to current environmental issues, including air pollution and other natural hazards; erosion, drought, earthquakes, hurricanes, floods and the principles of sustainability.

ARC 162: Planning the Built Environment (2 Units: LH 30)

The course objective is to provide general knowledge in the larger domain of Environmental Sciences. It will include topics like use of land in cities and regions, land use regulation, regulatory approach compared with real planning, different types of land use: commercial, institutional residential, industrial, recreational etc. This course serves as an introduction to a more specialized study in Landscape and urban Design at higher levels.

SOC 112: Introduction to African Social Anthropology (2 Units: LH 30)

The course offers an introduction to and a survey of human origins and cultural achievements; social anthropology; historical, theoretical and methodological perspectives.

ARC 211: Design studio I (4 units: PH 180)

The course at this level, concentrates on design projects which consolidate student's basic drawing skills, especially their understanding of the fundamental design principles, and produces the concept of form and space. The programme deals with simple constraints like anthropometrics, circulation and imaginative use of form and space to create building for human use.

ARC 212: Design studio II (4 units: PH 180)

A continuation of design studio I with the introduction of very simple design schemes to consolidate the principles learnt in design studio I

ARC 221: Descriptive Geometry I (2 units: LH 15 PH 45)

This is a studio based course involving the use of mechanical drawing aids. The objective of the course is to provide the students with the basic skills and knowledge of communication technique for accurately describing, an object, with use of straight lines and curves.

ARC 222: Descriptive Geometry II (2 units: LH 15 PH 45)

This is a continuation of Descriptive geometry I. It is envisaged that, at the end of both courses, the student will be able to graphically describe buildings of all shapes and forms using different 3 dimensional techniques.

ARC 231: History of Architecture I (2 units: LH 30)

This is a course in architectural history from earliest times to the Romanesque period with emphasis on the forces which shaped the history both in Western as well as in African societies. The course looks at stylistic differences and the social changes associated with them.

ARC 232: History of Architecture II (2 units: LH 30)

This course is intended to create a deep awareness of the rich architectural history of African and in particular Nigerian traditional societies. It is expected that at the end of the course, students will have a greater appreciation of the various styles, planning concepts, forms, construction methods and materials used in traditional African communities.

ARC 241: Building components and methods I (2 units LH: 30)

Building component and methods I is an introductory study of the various parts that make up a building and the diverse methods employed in putting together these components to form the building. Foundations types – piling, raft, isolated foundations. The portal frame construction.

ARC 242: Building components and methods II (2 units LH: 20)

This is a follow on course to Building components and methods I. This course aims to develop a deep awareness of the parts, and the development of technical skills required to translate building design into a physical building structure, i.e. to introduce the student to the building process and construction methods. These courses are pre-requisites to the higher-level similar courses. Construction plants and equipment – cranes, excavators, rollers, power tools, etc.

ARC 243: Building Structures I (2 units: LH 30)

These courses introduce the fundamentals of behaviour of simple structures and strength of materials with emphasis on their application to architectural structures. It aims at equipping the students with sufficient theoretical knowledge and understanding of the behaviour of simple building structures.

ARC 244: Building Structures II (2 units: LH 30)

The course deals with the application of the principles introduced in Building Structures I and concentrates on the application of these principles in the design and assessment of the performance of simply loaded structures including basic rules of thumb for simple structures.

ARC 261: Building Climatology (2 units: LH 30)

Building Climatology deals with the study of the relationship between climate and buildings with emphasis on human health and comfort. It is intended to create enhanced knowledge of various local and global climatic elements and conditions and their effects on the built environment and human comfort. The course will in addition create an awareness of the various design strategies that are appropriate for various climatic conditions/scenarios.

ARC 262: Land Surveying for Architects (2 units: LH 15 PH 45)

This course introduces the students to the basic concepts and techniques of land surveying. It is intended to equip the students with sufficient knowledge and skills to carry out building site operations. The course may include topics like; Linear measurement, chaining over obstacles, levelling, plotting simple section, measurement of horizontal angles in close and open traverses, Triangulation networks, procedure in the field, field record, use of bearing and co-ordinates and the setting out of building and simple road works. The use of dumpy level and theodolite.

CSC 101: Introduction To Computer Science: (3 Units: LH 30 PH 45)

This course is an introduction to the history of Computers. Computer Hardware; functional components Modern input/output units, Software: Operating Systems, Application Packages, Program: Development; Flow charts and algorithms; Program Objects BASIC or VISUAL BASIC Fundamentals.

CIL 201: Law of Contract I (3 Units: LH 45)

Nature of Contract: Sources of Law, concept of bargain, classification. Formation of Contract: Offer and Acceptance, consideration, intention to create legal relations. Contents of Contract: Terms, representations exclusion and limiting terms and fundamental breach of terms. Capacity: Infants, illiterates, corporations, mental patients and drunken persons.

ARC 311, ARC 312: Design studio III & IV (8 units: PH 360)

The course at this level involves more complex design programmes that require the integration and application of knowledge and techniques from various subject domains like structures, materials. The course is also expected to enhance the students' information gathering and analysis skills as well as their ability to translate such information into functional architectural design briefs for multi-functional activity areas.

ARC 313: Urban design (2 units: LH 30)

This course introduces the students to principles, procedures and typologies of urban design. It is largely theory based and provides the students with knowledge and skills to engage in large neighbourhood scale projects.

ARC 314: Landscape design (2 units: LH 15 PH 45)

This is an introduction to the planning and design of residential, project and neighbourhood outdoor spaces. The course is expected to equip

ARC 316: Interior design (2 units: LH 15 PH 45)

The primary aim of this course is to introduce the students to the interior design process. It will develop the students' knowledge of materials, finishes and installations used in interior spaces.

ARC 331: Theory of Architecture (2 Units: LH 30)

This course assists the students in critical evaluation of the works of renowned architects, contemporary architectural thoughts and expression and how these ideas may be synthesized into their own design schemes.

ARC 341 & 342: Building components and methods III & IV (4 units: LH 60)

The course is aimed at enhancing the overall knowledge of the students about modern building materials, their characteristics and application in different parts of a building. It also teaches the students about the operational requirements of different building components. At the end of this course, the student is expected to have a very good knowledge of the range of materials available for use in different parts of the building as well as the understanding to manipulate building components in architectural design.

ARC 343 & 344: Building Structures III & IV (4 units: LH 60)

This is a course aimed at developing a deeper understanding of the behaviour of timber, steel and reinforced concrete in structures. It will also seek to develop the ability of the student to design simple structural elements using these materials as well as the graphic skills in the presentation of design results.

ARC 352: Research methods in Architecture (2 units: LH 30)

Research Methods introduces the student to the range of tools and techniques available for investigation and the conduct of scholastic inquiry into issues relating to architecture with a view to evolving suitable solutions. The course will usually include aspects of statistics that may be of use for data analysis and inferences - averages, means, median, frequencies, ANOVA students T-test, Chi-square, simple and multiple regressions.

ARC 361: Environmental design (2 units: LH 30)

This course focuses on the environmental aspects of architectural design. It is a foundation study that introduces the principles, processes and vocabulary of sustainability into architectural design.

ARC 363: Building Services I (2 units: LH 30)

The course introduces students to the various building services and the principles behind their operations and installation. These will normally include water supply, electricity supply, and sewage and refuse disposal and management.

ARC 364: Building Services II (2 units: LH 30)

This course introduces the students to the principles and application of lighting, ventilation, air conditioning and acoustics in buildings. It will aim to equip the students with sufficient knowledge and skills to integrate these services into architectural schemes.

ARC 382: Students Industrial Work Experience Scheme (4 units: 20 weeks)

ARC 411, 412: Design Studio V & VI (8Units: PH 360)

This is a terminal studio and students develop several highly detailed design proposals, integrating structure, mechanical systems, building envelope, and other major building systems within the framework of well-articulated design intentions.

ARC 431: Rural Development and Planning (2 Units: LH 30)

This course presents the various types of rural communities, their cultural and settlement differences, growth patterns and related issues. The aim is to create an enhance awareness of the different design environment for rural schemes.

ARC 432: Public and Institutional Buildings (2 Units: LH 30)

This course surveys a range of public buildings using site visits, photography, documentation and graphic analysis and examines the design influences, processes and successes.

ARC 441: Building Components and Methods V (2 Units: LH 30)

A lecture based survey on materials and methods of construction as they relate to systems design. The course provides an overview of contemporary building technology and theory. State-of-the-art technology and sustainability are introduced through the use of

high quality contemporary case studies. Fire in buildings – detection, protection fire fighting systems. Designs to withstand fires in buildings.

ARC 442: Building Components and Methods VI (2 Units: LH 30)

Introduction to complex building constructional elements including advanced flooring, roof light, advanced doors and windows, curtain walling, dry walling and building integrated renewable energy systems.

ARC 443, 444: Building Structures V/VI (4 Units: LH 60)

Students analyze more complex systems and design beams and columns in wood, steel, and concrete. Topics include analysis of continuous beams and rigid frames, loads on structural systems, grids & pattern layout and funicular structures (cables and arches).

ARC 452: History and Theory Dissertation (6 Units: PH 270)

This involves the submission of a dissertation of about 15,000 words on a topic of the students' choice under the guidance of a nominated supervisor. The dissertation is normally assessed at the end of the session by both internal and external assessors.

ARC 481: Quantities and Estimating (2 Units: LH 30)

Students learn and apply the basic principles and current practices employed in estimating project costs including unit costs, overhead and profit. Scheduling tools, such as critical path method and bar charts, are examined as an aid and technique in project planning, budgeting and cost control. Estimating for variations and fluctuations, final account procedures.

ARC 483: Building Economics (2 Units: LH 30)

Topics include: practical procedures for building construction estimating of most major trades; analysis of factors and methods affecting construction costs; bid strategies; preparation of preliminary budgets and complete working estimates with quantities and costs of materials, labour and overhead. Computer applications are explored. The building industry and national economy budgeting for public building works.

ARC 482: Building Contract and Arbitration (2 Units: LH 30)

A comprehensive study of construction contracts including conditions of agreement and modifications. The students will also be introduced to related laws of Agency and Tort. A detailed study of the standard form of Building Contracts Forms and types of tenders.

ARC 484: Traditional Buildings (2 Units: LH 30)

As broad study of types of traditional housing in Nigeria, West Africa and Africa. Relating housing settings and structures to climate, local resources, religion, cultures, politics living pattern. The influence of both European housing and culture on traditional African housing types. The study of Nigerian traditional housing types based on geographical, religions and climatic considerations.

ARC 485: Elements of Estate Management (2 Units: LH 30)

An appreciation of the role of estate management professionals in housing and urban development. Feasibility and visibility reports, valuation reports, mortgage, compensation and compulsory acquisition of property. Sales and renting of property.

ARC 511, 512: Architectural Design Studio VII & VIII (10 Units: PH 450)
Students develop highly detailed design proposals, integrating structure, mechanical systems, building envelope, and other major building systems within the framework of well-articulated design intentions.

ARC 532: Advanced Research Methods (2 Units: LH 30)
This course examines the theoretical underpinnings and methodologies pertinent to research in architecture. Students come to understand how researchers conduct architectural research, with the goal of preparing their own thesis agenda. Preparation of abstract, introduction, literature reviews, data analysis and interpretation, referencing styles.

ARC 581: Professional Practice and Ethics I (2 Units: LH 30)
Students gain a detailed understanding of the structure, content, and legal framework of construction documentation through lectures, readings, and the development of selected graphic and written documents. A detailed study of the provisions of ARCON – Architects Registration Council of Nigeria – Professional ethics, discipline etc. The Nigerian Institute of Architects; statutory and social obligations. Calculation of professional fees. Relationships with other professional bodies.

ARC 582: Professional Practice and Ethics II (2 Units: LH 30)
The course involves a comprehensive study of architectural practice, including project management, financial planning, organizational structure, scheduling, marketing, legal issues, and the roles and responsibilities of design professionals.

ARC 541: Advanced Building Construction (2 Units: LH 30)
This course is an introduction to industrialized proprietary building systems for different building types and conditions.

ARC 543: Advanced Building Structures (2 Units: LH 30)
The course is an introduction to the analysis, design and detailing of reinforced concrete, timber and steelwork members including beams, columns and one-way slabs. Strength and serviceability requirements are considered. Stress, loading, moment considerations. Reference to relevant Codes of Practice.

ARC 544: Specification writing (2 Units: LH 30)
Introduction to specification writing covering all important building components e.g. concrete, steel, paint, blockworks etc. with emphasis on the types of specifications and best practice regimes.

ARC 561: Advanced Building Services and Environmental Control I (2 Units: LH 30)
This course will study mechanical, electrical, heating, ventilating, and air conditioning systems, including equipment selection, energy issues, code requirements, environmental conservation, and sustainable design.

ARC 562: Advanced building Services and Environmental Control II

(2 Units: LH 30)

This course will study mechanical, electrical, heating, ventilating, and air conditioning systems, including equipment selection, energy issues, code requirements, environmental conservation, and sustainable design

ARC 583: Quantities & Cost Planning

(2 Units: LH 30)

The fundamentals of construction estimating are covered. Quantity surveys are made for various building components and prices determined for labour and materials, using a current pricing handbook. The uses of price indices

ARC 531: Housing Studies

(2 Units: LH 30)

This course is a survey and analysis of the design and new architecture of urban housing, with focus on urban communities and affordable housing. Topics include social theory, culture of communities, new architectural design precedents, and the implementation of affordable housing to urban communities. Common types of houses boys quarters, 2-,3-, 4-bedroom bungalows, storey buildings.

ARC 532: Urban Design

(2 Units: LH 30)

Using site visits, photography, documentation, and graphic analysis, this course will focus on the interwoven relationship of water, land, architecture, and urban design in Nigeria. Students will experience a city through on-site explorations in the formation of the city, evolving building forms and urban spaces, and the cultural significance of the prevailing architecture.

ARC 514: Interior Design

(2 Units: LH 30)

The course is a historical survey of major design periods in interior architecture and furnishings from antiquity to the late 19th century with emphasis on the artistic, cultural, political, social, economic, and technological conditions which affected their development. Common materials used for interior design, selection criteria – colour aesthetics. Preservation of old interior materials.

ARC 513: Landscape Design

(2 Units: LH 30)

A history and theory of landscape design is coupled with topics on site planning - such as topography, soils, drainage, and planting - to provide an overview of the relationship between building and site design

ARC 521: Photography

(2 Units: LH 30)

An advanced visual presentation course, students will work with various media in photography. Using current and previous design projects, students will learn to visualize their ideas and use photography as a tool for visual communication. The history of photography. Interpretation of satellite images for housing studies - Front, end and plan elevations, oblique and isometric views for photography. The use of video camera for recording, preservation, and documentation of photographs, preparation of photo clips and power-point presentation.

ARC 551: Industrial Arts

(2 Units: LH 30)

Beginning with the Industrial Revolution, the student is made aware of the social, economic, technological and artistic forces, as well as unique individuals that shaped the

evolution of modern design. The uses of glass, ceramic, timber and decorative materials – manufacturing considerations.

ARC 584: Construction Management (2 Units: LH 30)

The course covers construction project management from conception to completion. The course covers feasibility studies, site selection, planning, programming, design coordination, and contracting procedures of actual construction. Emphasis is placed on contractor operations, project administration, job planning, and subcontract coordination

ARC 555: Facilities Management (2 Units: LH 30)

This course examines the scope of the professional facilities manager's position within various practice situations. The FM's role in relation to an organization's strategic plan is stressed. Maintenance and User Manuals, budgeting, administration and management of facilities.

ARC 563: Environmental Resource Management (2 Units: LH 30)

This course introduces the student to the theory and practice of sustainability for the built environment with an emphasis on life-cycle design, materials selection, and resources conservation, Environmental Impact Assessment.

ARC 611: Architectural Design Studio IX (8 Units: PH 360)

This studio addresses topics relevant to the concentration in Built Environment. Students integrate the major Architectural issues emphasized in the previous studios in a single design project.

ARC 612: Terminal Design Project (12 Units: PH 540)

Students pursue a final thesis design of a project of their own definition.

ARC 612: Design Project Report (4 Units: PH 180)

A design project report of the thesis design

3.2 BUILDING DEGREE PROGRAMME

3.2.1 Introduction

The benchmark statements for the Building Programme provide general guidance for articulating the nature and characteristics of the programme but are not a specification of a detailed curriculum in the subject. They allow for diversity and flexibility in the design of programmes and encourage institutions to improve within an agreed overall framework.

Philosophy

The thinking underlying training in Building programme is to develop and advance the Science and practices of building technology and construction management. The Building programme is multi-disciplinary and is concerned with the provision and analysis of information for a variety of decision-making and resource allocation purposes relating to the built environment and improvements of same. It involves courses in building assembly/construction techniques, construction building process in the areas of management, contract management, financial management, building development, redevelopment and maintenance as well as the solution of related multi-faceted problems.

The overall national purpose in Building Technology education is to produce expert with a heightened awareness of health, safety and ethical responsibilities and a set of positive social values that recognize the diverse needs and requirements of various stakeholders in the built environment.

3.2.2 Aims and Objectives of Building programme

The general objectives of a degree programme in building are to train competent graduates in building construction process and its management. In addition, the programme should provide sufficient general knowledge and specified skills/techniques which will enable the professional builder to co-ordinate and control the technological, economic, human and material resources involved in the building process. The specific aims and objectives of the programme are:

- a) To provide a well-balanced theoretical and practical education with the requisite knowledge and skills for effective professional practice.
- b) To enable the student develop his/her intellectual, analytical and critical abilities in order to control the technological, economic, human and material resources involved in the building production process
- c) To equip the students with the ability to locate, extract and analyse data from multiple sources, including drawings and other contract documents
- d) To equip the student with comprehension of the environmental, social, economic and technological contexts underlying design and construction in the built environment;
- e) To inculcate in the students adequate knowledge, attitudes, specialised skills and character qualities that will upon their graduation enable them work effectively within a team in the construction industry
- f) To provide the student with entrepreneurial knowledge and skills to enable him/her to be self-reliant.

3.2.3 Programme Duration

The minimum recommended duration of the building degree programme is ten (10) academic semesters. A students' Industrial Training programme (SIWES) of six months minimum duration shall be incorporated in the programme. This scheme will normally last one full semester and the intervening holiday.

3.2.4 Admission Requirements

Admission into Building Programmes may be through any of the following modes:

UTME Admission: Candidates who have successfully completed the Senior Secondary School or its equivalent and obtained five credits in Mathematics, English Language, Physics and two other subjects from the following list will be eligible for admission currently through the Unified Tertiary Matriculation Examinations (UTME); Building Construction, Land Surveying, Fine Arts, Technical Drawing, Economics, Geography, Chemistry and Biology.

Direct Entry Admission: A candidate who fulfils normal admission requirements above and in addition holds an HSC, GCE Advanced Level IJMB and or a National Diploma (ND) in an appropriate discipline may be admitted into the 200 level of the programme. In addition, holders of Higher National Diploma (HND) in Building, Civil Engineering or similar related qualifications may be placed at appropriate level of study. Any deficiencies in a candidate's background may be rectified by taking appropriate courses.

3.2.5 Graduation Requirements

Total minimum credit required for graduation is 180 and 154 for students admitted through normal and Direct Entry modes respectively. Candidates must pass all the compulsory courses to be awarded an honours degree.

3.2.6 Learning Outcomes

Graduates of Building are expected to demonstrate a wide range of abilities and skills among which are the followings:

- ✓ Building related cognitive abilities and skills
- ✓ Ability to understand the essential facts, concepts, principles and theories relating to the subject areas identified above.
- ✓ Ability to apply the acquired knowledge to solving familiar and unfamiliar qualitative and quantitative problems.
- ✓ Ability to identify and analyse new problems and plan strategies for the solution.
- ✓ Ability to evaluate, synthesize and interpret Building industry information and data using IT.
- ✓ Ability to present orally and in written form, scientific materials, contract documents, detailing and arguments clearly and correctly to the client and other range of audience.

Practical Skills:

- Competence in feasibility and viability studies.
- Competence in building assemblage and construction
- Skills in coordination and management of Building projects
- Skills in the monitoring, control and inspection of different levels of site works.

- Skills in obtaining and analyzing quotations and making recommendations for the purchase of all materials, components and sub-contract works and other construction resources required for building project.
- Skills in the preparation of project Quality Manual, Fire, Health, Safety plan and instructions for building construction.

General Skills

- Written and oral communication skills
- Information technology skills.
- Information retrieval skills in relation to primary and secondary sources including information retrieval through on-line computer search internet, emails
- Inter personal skills - ability to engage in team work.
- Qualitative and qualitative problem solving skills.
- Time – management
- Study skills needed for continuing professional development (CPD)

Graduates exhibit the following specific *attributes*:

- a. Ability to discharge responsibilities to the client or employer with full consideration to the public and Building profession interest.
- b. Ability to uphold the dignity, standing and reputation of the profession in accordance with the code of Professional conduct.
- c. Ability to keep confidential information confidential
- d. Ability to give fair and unbiased advice
- e. Ability to be free from corruption
- f. Ability to use professional skills and integrity acquired for the good of the society
- g. Skills to be abreast with the new thoughts and development in the Building Industry.

3.2.7 Resource Requirements for Teaching and Learning Personnel

a) Technical Support Staff

Considering the technological bias of Building education, availability of adequate Technical Staff is crucial. The specialisation of the technical staff may vary depending on the situation of the particular Department. Departments that exist within institutions or faculties where technical staff from Architecture, Engineering and Physics departments can make input need not recruit technical staff in all specialisation required in Building programmes. The table below is a suggestion of staffing levels for technical support in the Building programme.

Appropriate cadre of Technical Staff should be provided based on the NUC prescribed ratios for the following areas:

- i. Structures Laboratory
- ii. Services Laboratory
- iii. Technical Drawing Room
- iv. Workshops

3.2.8 Instructional Modules

While flexibility is allowed in the depth of the body of knowledge in the Building programme it is essential that all programmes will ensure that students are conversant with the following major aspects of Building:

- A. Building Construction Technology
- B. Building Maintenance Management
- C. Building Services
- D. Building Structures

3.2.9 Courses for Building Programmes

Tables 3.8 – 3.12 show the outline of courses distributed over the ten semesters of studies indicating all compulsory and required courses. It would be observed that some of these courses may not be taught in a department of building particularly if a composite faculty structure is adopted by a university.

Courses at 100 level Building

100-LEVEL BUILDING					
Course Code	Title	Units	Status	LH	PH
BUD 101	Introduction to Building I	2	C	30	-
BUD 141	Principles of Economics for Builders	2	C	30	-
EMT 103	Introduction to Environmental Sciences	2	C	30	-
MTH 101	General Mathematics I	3	R	45	-
GST 111	Communication in English I	2	C	30	-
GST 113	Nigerian Peoples and culture	2	R	30	-
GST 121	Use of Library, study skills & Information and Communications Technology (ICT)	2	R	30	-
PHY 111	General Physics I	3	C	45	-
GEO 161	Introduction to land use planning	2	E	30	-
ARC 162	Planning the built environment	2	E	30	-
BUD 102	Introduction to Building II	2	C	30	-
BUD 104	Techniques of drawing and design	2	C	-	90
BUD 122	Building Construction and Material I	2	C	30	-
BUD 171	Introduction to Estimating	2	C	30	-
GST 122	Communication in English II	2	C	30	-
GST 112	Logic, Philosophy and Human existence	2	C	30	-
PHY 102	General Physics II	3	R	45	-
BUD 114	Communication Skills	2	E		
GEO 103	Introduction to human Geography	2	E	30	-
PHY 117	Experimental Physics	2	R	-	90
	Total	43			

Courses at 200 level Building

200-LEVEL BUILDING					
Course Code	Title	Units	Status	LH	PH
BUD 201	Building & Architectural Science	2	C	30	-
BUD 211	Structural Theory and Design I	3	C	45	-
BUD 221	Building Construction & Materials II	3	C	30	45
BUD 251	Computer Aided Design	2	C	15	45
BUD 261	Land Surveying I	2	C	15	45
BUD 291	Workshop Practice	2	C	-	90
QTS 101	Introduction to Quantity Surveying	2	C	30	-
BUD 271	Principles of Measurements & Description I	2	C	15	45
GST 223	Introduction to Entrepreneurship	2	R	30	-
Arc 161	Introduction to Environmental Science	2	E	30	-
STA 203	Statistics for physical sciences and engineering	4	E	60	-
GST 211	Environment and Sustainable Development	2	R	30	-
BUD 222	Building Construction and Materials III	3	C	30	45
BUD 212	Structural Theory and Design II	3	C	45	-
BUD 272	Principles of Measurement and Description II	2	C	15	45
BUD 262	Land Surveying II	2	C	-	90
BUD 282	Soil Mechanics and Foundation I	2	C	15	45
	Basic Elements of Planning	2	R	30	-
GST 222	Peace studies and conflict resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
	Total	46			

Courses at 300 level Building

300-LEVEL BUILDING					
Course Code	Title	Units	Status	LH	PH
BUD321	Construction Technology I	3	C	45	-
BUD331	Building Maintenance I	2	C	30	-
BUD341	Building Services and Equipment I	2	C	15	45
BUD311	Structural Analysis	3	C	45	-
BUD333	Engineering Thermodynamics	2	R	30	-
BUD361	Building Material Science	2	C	15	45
BUD371	Introduction to Project Management	2	C	30	-
BUD381	Soil Mechanics and Foundations II	2	C	15	45
BUD391	Research Methods	2	R	30	-
BUD351	Case Studies on Glass in Building	2	E	30	-
BUD353	Clay and Clays Products	2	E	30	-
BUD 312	Reinforced Concrete Structure	3	C	30	45
BUD322	Construction Technology II	2	C	30	-

300-LEVEL BUILDING					
BUD332	Building Maintenance II	2	C	15	45
BUD342	Building Services and Equipment II	2	C	15	45
BUD372	Project Planning and Control	3	C	45	-
BUD374	Building Contracts Law & Arbitration	2	C	30	-
BUD376	Building Regulations, Laws and Control	2	C	30	-
BUD382	Soil Mechanics and Foundations III	2	C	15	45
BUD352	Timber Structures	2	E	30	-
ARC314	Principles of Landscape design	2	E	30	-
GST 311	Entrepreneurship	2	R	30	-
	TOTAL	48			

Students are expected to take a minimum of 2 Units of electives each semester from the list that may be introduced by the particular programme.

Courses at 400 level Building

400-LEVEL BUILDING					
Course code	Title	Units	Status	LH	PH
BUD 411	Reinforced Concrete Design I	3	C	45	-
BUD 471	Building Economics and cost planning	2	C	30	-
BUD 431	Construction Plant & Equipment	2	C	30	-
BUD 473	Principles of Construction Management	3	C	45	-
BUD 491	Operations Research	2	C	30	-
BUD 441	Building Services and Equipment III	2	C	30	-
BUD 451	Production Management	2	C	30	-
BUD 453	Sociology of Housing	2	E	30	-
BUD 455	Business Organization and Accounts	2	E	30	-
BUD 457	Rural Development Planning and Basic Infrastructure	2	E	30	-
BUD 402	SIWES	18	C	24 weeks	
	TOTAL	40			

Students are expected to take a minimum of 4 Units of electives in the first semester from a list that may be introduced by the particular programme.

Courses at 500 level Building

500-LEVEL BUILDING					
Course Code	Title	Units	Status	LH	PH
BUD 511	Reinforced Concrete design II	3	C	45	-
BUD 521	Advanced Construction Technology I	2	C	15	45
BUD 561	Integrated Studio work	2	C	-	90
BUD 563	Specification writing I	2	C	30	-
BUD 571	Project Management I	2	C	30	-
BUD 573	Professional Practice and Ethics	2	R	30	-
BUD 591	Project Reports I	3	C	-	-
BUD 551	Budgeting and Finance	2	E	30	-
BUD 553	Bidding Tendering and strategies	2	E	30	-
BUD 555	Any one elective in the Structures Option	2	E	30	-
BUD 512	Design of Steel Structure	2	C	30	-
BUD 522	Advance Construction Technology II	2	C	30	-
BUD 564	Specification writing II	2	C	30	-
BUD 572	Project Management II	2	C	30	-
BUD 574	Environmental Impact Assessment	2	R	30	-
BUD 592	Project report II	3	C	-	-
BUD 552	Geographic Information System (GIS)	2	E	30	-
BUD 554	Construction Plant and Equipment	2	E	30	-
BUD 556	Any one Elective in Building Maintenance Option	2	E	30	-
	TOTAL	41			

Students are expected to take a minimum of 4 Units of electives in each semester from a list that may be introduced by the particular programme.

3.2.10 Synopses of Courses in Building Degree Programme**BUD 101: Introduction to Building I (2 Units: LH 30)**

The course offers an overview of the building construction process, the building industry and highlights the role of different stakeholders in the construction industry. Simple foundation, walls, windows/doors/roof finishing, services.

BUD 141: Principles of Economics for Builders (2 Units: LH 30)

An introduction to economics, its scope methodology and relationship to the building/construction industry. Supply and demand considerations, electricity, GDP, the Nigerian financial system, money and banking regulations.

EMT 103: Introduction to Environmental Science (2 Units: LH 30)

The course offers an introduction to energy systems in the atmosphere, biosphere, hydrosphere, and lithosphere. It exposes the students to current environmental issues, including air pollution and other natural hazards; erosion, drought, earthquakes, hurricanes, floods and the principles of sustainability.

GEO 161: Introduction to Land Use Planning (2 Units: LH 30)

An overview of the basic theories and models of urban and rural land use planning. Topics to be treated may include morphology of towns, cities and rural areas (including in Nigeria) as well as the planning process.

BUD 102: Introduction to Building II (2 Units: LH 30)

This course offers a general description of the components of buildings, their characteristics and an overview of the operations and materials presently in use in the construction industry. Emphasis is placed on understanding common practices, materials, nomenclature, and interpretation of construction documents and plans

BUD 104: Techniques of Drawing and Design (2 Units: PH 90)

An introduction to and interpretation of architectural, civil, structural, and electrical drawings, freehand sketching of construction details and sections; manual construction drafting. Development of simple surfaces, plotting loci, involute and ellipse.

BUD 122: Building Construction and Materials I (2 Units: LH 30)

Survey of current materials and methods used in building construction, including building foundations; timber, concrete and steel framing systems; masonry construction; interior and exterior finishes.

BUD 171: Introduction to Estimating (2 Units: LH 30)

Students are introduced to the basic concepts, principles and current practices employed in estimating project costs including unit costs, overhead and profit.

BUD 114: Communication Skills (2 Units: PH 90)

This is a complimentary course to Techniques of drawing and design that aims to further develop the students' freehand drawing skills, lettering, as well as introduction of professional report writing.

ARC 162: Planning the Built Environment (2 Units: LH 30)

The course objective is to provide general knowledge in the larger domain of Environmental Sciences. It will include topics like use of land in cities and regions, land use regulation, regulatory approach compared with real planning, different types of land use: commercial, institutional residential, industrial, recreational etc. This course serves as an introduction to a more specialized study in Landscape and urban Design at higher levels.

GEO 103: Introduction to Human Geography (2 Units: LH 30)

This course is an introduction to the scope of human geography and its relation to physical geography. The course looks at World population, its distribution and patterns of growth/demographic characteristics of selected populations as well as human settlements: evolution; patterns and functions. Students are introduced to environmental resources; the concept of resources: types of resources and their global distribution; relationship between resources and tertiary activities; impact of human activities on the environment at varying levels of technology and population densities. The role of movement; flows of people, goods, energy and ideas

BUD 201: Building & Architectural Science (2 Units: LH 30)

This is an introduction to building physics and will aim to familiarize the students with issues of thermal comfort, lighting, acoustics, heat transfer in Buildings

BUD 211: Structural Theory and Design I (3 Units: LH 45)

Students are introduced to the definitions and concepts of building structures. It will normally include development of the techniques used in analyzing, selecting, and designing statically determinate structural building elements including footings, retaining walls, slab systems, beams, columns, rigid frames, arches and trusses, and other types of walls.

BUD 221: Building Construction & Materials II (3 Units: LH 30 PH 45)

A detailed study of current methods and equipment used in timber, glass, masonry and steel construction for beams, columns, slabs, roof structure composite materials considerations.

BUD 261: Land Surveying I (2 Units: PH90)

This course will introduce the student to the various methods and applications of land surveying to the building construction industry. Students will be introduced to the various technologies employed by Professional Land Surveyors in accomplishing their work including levelling, distance measurement, data collection, computer-aided design (CAD), the global positioning system (GPS) and geographical and land information systems (GIS/LIS)

BUD 291: Workshop Practice (2 Units: LH: 15 PH 45)

This is a lab based study that introduces students to safety regulations and practices in workshops. Noise, fire escape and protection, fire fighting, general security. User-manual systems for instruments and tools.

QTS 101: Introduction to Quantity Surveying (2 Units: LH 30)

Students learn and apply the basic principles and current practices employed in estimating project costs including unit costs, overhead and profit. Scheduling tools, such as critical path method and bar charts, are examined as an aid and technique in project planning, budgeting and cost control.

BUD 271: Principles of Measurements & Description I (2 Units: LH 30)

This course is an introduction into the mechanics of measuring building works, functions of bills of quantities. Principles of Measurement, Taking-off, Abstracting and Building

BUD 221: Building Construction and Materials III (3 Units: LH 30 PH 45)

This course involves a more detailed study of materials and their performance in construction. It will seek to increase the students' knowledge of the processing of different building materials, current bye-laws, issues of materials specification, builders tools and equipment

BUD 212: Structural Theory and Design II (3 Units: LH 45)

Introduction to building structural design concepts, principles and techniques

QTS 272: Principles of Measurement and Description II (2 Units: LH 15 PH 45)

The fundamentals of construction estimating are covered. Quantity surveys are made for various building components and prices determined for labour and materials, using a current pricing handbook. Standard estimators' forms are prepared. Computer techniques and applications are also examined

BUD 262: Land Surveying II (2 Units: PH 90)

This is hands-on course involving the application of different techniques and technologies in land surveying. The uses of common instruments e.g. the quickset, theodolite, plotting of field survey data.

BUD 282: Soil Mechanics and Foundation I (2 Units: LH 15, PH 45)

This course is an introduction to the basic principles of soil mechanics and their application to the solutions of problems in earthwork and foundation engineering. Soil moisture content, California Bearing Rating – liquid and plastic limit.

URP : Basic Elements of Planning (2 Units: LH 30)

Students are introduced to the basic elements of planning including definitions, evolution, principles and theories of planning at different scales.

BUD 251: Computer Aided Design (2 Units: PH 90)

This is an introductory course in the use of computer-aided-design and drafting techniques utilizing AUTOCAD® software. It will include instruction on the use of various commands and functions.

ARC 161: Introduction to Environmental Science (2 Units: LH 30)

The course offers an introduction to energy systems in the atmosphere, biosphere, hydrosphere, and lithosphere. It exposes the students to current environmental issues, including air pollution and other natural hazards; erosion, drought, earthquakes, hurricanes, floods and the principles of sustainability

STA 203: Statistics for Physical Sciences and Engineering (4 Units: LH 60)

Scope for statistical methods in physical sciences and engineering. Measures of location, partition and dispersion. Elements of probability. Probability distribution: binomial, Poisson, geometric, hypergeometric, negative-binomial, normal. Estimation (Point and interval) and tests of hypotheses concerning population means proportions and variances. Regression and correlation. Non-parametric tests. Contingency table analysis. Introduction to design of experiments. Analysis of variance.

BUD 321: Construction Technology I (3 Units: LH 45)

The course presents a detailed study of current methods and equipment used in building domestic and small scale, simple construction projects. Studies of strip and raft foundation, walls in blockwork and brickwork, plain and reinforced concrete floors, pitched roof in timber and steel, purlins, roof covering, ceiling, finishings to walls, floors and ceiling, setting out buildings.

BUD 331: Building Maintenance I (2 Units: LH 30)

This course will introduce students to the principles, theories and practices in building maintenance management. It may cover topics like building condition assessment, remediation actions, and maintenance types.

BUD 341: Building Services and Equipment I (2 Units: LH: 15 PH: 45)

Topics include the basic design principles and code requirements of plumbing and drainage systems; heating, ventilating and air-conditioning to control temperature, humidity and indoor air quality; heat and cooling calculations; and fire-protection systems.

BUD 311: Structural Analysis (3 Units: LH 45)

Fundamentals of static equilibrium are applied to the analysis of beams, trusses, and frames. Free bodies, shear and moment diagrams, and sectional area properties are covered

BUD 333: Engineering Thermodynamics (2 Units: LH 30)

Topics to be treated include: Definition of essential terms, general concepts and Laws of Thermodynamics especially with respect to building services and systems.

BUD 361: Building Material Science (2 Units: LH 30 PH 45)

This is a combination of theory and lab work dealing with the properties of common building materials and how they may be tested. Aggregate, concrete, asphalt, wood, and masonry are tested using standard procedures to establish design criteria, inspection and quality control programs.

BUD 371: Introduction to Project Management (2 Units: LH 30)

Covers feasibility studies, site selection, planning, programming, risk allocation, client relationships, project reporting, design coordination, and contracting procedures

BUD 381: Soil Mechanics and Foundations II (2 Units: LH 15 PH 45)

Study of the characteristics and behaviour of soil as it relates to the design and construction of buildings. Topics include compaction, seepage, subsurface stress, shear strength and settlement. Lab sessions are devoted to testing soil samples for relevant properties

BUD 391: Research Methods (2 Units: LH 30)

Introduction to research methods

BUD 354: Case studies on Glass in Buildings (2 Units: LH 30)

The course is an introduction to Glass technology and manufacture and the use of glass in buildings. It is case studies based course requiring active participation of the students in sourcing and documenting information.

BUD 353: Clays and Clay Products (2 Units: LH 30)

This course covers the properties of clay and timber products used in construction. The basic design principles for timber and steel structures are covered including connections, beams, columns, trusses, and frames

BUD 322: Construction Technology II (2 Units: LH 30)

A follow on course to BUD 321 dealing with larger and more complex buildings

BUD 332: Building Maintenance II (2 Units: LH 15 PH 45)

The course builds on the foundations of BUD 331 and discusses maintenance budgets, service level agreements and asset management.

BUD 342: Building Services and Equipment II (2 Units: LH 15 PH 45)

The course examines the basic building services, including heating, water, plumbing, drainage, ventilation, air-conditioning, vertical transportation, acoustical control, electrical controls, and associated building code requirements.

BUD 312: Reinforced concrete structures (3 Units: LH 30 PH 45)

Topics include the design principles for reinforced concrete structures covering beams, columns, slabs, footings and retaining walls

BUD 372: Project Planning and Control (3 Units: LH 45)

The course introduces common scheduling tools, including critical path method and bar charts as an aid in project planning, budgeting, and cost control. Also introduces the gathering, processing, and evaluation of project information for effective project control.

BUD 382: Soil Mechanics and Foundations III (2 Units: LH 15 PH 45)

This course is a continuation of the earlier course BUD 381.

BUD 352: Timber Structures (2 Units: LH 30)

This course covers the properties of wood and timber products used in construction. The basic design principles for timber and steel structures are covered including connections, beams, columns, trusses, and frames

BUD 374: Building Contracts, Laws and Arbitration (2 Units: LH 30)

A comprehensive study of construction contracts including conditions of agreement and modifications. The students will also be introduced to related laws of Agency and Tort.

BUD 376: Building Regulations, Laws and Control (2 Units: LH 30)

This is a course that aims to familiarize the Students with the Nigerian Building Code as it applies to buildings. Emphasis will be laid on the performance specifications of different building elements.

ARC 314: Principles of Landscape Design (2 Units: LH 30)

This is an introduction to the planning and design of residential, project and neighbourhood outdoor spaces. This studio based course is expected to equip the students with general knowledge and skills to design and manage small scale landscaping projects

BUD 411: Reinforced Concrete Design I (3 Units: LH 45)

The course is an introduction to the analysis and design of reinforced concrete members including beams, columns and one-way slabs. Strength and serviceability requirements are considered.

BUD 471: Building Economics and Cost Planning (2 Units: LH 30)

Topics include: practical procedures for building construction estimating of most major trades; analysis of factors and methods affecting construction costs; bid strategies; preparation of preliminary budgets and complete working estimates with quantities and costs of materials, labour and overhead. Computer applications are explored

BUD 431: Construction Plant & Equipment (2 Units: LH 30)

The course introduces the students to the types of plant and equipment used in heavy/large scale construction works, including their principles of operation, and productivity.

BUD 473: Principles of Construction Management (3 Units: LH 45)

The course covers construction project management from conception to completion. The course covers feasibility studies, site selection, planning, programming, design coordination, and contracting procedures of actual construction. Emphasis is placed on contractor operations, project administration, job planning, and subcontract coordination

BUD 491: Operational Research (2 Units: LH 30)

This is a statistics course that equips the student with knowledge of different tools for data analysis as well as results interpretation.

BUD 441: Building Services and Equipment III (2 Units: LH 30)

The course discusses in details, the principles of waste management. It will include drainage systems and the process and technologies involved. It also explores alternative and low carbon energy systems (Renewable Energy systems)

BUD 451: Production Management (2 Units: LH 30)

The course is a detailed presentation on site and off site production of building elements and components. It discusses Modern Methods of Construction and how these relate to methods of procurement, standard forms of contract for the different professionals and tradesmen and site management.

BUD 453: Sociology of Housing (2 Units: LH 30)

Topics include theories of rural settlement origins, their evolution, types and settlement patterns. It also looks at the link between demography culture and resources on one hand and housing on the other.

BUD 455: Business Organization and Accounts (2 Units: LH 30)

Topics include construction financing during all phases of project development involving permanent loans, construction loans, sources of mortgage funds and venture capital, and tax and interest considerations

BUD 457: Rural Development Planning and Basic Infrastructure (2 Units: LH 30)

The course is a presentation of the evolution, types and patterns of rural settlement.

BUD 402: SIWES (18 Units 24 weeks)

BUD 511: Reinforced Concrete Design II (3 Units: LH 45)

This course deals with the design of foundations, analysis and design of plates and shells as well as reinforced concrete frame design.

BUD 521: Advanced Construction Technology I (2 Units: LH 30)

This course details processes, methods and materials for more complex construction elements like deep excavations, cofferdams caissons etc. It will introduce the students to the basic principles and techniques for the adoption and successful application of these methods in construction.

BUD 561: Integrated Studio Work (2 Units: PH 90)

This is a studio based course aimed at consolidating the knowledge and skill the students would have acquired from the different courses over the years.

BUD 563: Specification Writing I (2 Units: LH 30)

Introduction to specification writing with emphasis on the types of specifications and best practice regimes

BUD 571: Project Management I (2 Units: LH 30)

The course introduces the students to Project management as a professional service to clients. Topics include roles, competencies, and modes of engagement.

BUD 573: Professional Practice and Ethics (2 Units: LH 30)

The course introduces the students to the roles of the regulatory bodies in professional building practice with emphasis on the roles of the builder, his/her obligations to the client, society and other consultants in ethical practice.

BUD 591: Project Report (3 Units: PH 135)

This involves the submission of a dissertation of about 15,000 words on a topic of the students' choice under the supervision of a nominated supervisor. The dissertation is normally assessed at the end of the session by both internal and external assessors.

BUD 512: Design of Steel Structures (2 Units: LH 30)

This course introduces the students to steel structures with emphasis on the production process and properties of steel, design of members and the applicable codes and performance specifications.

BUD 522: Advanced Construction Technology II (2 Units: LH 30)

This course is an introduction to industrialized proprietary building systems for different building types and conditions.

BUD 564: Specification Writing II (2 Units: LH 30)

Introduction to specification writing with emphasis on the types of specifications and best practice regimes.

BUD 572: Project Management II (2 Units: LH 30)

A follow on course to Project Management I

Please, forward your comment on any section of this document to the following email:
nucassessment@gmail.com
You can also call the following phone numbers: 08033145087, 08033201097
All comments should be received before 31st October, 2015

BUD 574: Environmental Impact Assessment

(2 Units: LH 30)

The course is an introduction to the principles, processes and methods of Environmental Impacts Assessments. At the end of the course, the students are expected to have sufficient knowledge and skills to carry out simple EIA and understand more complex reports.

DRAFT

3.3 ENVIRONMENTAL MANAGEMENT DEGREE PROGRAMME

3.3.1 Introduction

The benchmark statement for Environmental Management is to provide a guideline for the description and the characteristics of the degree programme and to articulate the abilities and skills expected of graduates of Environmental Management. In the context of Nigerian Universities, a five-year degree leading to a professional Bachelor's degree is being recommended. This statement provides a guide for designing the Bachelor's degree programme. The benchmark statement takes into consideration, current development in the environmental design discipline in general and in Environmental Management in particular. Body of knowledge in the areas of Environmental Impact Assessment, Pollution control, Entrepreneurship, Information Technology and Facilities Management have been incorporated to cater for these developments.

The philosophy of the programme is in the training of Personnel from a wide range of disciplines and backgrounds, to the highest academic standard in the identification and resolution of environmental issues. The programme will provide skilled manpower, trained specifically for environmental surveillance, monitoring and management as against the present practice where these tasks were performed by people trained in Basic and Applied Sciences.

It is focused on the formulation, designing, planning implementation and monitoring of land use patterns and policy programmes and projects and their likely effects on the well-being of various aspects of the environment.

The overall national purposes for environmental resource management education can be stated in general terms as follows:

- To provide a broad based education and training which will assist in developing the students' intellectual and professional capabilities to a high standard
- To produce a sound specialist professional environmentalist who can operate effectively in the field of environmental issues and related activities.

3.3.2 Aims and Objectives of Environmental Management Programme

The main aim of environmental management programme is to produce competent, intellectually mature, ethical, socially responsible environmental resource managers. The specific aims and objectives of Environmental Management programme are to:

- a. Create in student an awareness and comprehension of the range of environmental challenges and opportunities in the immediate and wider region
- b. Provide comprehensive knowledge of management systems, legal framework and social/cultural issues pertaining to utilization of natural resources
- c. Develop skills and knowledge for translating the theory and concepts of resource and environmental management into practice relevant to communities and workplaces today.
- d. Create knowledge about geophysical and biological processes and constraints characterizing human activities and their interaction with the environment
- e. Develop skills in the application of monitoring and environmental management tools used by resource and environmental practitioners.

3.3.3 Programme Duration

Environmental Management training programme is expected to last a minimum of 10 semester's duration leading to an honours degree. A minimum of six months of Work Experience shall be incorporated in the programme.

3.3.4 Admission Requirements

Admission into the programme may be through any of the following modes:

UTME Admission: The minimum academic requirement is credit level passes at not more than two sittings in five subjects at O'Level in nationally recognised examination including English Language, Mathematics and any other three subjects from the following list; Biology, Chemistry, Physics, Technical Drawing, Fine Arts, Geography, Economics, Government and Agriculture.

Direct Entry Admission: Candidates who fulfil the normal admission requirements and who have obtained G.C.E Advanced Level, HSC/IJMB or equivalent passes in Biology and Physics, or Mathematics or Physics, or Geography and any other subject noted above may be admitted at the 200 level of the programme.

3.3.5 Graduation Requirements

A minimum total credit required for graduation is 150 and 120 for UTME and Direct Entry students respectively. In order to graduate, a student must pass all compulsory and required courses as indicated in this BMAS statement.

3.3.6 Resource Requirements for Teaching and Learning

See General Section 1

3.3.7 Courses for Environmental Management Programmes

Courses at 100 level Environmental Management

100-LEVEL ENVIRONMENTAL MANAGEMENT					
Course Code	Course Title	Units	Status	LH	PH
GST 111	Communication in English I	4	C	60	-
GST 112	Logic, Philosophy and Human Existence	2	R	30	-
GST 113	Nigerian Peoples and Culture	2	R	30	-
GST 121	Use of Library, Study Skills & Information Communication Technology (ICT)	2	C	30	-
GST 125	Contemporary Health Issues	2	R	30	-
MTH 101	General Mathematics I	3	C	45	-
MTH102	General Mathematics II	3	C	45	-
CHM 101	General Chemistry I	3	C	45	-
CHM 102	General Chemistry II	3	C	45	-
CHM 107	General Chemistry Practical I	1	C	-	45
CHM 108	General Chemistry Practical II	1	C	-	45
PHY 111	General Physics I	3	C	45	-
PHY 112	General Physics II	3	C	45	-

EVM 101	Introduction to Environmental Science	3	C	45	-
URP 103	Introduction to Land use Planning I	2	E	30	-
GEO 101	Introduction to Elements of Physical Geography	4	R	60	-
URP 104	Introduction to Land use Planning II	2	E	30	-
MCB 101	Introductory Microbiology	2	E	30	45
	Total	45			

Courses at 200 level Environmental Management

200-LEVEL ENVIRONMENTAL MANAGEMENT					
Course Code	Course Title	Units	Status	LH	PH
GST 211	Environment and Sustainable Development	2	C	30	-
GST 222	Peace Studies and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
GST 224	Leadership Skills	2	R	30	-
EVM 201	Natural Ecosystems	3	C	45	-
EVM 202	Natural Resources Conservation and Environmental Management	2	C	30	-
EVM 203	Economics of Environmental Management	3	C	45	-
EVM 204	Environmental Pollution	2	C	30	-
EVM 205	Environmental Degradation	2	C	30	-
EVM 206	Introduction to Valuation	2	C	15	45
EVM 207	Land Law	2	C	30	-
STA 203	Statistics for Physical Science and Engineering	3	R	45	-
EVM 211	Environmental Sociology	3	R	45	-
GEO 201	Introduction to Geomorphology and Soil Geography	2	R	30	-
GEO 205	Land Surveying	3	R	30	45
SOC 212	Social Change	2	R	30	-
CSC 101	Introduction to Computer Science	2	R	15	45
	Total	39			

Courses at 300 level Environmental Management

300 LEVEL ENVIRONMENTAL MANAGEMENT					
Course Code	Course Title	Units	Status	LH	PH
EVM 302	Environmental Protection	3	C	45	-
EVM 303	The Nature and Types of Wastes	3	C	45	-
EVM 307	Land degradation and Restoration Ecology	2	C	15	45
EVM309	Environmental Law	3	C	45	-
GEO 320	Terrain Evaluation	3	C	45	-
EVM 311	Tourism Development Planning	2	C	30	-
GEO 315	Hydrology	2	R	30	-

GEO 316	Soil Studies I	2	R	15	45
URP 307	Planning Law and Administration I	2	R	30	-
GEO 313	Geographic Information System I	2	R	15	45
EVM 301	Environmental Problems	3	C	45	-
EVM 304	Quantitative Techniques in Environmental Management	3	C	45	-
EVM 305	Environmental Planning and Management	2	C	30	-
EVM 306	Population and Environmental Change	2	C	30	-
EVM 308	Computer Application in Environmental Management	3	C	30	45
URP 310	Urban Renewal	3	E	45	-
GEO 319	Advanced Land Surveying	2	R	15	45
GEO 321	Remote Sensing I	2	E	15	45
URP 315	Metropolitan Planning	2	E	15	45
GST 311	Entrepreneurship	2	R	30	-
	Total	48			

Courses at 400 level Environmental Management

400-LEVEL ENVIRONMENTAL MANAGEMENT					
COURSE Code	Course Title	Units	Status	LH	PH
EVM 401	Research Method I	3	C	45	-
EVM 402	Solid Waste Management	2	C	15	45
EVM 403	Sewage and Waste Water Treatment	2	C	30	-
EVM 404	Parks and Open Space Planning and Management	2	C	30	-
EVM 405	Environmental and Planning Law	3	C	45	-
EVM 406	Resource Use and Conservation	3	C	45	-
EVM 407	Management of Non-Living Resources	2	C	30	-
EVM 408	Wildlife Conservation and Landuse	2	R	30	-
EVM 409	SIWES	18	C	24 weeks	
GEO 413	Soil Studies II	3	R	30	45
GEO 415	Demography	3	E	45	-
GEO 421	Environmental and Resources Management	3	R	30	45
GEO 424	Geographic Information System II	3	R	30	45
GEO 423	Advanced Remote Sensing	3	E	30	45
	Total	52			

Courses at 500 level Environmental Management

500-LEVEL ENVIRONMENTAL MANAGEMENT					
COURSE Code	Course Title	Units	Status	LH	PH
EVM 501	Research Method II	3	C	45	
EVM 502	Project Dissertation	6	C	-	270
EVM 503	Water Quality Assessment and Management	3	C	30	45
EVM 504	Soil Erosion and Environmental Management	3	C	45	-
EVM 505	Environmental Health	3	C	30	45
EVM 506	Environmental Education and Field Ecology	3	R	30	45
EVM 507	Environmental Management Seminar	3	C	-	135
EVM 508	Environmental Impact Assessment	3	C	15	90
EVM 509	Environmental Ethics and Professional Practice	3	C	45	-
EVM 510	Environmental Engineering Services	2	C	30	45
EVM 511	Environmental Audit	3	R	30	45
EVM 512	Natural Hazards	2	R	45	
EVM 513	Landscape Design, Assessment and Classification	2	R	15	45
EVM 514	Case Studies	2	R	-	90
	Total	41			

3.3.8 Synopses of Courses in Environmental Management Degree Programme

EVM 101: Introduction to Environmental Science (3 Units: LH 45)

Energy system in the atmosphere, biosphere, hydrosphere and lithosphere. Current environmental issues, including air pollution and other natural hazards, droughts, earthquakes, hurricanes, floods etc.

CSC 101: Introduction to Computer Science (2 Units: LH 15, PH 45)

History of Computers, functional components of Computer, Characteristics of a computer, problem solving, flow charts Algorithms, computer programming statements, symbolic names, Arrays, subscripts, expressions and control statements. Introduction to Basic or Fortran Programming Language, Computer Applications

MCB 101: Introduction to Microbiology (2 Units: LH 15 PH 45)

History and development of Microbiology; Pure culture and media; Principles of sterilization, problems of infectivity; Fundamental principle of life.

EVM 201: Natural Ecosystems (3 Units: LH 45)

Components of environment and the interaction among components, types of ecosystems (ecosystems as habitat); Principal plants in West Africa, their ecology as related to grazing; Factors affecting flora and fauna distribution at various scales. Vegetation changes through time, adaptation, succession and climax.

EVM 202: Natural Resources Conservation and Environmental Management (2 Units: LH 30)

Natural resources, concepts and definitions; Natural resources exploitation; Environmental/ecological implications of threatened/endangered natural resources (i.e. forests and wildlife species); sustainable use and conservation of natural resources.

EVM 203: Economics of Environmental Management (3 Units: LH 45)

Land as a scarce and exhaustible resources. Location theory, economic basis of urbanization, conflicting and competing demands for land use and conservation. Relationship between land use and land value. Effect of land use and land value on the operation of price mechanism. The process of land development economics of real estate, nature and function of the urban property, urban area, financial development and economic concepts.

EVM 204: Environmental Pollution (2 Units: LH 30)

Sources of pollution and types (air, water, noise), Green house effect; ozone layer depletion, Types of pollutants (chemical, Biological) Pollution Control.

EVM 205: Environmental Degradation (2 Units: LH 30)

Comprehensive studies of the types, causes and consequences of environmental degradation. Highlights of environmental degradation factors (e.g. uncontrolled deforestation, urbanization, industrialization, wars, erosion, flood, desertification, salinity, bush fires, etc.) Protective measures to sustainably conserve and manage the environment. Sources of pollution. Major pollutants of air, soil and water; noise pollution, management of pollutants; Ozone layer depletion and the green house effect.

EVM 206: Introduction to Valuation (2 Units: LH 15, PH 45)

The nature and definition of value; Definition and purpose of valuation; the function of value economic, Constitutional, geographical, environmental, political and legal basis of property value. The effect of the international situation. The capital market and the principles governing interest rates and yield market analysis. Structure and environmental surveys and reports for valuation; the mathematical background and construction of valuation table.

EVM 207: Land Law (3 Units: LH 45)

Source of Nigerian land law, classification and types of property, ownership and possession, real property, customary land law; Nature of title to land under customary law. Nature and management of community land. Industrial rights in community land. Creation and determination of family property under customary law.

STA 203: Statistics for Physical Sciences and Engineering (3 Units: LH 45)

Measures of central tendency and dispersion (grouped and ungrouped): mean-arithmetic, geometric, median, mode, qualities, deciles and percentiles. Empirical relation between means, median, and mode relationship and absolute dispersion. Simple space and events as sets. Finite probability space; properties of probability statistical independence and conditional probability. Tree diagram. Bayes theorem. Discrete and continuous random variables. Expectation. Independent Bernoulli trails. Binomial passion and normal distributions. Normal approximation to binomial and Poisson distributions. Hyper geometric.

EVM 211: Environmental Sociology (3 Units: LH 45)

Impact of culture on the environment. The sacred forests (sacred groves) their original and functions including conservation values, protective role of culture (e.g. tradition including taboos) on plant and animal diversity and conservation. Effects of pollution, policy and education on the environment (e.g. Land use decree and Structural Adjustment Programme). Socioeconomic and cultural roles of conservation programme.

SOC 212: Social Change (2 Units: LH 30)

An analysis of the nature and mechanisms of the transformation that African societies have undergone (and are undergoing) since the colonial encounter with the Western world. The colonial situation and African responses to it; the emergence of new economic, social, political institutions, status structures and ideological orientations, as well as the crisis of development in the post-colonial era will be explored. Theories of social change (e.g. functionalist, conflict, etc) are implicated throughout the discussion.

EVM 301: Environmental Problems (3 Units LH 45)

Meaning and definition of environmental problem. Recognition of environmental problem. Nature, magnitude and severity of environmental problem. Causes and sources of environmental problems. Barriers to solving environmental problems. Dealing with/solving environmental: preventive measures; remedial measures.

EVM 302: Environmental Protection (3 Units LH 45)

Soil erosion: causes, prevention and control technique (e.g. tree planning, use of sustainable farming system etc). Reclamation techniques for degraded mine sites, sand dune management (e.g. sand dune fixation with indigenous, and exotic plant species), zone afforestation and reforestation programmes. Reclamation/Rehabilitation of wetland, shelter belt establishment and management, micro and macro climatic applications.

EVM 303: The Nature and Types of Waste (3 Units: LH 45)

Meaning and definitions of wastes. Characteristics of wastes. Classification of wastes. Criteria/modes of classification: (i) state of the matter (ii) degradable or non-degradable. Types of wastes. Sources of wastes

EVM 304: Quantitative Techniques in Environmental Management (3 Units: LH 45)

Review of descriptive and basic inferential techniques. Hypothesis testing. Bivariate linear correlation and regression. Analysis of variance. Multiple liner correlation and regression. Principal components and factor analysis. Forecasting techniques. Possibilities and limitations in planning practice and research.

EVM 305: Environmental Planning & Management (2 Units: LH 30)

Principles of management as applied to the environmental profession. Personnel management in environmental management, methods of financing of plans, implementing and managing land use plans (Political, technical, administrative requirements). The civil services and central administration. Private sector participation in environmental management and project implementation, management of Technical staff and office at Local, State and federal levels. Theories of Power (Elitism, pluralism and maxims).

EVM 306: Population and Environmental Change (2 Units: LH 30)

Components of the environment, the interaction among components, types of ecosystem, ecosystem and habitats; population and environmental change. Population growth, distribution patterns, population trend and environment.

EVM 307: Land Degradation and Restoration Ecology (2 Units: LH 15, PH 45)

Types of Erosion, desertification, sand dunes, etc. Socio-Economic effects of deforestation, biodiversity loss, etc. Causes and sources of land degradation and amelioration strategies. Resource exploitation, its implication on the environment. Principles of Agro-forestry, forest-tree crop integration. Sustainable management and conservation of environment.

EVM 308: Computer Application in Environmental Management

(3 Units: LH 15, PH 45)

To understand the basic techniques of map making, use of variety of cartographic and other devices for mapping and gathering environmental data; scope and limitations of the visual presentation of statistics sources. Scale and error factors, map design, the logic of conceptual diagrams including system diagrams.

EVM 309: Environmental Law

(3 Units: LH 45)

Basic concept of environmental standard criteria and regulation. Federal environmental laws organisation of environment protection. States edict and regulation on the environment, plant and animal quarantine. Regulations and enforcement mechanisms, violations and sanctions. Comparative study of environmental laws in some advance countries. e.g. USA, Canada, Thailand, etc. International Laws and conventions.

EVM 311: Tourism Development Planning

(2 Units: LH 30)

To advance the knowledge of recreation and (R&T), attributes and categorization of (R & T) resources, infrastructure services and participation, socio-economic evaluation and the ecological impacts. Definition and Concept. Nature and classification of tourism resources and recreational land uses. Water base (R&T) Land base (R&T). Urban and Rural distributions Infrastructure and services. Administration and Management of (R & T). The positive and negative impacts of Recreation and Tourism.

EVM 401: Research Method I

(3 Units: LH 45)

Identifying potential research areas. Literature review: elements, structure, and importance

Formulating aims and objectives. Types and sources of data for research in Environmental management:

Past projects records; Surveys ; Laboratory investigations

Understanding of the role of research in Environmental Management and ways to undertake a research. Current methodology of Environmental management research, including: recent paradigm shifts within scientific approach to Environmental research, quantification and classification in Environmental management; theories and models in Environmental management.

EVM 402: Solid Waste Management

(2 Units: LH 15, PH 45)

To make students aware of the impact of various pollutant with emphasis on atmosphere, water and soil: Environmental monitoring system. Abatement and control of solid waste. Refuse dump site, treatment and land fill.

EVM 403: Sewage and Waste Water Treatment (2 Units: LH 30)

Treatment, disposal and management of Sewage. Management of solid waste, collection and disposal. Method of site investigation for planning utilities public health laws in Nigeria – case study.

EVM 404: Parks and Open Space Planning and Management (2 Units: LH 30)

Parks Surveys, sitting and construction of roads and tourist facilities and supervisor of anti poaching control. Open space for flood control, for future development, development control, for recreation, etc.

EVM 405: Environment and Planning Law (3 Units: LH 45)

The origin of urban and regional planning law in Nigeria. Its nature, scope and contents in the framework of the Nigerian judicial system. Powers and duties of the planning authorities; planning schemes; development control. Acquisition and disposal of land for planning scheme – compensation and betterment. The structure and working of the Nigerian legal system. The courts and their procedure, tribunals and inquiries, reference to courts for decision in any matter affecting a planning scheme and legal proceedings. Acts relating to highways, public health, industrial location e.t.c.

EVM 406: Resource Use and Conservation (3 Units: LH 45)

Natural resources; uses of natural resources, exploitation of natural resources and environmental/ecological implications of threatened/endangered natural resources i.e. forest and wildlife species. Sustainable use of natural resources including conservation strategies.

EVM 407: Management of Non-Living Resources (2 Units: LH 30)

Basic concepts of non-living/non-renewable/exhaustible/stock resources, Exploration and exploitation of fossil fuels- coal, oil and gas, solid minerals, etc. Effects of exploration and exploitation on the environment. Illegal exploitation of non-living resources. Management of non-renewable resources in Nigeria and other parts of the world. Community resource development, Appropriating the value of non-living resources.

EVM 408: Wildlife Conservation and Landuse (2 Units: LH 30)

Nigerian forest wildlife and conservation policies; traditional land use practices, charges- in land-use practices, population growth and land use practices. Management planning of game reserves and national parks. Wildlife management needs.

EVM 409: SIWES (15 Units: 26 WKS)

Students are supposed to get familiar with the major activities taking place in their places of attachment. Depending on the nature of their places of attachment, they are to participate in activities like map making, planning practices land, soil and water resources evaluation; human and socio-economic surveys, basic operation of field and laboratory equipment and facilities, practical and operational climatology, instrumentation in geography; and any other assignment given to them by their industrial based Head of Department. Report on the entire exercise/ experience.

EVM 501: Research Method II (3 Units: LH 45)

Qualitative and quantitative research methods. Methods of data collection. Interview; types, objectives, recording. Questionnaires: types, development. Design of experiments

(laboratory procedures). Description of materials and methods in experimental research. Hypothesis; formulation of hypothesis; testing of hypothesis; concept of significance. Methods of data analysis; types, choice and description. Interpretation of data analysis results. Computer based analysis. Referencing and bibliography. Communication skills and oral presentation (defence) of research projects

EVM 502: Project Dissertation

(6 Units: PH 270)

The student is expected to undertake research work on any chosen topic as a special area of study as it pertains to the environment and environmental management. Students are required to demonstrate ability for individual research techniques, making contribution to knowledge with some guidance of an academic staff throughout the project. The examination will be conducted with a viva, which will be attended by the external examiner.

EVM 503: Water Quality Assessment and Management

(3 Units: LH 30, PH 45)

Water sources, demand and supply, treatment and distribution. Sources of water pollution (i.e. urban storm water run-off, industrial run-off, pesticides, thermal pollution, pathogens in water supplies, toxicology, water pollution control.

EVM 504: Soil Erosion and Environmental Management

(3 Units: LH 45)

Soil erosion causes, prevention and control techniques, e.g. tree planting, use of sustainable farming systems, etc. Reclamation techniques for degraded mined sites. Sand dune management. E.g. sand dune fixation indigenous and exotic plant species. Arid zone afforestation and reforestation programmes. Reclamation/rehabilitation of wetlands, shelter belt establishment and management.

EVM 505: Environmental Health

(3 Units: LH 30, PH 45)

This course exposes students to what health really means. The effect of man's domestic, industrial and other productive activities on human health and family. It also elaborates on acceptable ameliorative measures to maintain environmental health, applying recent health models and theories.

EVM 506: Environmental Education and Field Ecology

(3 Units: LH 30, PH 45)

The nature and potentials of the Natural Social and Human built environment, and their interdependency. Reciprocal relationship between man and environment. The family in an Ecosystem. The natural habitats. The Role of humans in environmental decay and preservation.

EVM 507: Environmental Management Seminar

(3 Units: PH 135)

Students are expected to choose topics on issue relating to the environment, students will be required to make a presentation of the chosen topic.

EVM 508: Environmental Impact Assessment

(3 Units: LH 15, PH 90)

Environmental impact of human actions. Response of society to environmental changes. Bio-geophysical and socio-economic impacts. Administrative procedures in planning/decision making of environmental impact assessment (EIA). Contents of EIA. Methods for identifying, predicting and interpreting impacts/effects and inspection procedures. Conceptual framework for EIA using simultaneous models and policy analysis. Socio-economic methods or EIA with respect to current socio-economic environment and methods for deriving impacts.

EVM 509: Environmental Ethics and Professional Practice (3 Units: LH 45)

The course deals with environmental management practice as a profession. Its relationship with clients and other bodies; principles of writing brief, decision making, code of conduct as prescribed by the professional body, procedures for membership, the politics of professionalism.

EVM 510: Environmental Engineering Services (2 Units: LH 15 PH 45)

The course will enable students to advance knowledge in engineering services and applicable installations, i.e. electricity, water supply, telephone services e.t.c.

EVM 511: Environmental Audit (3 Units: LH 30 PH 45)

Definition, general principles of environmental monitoring. Organisation of auditing and monitoring programmes for site and resource specific strategies. Classification of monitoring techniques and use (physical, chemical, biological radioactive) global sources, sinks and transport (mass balance) of both man-made and natural atmospheric trace components, Ocean-atmosphere interactions, reversible effect of human activities on the global environment e.g. green house effect, climate change, depletion of stratosphere ozone layer, acid rain. Air pollution meteorology, chemistry and biology. Atmosphere dispersion models. Elements of air pollution control. Sampling and air monitoring techniques. Mechanism of pollutant interaction with soil and vegetation. General principles of biotesting, aquatic toxicity, types, bio, assays, data analysis and interpretation.

EVM 512: Natural Hazards (2 Units: LH 30)

The study will identify and examine the causes and consequences of natural hazards such as drought, land and coastal erosion, floods, landslides, desertification, strong winds etc and measures for control.

EVM 513: Landscape Design Assessment and Classification (2 Units: LH 15 PH 45)

Values, forces and institutions shaping urban form; principles of Landscape in urban design. Movement pattern and space organization. Scale in space organization. Elements within organized space. Theoretical concepts and approaches to urban form and design. Understanding emerging urban design realities in Nigerian towns and cities (e.g. functional distribution of mass and voids in relation to circulation and amenities). Studies of bases for designing cities (i.e. climate, landform, construction materials; and methods, cliental, and generic landscape impacts; environmental impact statement (EIS)

EVM 514: Case Studies (2 Units: PH 90)

Review of the early regional plans for Doncaster Regional Planning Scheme 1922; South Wales regional Survey 1920; Plans for London and South East England 1944 – 1971: Also reviews of recent regional plans for East Anglia Regional Strategy. Regional Development plans for F.C.T. Abuja 1982.

3.4 ESTATE MANAGEMENT DEGREE PROGRAMME

3.4.1 Introduction

Estate Management is the art and science of supervising the use, development and management of landed property, other natural resources and the built environment, and the valuation of all interests subsisting therein. The estate management programme is designed to prepare students to appreciate the complexity of legal, economic, technological and social impacts on the use, development and management of land and the environment. The emerging world trend in technological advancement and environmental concern, calls for the need to design responsive programmes for the training of future graduates in Estate Management.

3.4.2 Aims and Objectives

The primary goal of Estate Management education is to produce competent Estate Surveyors and Valuers with sufficient technical knowledge and skill in order to optimize the use of land resources to facilitate economic development.

The Estate Management education programme should be committed to:

- a) Instil in students an appreciation of the complex nature of the relationships between man and his environment.
- b) Involve the students in an intellectually stimulating and satisfying experience of learning and studying.
- c) Provide a broad and balanced foundation of the knowledge of land and buildings and their exploitation and use.
- d) Develop in students the ability to apply their analytical skills in the solution of theoretical and practical land resource problems.
- e) Develop in students, entrepreneurial skills of value in self-employment in the profession.
- f) Develop in the students lifelong skills in an ever changing economic, technological and political world.
- g) Creating enabling environments that will foster active interest in research and development in Estate Management and related fields
- h) Create an appreciation of the importance of estate surveying and valuation in an industrial, environmental, economic and social context.
- i) Develop the students in the use of Information Technology in the effective management of land and the environment.

It is expected that the students will be conversant with the following main aspects of estate surveying and valuation:

- Knowledge and appreciation of the mathematical processes used in analysis and presentation, and developing intelligence in tackling practical problems, logically and sequentially.
- Use of data to describe the real world and using statistical calculations to understand and present practical data.
- Appreciation of building forms and drawings and to understand the construction of buildings and building services and contemporary building materials.
- Acquisition of basic knowledge of the practical use of surveying instruments, measurement of buildings and land surveying.
- The construction industry and its relation to the national economy.

- Appreciation of spatial inequalities, the relationship between cities and the structure and development of cities, regions and urban areas. The components of an urban system and factors affecting urban growth and development. The role of industrial growth in urban development
- The use of the law to regulate and control the use and development of land.
- Definition and scope of modern day agriculture and the use of land for agriculture, forestry and wildlife. Forest regulations, exploration deforestation, regeneration and afforestation.
- Understand basic principles and methodology of economics and economic institutions and government policy.
- Appreciate accounting theory and develop an understanding of accounting as an information system in real estate business.
- Understand basic industrial processes where the Estate Surveyors and Valuers' skills may be required.
- Land as an economic resource and the use of the economic principles to develop and manage land.
- The principles and practice of land resource appraisals and management.
- Development, management and maintenance of land and buildings.
- Managing buildings as a complex unit of the structure and its facilities.
- Theories and practices of land resource planning, development, utilization and forecasting.
- Landed property rating and taxation.
- The valuation of specialized properties like plant and machinery, minerals, properties etc.
- Principles and applications of Geographic and Land Information Systems and the computer environment
- Human resource management in complex development projects.
- Project planning and implementation
- Predictions and assessments of impacts of land development projects on the environment (Environmental Impact Assessment)
- Measurement and Control of Pollution, Erosion and other natural disasters.
- Environmental Management and Control
- Estate Surveying and Valuation Practice Ethics and code of conduct in the real world
- Basics of small business management.

3.4.3 Programme Duration

The expected duration of the Bachelor's Degree in Estate Management will be a minimum of ten semesters for UTME admission students or a minimum of eight Semesters and a maximum of ten Semesters for Direct Entry students.

3.4.4 Admission Requirements

Admission into the Estate Management programmes may be through any of the following modes:

UTME Admission: Candidates who have successfully completed the Senior Secondary School or its equivalent and obtained five credits in Mathematics, English Language, Economics and two other subjects from the following; Chemistry, Physics Business Studies/ Commerce, Geography, Biology, Agricultural Science and Technical

Drawing will be eligible for admission currently through the Unified Tertiary Matriculation Examinations (UTME).

Direct Entry Admission: Candidates who fulfil the requirements above and who have obtained G.C.E. Advanced level, H.S.C/IJMB or equivalent passes in two relevant subject or who hold a National Diploma (ND) or Higher National Diploma (HND) in Estate Management or an allied profession or professional certificate may be admitted into the 200 - level of the programme. Holders of HND with upper credit could be admitted into 300 level undergraduate programme.

3.4.5 Graduation Requirement

A student is expected to have passed a total minimum of 150 credit units, completed one semester SIWES attachment and successfully completed a terminal dissertation in order to qualify for graduation. The 150 credit units must include all compulsory and required courses.

3.4.6 Learning Outcomes

At the end of the Bachelor's degree in Estate Management, a graduate should be able to perform the following:

- a) Manage any type of 'land' within an existing framework, towards achieving any organizational goal, either in the private or public sector.
- b) Carry out property management involving preparation of schedules of condition and dilapidation; identifying building defects, specifications, remedies and organization of maintenance works.
- c) Prepare Valuation of any proprietary interest in land plant and machinery and landed property for all purposes and advising on their values.
- d) Carry out feasibility and Viability studies in relation to proposed developments.
- e) Prepare development proposals on the suitability of land for residential, commercial, industrial, recreational and other developments and advising on their economic and financial aspects.
- f) Carry out Cost-Benefit Analysis of projects and advice on their desirable locations.
- g) Carry out Research into the problems of the physical environment and advising on the values of damages to the environment. Provide data for policy formulation on land resources allocation, development, utilization and maintaining a balance in the ecosystem.
- h) Advise on the acquisition of land by compulsory purchase and or revocation of rights. Preparation of claims, settlement of terms with acquiring authorities and presenting expert evidence on value.
- i) Advise on the value of landed properties and other land resource components of business organizations for sale or exchange.
- j) Manage complex buildings and its facilities to ensure a controlled working environment.
- k) Cooperate with other professionals in solving contemporary land/environmental problems.
- l) To perform a mediatory role in the arrangement of real estate financing
- m) Start up a business in private practice involving any of the items/functions listed.
- n) Be appointed as expert witness in court proceedings or tribunals involving any of the functions stated.

3.4.7 Resource Requirements for Teaching And Learning

See section 1.6 for more details

3.4.8 Courses for Estate Management Programmes**Courses at 100 level Estate Management**

100-LEVEL ESTATE MANAGEMENT					
Course code	Course title	Units	Status	LH	PH
GST 111	Communication in English I	2	C	30	-
GST 112	Logic, Philosophy and Human Existence	2	R	30	-
GST 113	Nigerian Peoples and Culture	2	R	30	-
GST 121	Use of Library, Study Skills and Information Communication Technology (ICT)	2	C	30	-
GST 122	Communication in English II	2	C	30	-
GST 125	Contemporary Health Issues	2	R	30	-
MTH 101	Elementary Mathematics I	3	C	45	-
MTH 102	Elementary Mathematics II	3	C	45	-
ESM 101	Introduction to Estate Management I	2	C	30	-
ESM 102	Introduction to Estate Management II	2	C	20	-
GEO 106	Introduction to Environmental Science	3	C	45	-
ECO 102	Principles of Economics I	2	C	30	-
ECO 112	Principles of Economics II	2	C	30	-
ECO 101	Introduction to Accounting	2	R	30	-
BUD 101	Introduction to Building I	2	R	15	45
BUD 102	Introduction to Building II	2	R	15	45
BUD 103	Technical Drawing	2	R	15	45
ARC 162	Planning the Built Environment	2	E	30	-
ARC 121	Architectural Graphics and Lettering	2	E	-	90
	Total	41			

A minimum of 2 units of elective courses are recommended per semester

Courses at 200 level Estate Management

200-LEVEL ESTATE MANAGEMENT					
Course Code	Course Title	Units	Status	LH	PH
GST 211	Environment and Sustainable Development	2	R	30	-
GST 222	Peace Studies and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
ESM 211	Agricultural Production I	3	C	45	-
ESM 212	Agricultural Production II	3	C	30	45
ESM 221	Land Economics I	2	C	30	-

Please, forward your comment on any section of this document to the following email:

nucassessment@gmail.com

You can also call the following phone numbers: 08033145087, 08033201097

All comments should be received before 31st October, 2015

ESM 222	Land Economics II	2	C	30	-
ESM 231	Principles of Soil Science	2	C	15	45
ESM 251	Computer Application I	2	C	15	45
ESM 252	Computer Application II	2	C	15	45
BUD 221	Building Construction and Materials I	3	R	45	-
BUD 222	Building Construction and Materials II	3	R	45	-
BUD 261	Land Surveying I	2	R	15	45
BUD 262	Land Surveying II	2	R	15	45
CIL 201	Law of Contract I	3	R	45	-
CIL 202	Law of Contract II	3	E	45	-
	Total	38			

A minimum of 2 units of elective courses are recommended per semester

Courses at 300 level Estate Management

300-LEVEL ESTATE MANAGEMENT					
Course Code	Course Title	Units	Status	LH	PH
ESM 301	Valuation I	2	C	15	45
ESM 302	Valuation II	2	C	15	45
ESM 303	Elements of Property Management	2	C	30	-
BUD 331	Building Maintenance I	2	C	15	45
BUD 332	Building Maintenance II	2	C	15	45
BUD 341	Building Services and Equipment I	2	C	15	45
BUD 342	Building Services and Equipment II	2	C	15	45
BUD 302	Statistics for Builders	2	C	30	-
ESM 352	Site Analysis and Management	2	C	15	45
ESM 341	Agricultural Economics I	2	R	30	-
ESM 342	Agricultural Economics II	2	R	30	-
ESM 305	Arbitration and Awards I	2	C	30	-
ESM 307	National and Rating Taxation I	2	C	30	-
ECO 201	Introduction to Micro- Economics	4	R	60	-
ECO 202	Introduction to Macro- Economics	4	R	60	-
ESM 306	Arbitration and Awards II	2	R	30	-
ESM 308	National and Rating Taxation II	2	R	30	-
GST 311	Entrepreneurship	2	R	30	-
	Total	40			

A minimum of 2 units of elective courses are recommended per semester

Courses at 400 level Estate Management

400-LEVEL ESTATE MANAGEMENT					
Course Code	Course Title	Unit(s)	Status	LH	PH
ESM 401	Estate and Development Finance	3	C	45	-
ESM 402	Comparative Land Policies	2	C	30	-
ESM 403	Project Planning and Control	3	C	30	45
ESM 404	Urban Land Economics	2	C	30	-
ESM 405	Research Methods I	3	C	45	-
ESM 406	Office Production and Management	2	C	15	45
ESM 407	Public Health Engineering	2	C	15	45
ESM 409	Administrative Law	2	C	30	-
ESM 408	SIWES	18	C	24 wks	
BUD 441	Building Services and Equipment III	2	E	15	45
BUD 454	Production Management	2	E	30	-
BUD 464	Business Organization and Accounts	2	E	30	-
BUD 482	Sociology of Rural Housing	2	E	15	45
GEO 421	Environmental and Resources Management	3	E	30	45
PPL 305	Property Law Nigerian I	4	E	45	45
PPL 306	Property Law Nigerian II	4	E	45	45
	Total	56			

A minimum of 2 units of elective courses are recommended per semester

Courses at 500 level Estate Management

500-LEVEL ESTATE MANAGEMENT					
Course Code	Course Title	Units	Status	LH	PH
ESM 501	Advanced Valuation I	3	C	30	45
ESM 502	Advanced Valuation II	3	C	30	45
ESM 503	Research Method II	3	C	45	-
ESM 504	Feasibility and Viability Appraisal I	2	C	15	45
ESM 505	Feasibility and Viability Appraisal II	2	C	15	45
ESM 506	Applied Property Management I	2	C	30	-
ESM 507	Applied Property Management II	2	C	30	-
ESM 508	Professional Practice and Ethics	3	C	45	-
ESM 512	Project Dissertation	6	C	-	270
ESM 509	Estate Law	2	R	30	-
ESM 510	Landuse and Resource Management I	2	R	15	45
ESM 511	Landuse and Resource Management II	2	R	15	45
ESM 513	Case Studies/Seminar	2	R	-	90
ESM 514	Administration of Public Property	2	R	30	-
BUD 551	Project Management I	2	E	15	45
BUD 552	Project Management II	2	E	15	45
ESM 515	Advanced Computer Application in Estate Management	2	E	15	45
	Total	42			

A minimum of 2 units of elective courses are recommended per semester

3.4.9 Synopses of Courses in Estate Management Degree Programme

ESM 101: Introduction to Estate Management I (2 Units: LH 30)

This course is an introduction to management principles and theories especially as they relate to properties.

ESM 102: Introduction to Estate Management II (2 Units: LH 30)

Property management defined; types of properties involved; professional organizations; duties and job descriptions of property managers; applying principles of property management.

CSC 101: Introduction to Computer Science (2 Units: LH 15, PH 45)

History of Computers, functional components of Computer, Characteristics of a computer, problem solving, flow charts Algorithms, computer programming statements, symbolic names, Arrays, subscripts, expressions and control statements. Introduction to Basic or Fortran Programming Language, Computer Applications.

ECO 101: Economic Principles I & II, (4 units: LH 60)

An introduction to the various issues, the nature of economic science, the methodology of economics, major areas of specialization in economics, stressing historical development of ideas, major findings in the various areas of specialization, elementary principles of micro and macro-economics, current issues of interest and probable future developments.

ECO 103: Introduction to Accounting (2 Units: LH 30)

The nature, scope and purpose of accounting. Basic financial statements. Accounting conventions. Theory and mechanics of double-entry book-keeping. Books of original entry. The cash book and the ledger, classification, recording and summary of business transactions. The revenue accounts and balance sheets of business concerns. The valuation of assets and measurement of business income. The interpretation of accounts; significant accounting ratios. Sources and application of funds statements

ESM 211: Agricultural Production I (3 Units: LH 45)

Classification and ecology of crops in Nigeria. Nutrient requirements and mineral nutrition of plants. Manure and fertilizers. Cropping sequences and ration. Tillage. Use control. Irrigation. Soil conservation. Harvesting, processing and storage of crops. Farming systems

Principles of crop production including climatic factors and types of cropping system, land preparation, planting protection and harvesting annual crops and perennial crops.

ESM 212: Agricultural Production II (3 Units: LH 30, PH 45)

Forces that derive the atmosphere. Major features and models of atmospheric circulation Weather-producing systems. Man's influences on atmosphere. Basic structure and dynamics of plant communities. Factors influencing plant growth. Survey of characteristics, distribution and controlling factors of vegetation. Agro-forest regions of Nigeria Soil profiles, soil formation and influence of parent material, relief, climate, vegetation, texture, structure, moisture relationships and soil air.

ESM 221: Land Economics I

(2 Units: LH 30)

Meaning of Land. Concept of rent. Land market, price determination, and location theory. Land resources requirements. Comparative and complementary land uses. Demand for land (local and global) and its relation to population and resources. Theories of consumption.

Theories of income. Theories of land asset prices. Nature of land investment; decisions and appraisal. Divergence of private and social costs. Problems of resource allocation; conservation of land resources Concept of land use capacity. Concepts of highest and best use

Principle of comparative and absolute advantages; application in allocation of resources. Organization and its effects on values. Reasons for urbanization. Economic advantages and disadvantages of urbanization. Land use values and patterns; value determination. General patterns of land use within urban areas.

ESM 222: Land Economics II

(2 Units: LH 30)

Man's dependence on land. Man/Land relationships within physical, economic and institutional frameworks. Importance and nature of decision-making. Descriptive models of decision-making units ('proprietary' and 'social'). Proprietary decisions: Goals and motive; Criteria for evaluation constraints; Households' and firms' location decision. Development decision-making processes: landowners, developers, and planners. Finance for development; financial institutions. Cost/benefit analysis as an aid to land use decision-making. Relation between proprietary land units: Superior, inferior relationships, Neighbours, successors. Conflicts between proprietary and social interests; pollution – types of problems and approaches to control. Public investment and planning decisions. Outline of selected aspects of land policies in Nigeria and elsewhere Variety of policy frameworks within which land use decision are taken. Land policy and land reform. Land use planning machinery. Rural and agricultural policy. Landlord and tenant legislation. Leisure and social policy. Analysis of Landuse decisions

ESM 231: Principles of Soil Science

(2 Units: LH 15, PH 45)

Soil formation. Soil classification; shape and size Classes of soil structure. Soil profile; soil horizons and layers. Physical, chemical and biological properties of soils. Soil as basis for ecosystems. Soil and water systems. Soil amelioration. Soil conservation. Nigerian soils; properties and uses

ESM 251: Computer Application I

(2 Units: LH 15, PH 45)

Brief history of computer development. Hard ware components of computer. Microsoft Word applications. Microsoft Excel applications. Microsoft Power Point applications. Internet use; Estate management related website guide

ESM 252: Computer Application II

(2 Units: LH 15, PH 45)

AutoCAD use. Engineering CAD. SPSS applications

CIL 201: Law of Contract I

(3 Units: LH 45)

Nature of Contract: Sources of Law, concept of bargain, classification. Formation of Contract: Offer and Acceptance, consideration, intention to create legal relations. Contents of Contract: Terms, representations exclusion and limiting terms and fundamental breach of terms. Capacity: Infants, illiterates, corporations, mental patients and drunken persons.

CIL 202: Law of Contract II (3 Units: LH 45)

Vitiating Elements of a Contract: mistake, misrepresentation; duress; illegality and unenforceable contracts. Privity of Contract: Rules and exceptions. Discharge of Contract: By performance, agreement, breach and frustration. Remedies/Damages; Equitable remedies in outline only, Quantum merit claims in quasi contract.

STA 203: Statistics for Physical Sciences and Engineering (3 Units: LH 45)

Measures of central tendency and dispersion (grouped and ungrouped): mean-arithmetic, geometric, median, mode, qualities, deciles and percentiles. Empirical relation between means, median, and mode relationship and absolute dispersion. Simple space and events as sets. Finite probability space; properties of probability statistical independence and conditional probability. Tree diagram. Bayes theorem. Discrete and continuous random variables. Expectation. Independent Bernoulli trials. Binomial distribution and normal distributions. Normal approximation to binomial and Poisson distributions. Hyper geometric.

MTH 204: Linear Algebra I (2 Units: LH 30)

Vector space over the real field. Subspaces linear independence, basis and dimension. Linear transformations including linear operators, linear transformations singular transformations and matrices. Algebra of matrices.

MTH 205: Linear Algebra II (2 Units: LH 30)

Systems of linear equations, change of basis, equivalence and similarity. Eigenvalues and eigenvectors. Minimum and characteristics of polynomial of a linear transformation (matrix). Cayley-Hamilton theorem. Bilinear and quadratic forms, orthogonal diagonalisation. Canonical forms.

ESM 301: Valuation I (2 Units: LH 15, PH 45)

Factors affecting supply and Demand for land and buildings. Principles of Investment. Stocks and shares. Interest rates and investment yields the property market methods of valuation.

ESM 302: Valuation II (2 Units: LH 15, PH 45)

Analysis of sales and letting of freehold and leasehold properties, use of valuation tables. Effect of income tax on sinking fund, premiums, surrender and renewals of leases.

ESM 303: Elements of Property Management (2 Units: LH 30)

Management theory. Management evolution, principles of management, forecasting, planning, organization, co-ordination, control, motivation, communication.

ESM 352: Site Analysis and Management (2 Units: LH 15, PH 45)

ESM 341: Agricultural Economics I (2 Units: LH 30)

Principles and goals of agricultural development. Agricultural policy; agricultural development in Nigeria. Structure of production units. Capital and labour inputs. Farm organisation and production. Economics of world agricultural development.

ESM 342: Agricultural Economics II (2 Units: LH 30)

Agricultural prices and price analysis. Food distribution: retailing perspective. Marketing farm products. Agricultural finance. Financial management of agricultural business. Supply chain management for food and agribusiness. International agricultural trade.

ECO 201: Introduction to Micro-Economics (4 Units, LH: 60)

Micro-economic theory, problem of scarce resources and allocation of resources in product and factor markets with application to Nigerian and other economies, equilibrium concept, possibility of disequilibrium, partial equilibrium and general equilibrium analyses. Supply and demand theory, Cobweb theory, Introductory dynamics. Consumer behaviour, General equilibrium of exchange. Production theory. Cost curves. Pricing and output under perfect competition, imperfect competition, monopoly and monopolistic competition. Pricing of production factors. The theory of comparative costs.

ECO 202: Introduction to Macro-Economics (4 Units, LH: 60)

Macro-economic theory, national income accounting, macro-economic aggregates, the classical system, the Keynesian system, the monetarist system, domestic economic stabilisation, monetary and fiscal policies, price control and inflation.

ESM 305: Arbitration and Awards I (2 Units: LH 30)

Nature of arbitration; its origin and application to valuation. Act reference to arbitration by consent. Types of arbitration. Statutory and conventional advantages of arbitration. Arbitration and umpires. Principal rules of arbitrators. Reference by order of court; neutral and tripartite panel. Procedure for arbitration award. Expert evidence and proof of evidence. Arbitration of real estate and related disputes in construction Industry. Particular skills required of a professional costing as arbitrators in the construction industry. Real estate documents and arbitration clauses. Resolution of disputes by arbitration in the allied professions in the construction industry. Distinction between valuation, arbitration and action methods of enforcing and impeaching an award.

ESM 306: Arbitration and Awards II (2 Units: LH 30)

Arbitration Agreement, Composition of Arbitral Tribunal, jurisdiction of arbitral tribunal, award and termination of proceedings, recourse against award, recognition and enforcement of awards; difference between arbitration and conciliation

ESM 307: National and Rating Taxation I (2 Units: LH 30)

Income tax nature and incident. Allowances on deductions. Assessment of owners and occupiers of landed property. Taxation of capital. Estate duty. Capital transfer tax. Elementary principles of national finance with particular reference to central and local government finance. The caucus and principles of taxation. Taxation distinguished from other land burdens. Methods of taxation proprietary interests in land. Income tax. Inheritance tax. Local rates and other statutory charges. National taxation policies relating to land.

ESM 308: National and Rating Taxation II (2 Units: LH 30)

Organization and administration of rating. Valuation list and preparations objections; proposal and appeals. Assessment of properties. Occupation and hereditament. Tone of list; Gross value; Net annual value; Rateable value. Rebus sic stantious. Rating valuation practice. Hypothetical tenant; Valuation assumptions. Vacant and to let exemptions.

Adjustment of Gross value to net annual value. Alterations of the valuation list.
Aggrieved person.

ESM 401: Estate and Development Finance (3 Units: LH 45)

Meaning and purpose of accounting. Income statement and balance sheets. Analysis and interpretation of accounts. Source of development capital, budgeting and financial forecasting Estate development/investment decision. Demand, cost, acceptable return, timing, Finance. Programme of investment. Organization of operations. Source of finance: internal funds, consociate capital, short-term funds (bank and trade credit), long-term funds (loan and share capital), building societies, finance institutions, property companies, other private sources; public sources. Development Agencies; Development process.

ESM 402: Comparative Land Policies (2 Units: LH 30)

The nature of customary tenure in the economic and social structure of selected countries in West Africa. Social and legal theories of property; proprietary land use analysis Purpose of progress in national land reforms in selected countries Implementation of land policies and specialized institutions of land policies and specialized institution of government and other bodies related to social relationships and land tenure. Classification of land tenure systems as a basis of comparative study. Principles of alienation and occupation of public land. A comparison of right of occupancy system i Nigeria. Land reform; classification of land reforms objectives and methods National land policies.

ESM 403: Project Planning and Control (3 Units: LH 45)

The course introduces common scheduling tools, including critical path method and bar charts as an aid in project planning, budgeting, and cost control. Also introduces the gathering, processing, and evaluation of project information for effective project control.

ESM 404: Urban Land Economics (2 Units: LH 30)

Urban economics as a field of study. The nature of urban areas. Problem of urban economy. Urban land use and transportation; congestion, traffic and parking Technology and city spatial structure and growth. Urban economic base. Pollution and environmental quality in Nigeria. Overview of environmental-oriented policy measures in Nigeria. Urban policy: need for policy, arguments for and against urban policy formulation, antecedent and contemporary urban policy measures in Nigeria. New town development; public and private development
Planning and compensation. Betterment problem

ESM 405: Research Methods I (3 Units: LH 45)

Identifying potential research areas. Literature review: elements, structure, and importance

Formulating aims and objectives. Types and sources of data for research in construction: Past projects records, surveys , laboratory investigations. Qualitative and quantitative research methods. Methods of data collection. Interview; types, objectives, recording. Questionnaires: types, development. Design of experiments (laboratory procedures). Description of materials and methods in experimental research. Hypothesis; formulation of hypothesis; testing of hypothesis; concept of significance. Methods of data analysis; types, choice and description. Interpretation of data analysis results. Computer based

analysis. Referencing. Bibliography. Communication skills and oral presentation (defence) of research projects

ESM 406: Office Production and Management (2 Units: LH 15, PH 45)

Organization of personnel. Job description. Chain of authority. Departmentalization, specialization. Physical Organizations. Office records. Communication and co-ordination. Office procedure. Cash-flow. Personnel management. Role of an estate surveyor and valuer in the public and private sectors.

ESM 407: Public Health Engineering (2 Units: LH 15, PH 45)

Basic elements of estate engineering. Primary infrastructure: Water supply system, water circulation, sources of water; Rainfall runoff, collection and storage; Sewage disposal system: types, characteristics, quantity and quality; Factors affecting sewage planning and development; Sewage treatment plants; Septic tanks and soak-away systems; Drainage systems. Bye-laws

ESM 408: Administrative Law (2 Units: LH 30)

Agencies and executive branch: Appointment of officers, removal of officers, agency powers.

Obtaining information from the government. Agency policymaking: Rule v. order, rulemaking, due process, adjudication

PPL 305: Property Law I (4 Units: LH 45 PH 45)

Introduction: (a) legal notions of property (b) historical evolution of land law in Nigeria (c) sources of Nigerian land law (d) terminology – ownership, possession, titles, rights, liability, land, etc. Customary land law/Islamic land law: (a) modes of acquiring title to land, settlement; expansion; loan or borrowing; pledge or pawn; gift; conquest, allotment, kola tenancy (b) concept and ownership of land: (i) nature of title to land (ii) control and management of community land – individual rights and extent of community land today (iii) creation of family land – nature and extent of member's right in family land; control of family land, alienation of family land, recovery of family land, Improvement by a member of family land, termination of family land (iv) an outline of succession to rights in land.

PPL 306: Property Law II (4 Units: LH 45; PH 45)

Legal regulation of property: (a) The Land Use Act – state control of land; grant of right of occupancy; what Certificate of Occupancy connotes; alienation of Certificate of Occupancy; revocation of Certificate of Occupancy; compensation for revocation (b) relationship between Land Use Act and State land law (c) an outline of control of natural resources – minerals, water and forests; agrarian reforms (d) rights and interest in land – freehold, joint tenancy, tenancy in common, prescription, laches, acquiescence, leasehold, easements, *profit a prendre*, covenants, mortgages, (e) registration – registration of instruments, registration of title.

ESM 409: SIWES (PH: 24 Weeks)

Students are supposed to get familiar with the major activities taking place in their places of attachment. Depending on the nature of their places of attachment, they are to participate in activities like map making, planning practices land, soil and water resources evaluation; human and socio-economic surveys, basic operation of field and laboratory equipment and facilities, practical and operational climatology,

instrumentation in geography; and any other assignment given to them by their industrial based Head of Department. Report on the entire exercise/ experience.

ESM 501: Advanced Valuation I

(3 Units: LH 30, PH 45)

Statutory Valuation. Effect of legislation on property value. Current legislation in Nigeria Valuation of property assets of a company. Role of value in the property market. Trends in value. Mortgage valuation, insurance valuation, going concern valuation. Principles and methods involved in the valuation of company assets Companies and partnerships. Valuation of goodwill. Valuation of plant and machinery.

ESM 502: Advanced Valuation II

(3 Units: LH 30, PH 45)

Site analysis and site valuation. Capitalization of income from freehold interests in property including DCF approach. Capitalization of income from leasehold property. Dual rate adjusted for tax. Single rate valuation of leasehold interests in property. Categories of leasehold investment and valuation approaches. Valuation of leasehold investment; variable profit rents. Calculation of premiums. Renewal and extension of lease. Cost-in-the market area analysis. Effect of planning, current economic conditions and legislation on value of property. Developmental valuation. Mineral valuations; capital, budgeting, cash flow. Residual techniques of valuation. Valuation of specialized properties including petrol filling stations, hotels. Contemporary methods of valuation: capital asset pricing model (CAPM), real value approach, natural model, modified national model

ESM 503: Research Methods II

(3 Units: LH 45)

Identifying potential research areas. Literature review: elements, structure, and importance

Formulating aims and objectives. Types and sources of data for research in construction: Past projects records, Surveys, Laboratory investigations. Qualitative and quantitative research methods. Methods of data collection. Interview; types, objectives, recording. Questionnaires: types, development. Design of experiments (laboratory procedures). Description of materials and methods in experimental research. Hypothesis; formulation of hypothesis; testing of hypothesis; concept of significance. Methods of data analysis; types, choice and description. Interpretation of data analysis results. Computer based analysis

Referencing. Bibliography. Communication skills and oral presentation (defence) of research projects.

ESM 504: Feasibility and Viability Appraisal I

(2 Units: LH 15, PH 45)

Nature of investment projects; identification and preparation. Application of modern appraisal techniques – discounted cash flow, internal rate of return and net present value, sensitivity analysis, cost-benefit analysis. Principles and techniques of investment appraisal and application to property. Pick and uncertainty in valuation. Effects of taxation and inflation. Estate surveyors as an adviser of investments, property development scheme, property investment markets. Procedure and methods of assessing economic demand for a particular project. Principal sources of finance for funding a development including techniques of direct property financing.

ESM 505: Feasibility and Viability Appraisal II

(2 Units: LH 15, PH 45)

Investment decision process. Examination of projects from investment point of view. Sources of information: financial plans, feasibility studies. Project supervision and

management, monitoring and evaluation. Examination of techniques of site evaluation. Relationship between capital return and developments yields Alternative cash flow methods of calculating development costs including the incorporation of building cost inflation and rental growth. Risk in financial appraisals: simple sensitivity and probability analysis, simulation.

ESM 506: Applied Property Management I (2 Units: LH 15, PH 45)

Development and re-development process. Property management in relation to social, political, economic, physical and location aspects. Property management process – strategy of estate owners and choice of alternative to achieve owner's objectives. Estate-cycle and problems of obsolescence. Principles of estate management applicable to management of public and private estate, new towns, expanding towns, local authority redevelopment area. Implications for estate management of legislation pertinent to relationship between the landlord and tenant. Marketing and agency: legal positions of principal and agent; methods of sale promotion; selling market segmentation; market research, market planning, total project management. Parties involved in property development. Data and information for property development. Sources of finance and funding arrangements for development Feasibility Studies – Residential/Commercial properties. Effect of Government policy in development process with emphasis on land policy implications. Management of Institutional Housing and Commercial Estates: principles, procedures, and problems. Rule of thumb in real estate practice.

ESM 507: Applied Property Management II (2 Units: LH 15, PH 45)

Maintenance Management of Buildings. Concepts of Building Maintenance. Liability for defects in buildings. Maintenance needs, nature of maintenance. Rehabilitation, alterations, and improvements. Design and maintenance concepts. Life cycle costing and appraisal techniques. Building Management; general concepts of client departments, janitorial supplies, service, and staff organization. Inventories listing and administration. Ground and paved area maintenance. Maintenance of drainage works. Accounts for various bills: electricity, water, etc. Maintenance management: property management organization and functions of maintenance unit within the set-up. Types of maintenance; contingency and planned maintenance management systems. Maintenance policies and strategies, management information systems for building maintenance. Concept of tenant participation in maintenance and self-help schemes in public housing management. Maintenance budgets

Execution of maintenance work (DLO or contract Labour), contract administration and management. Job evaluation and monitor/feedback systems. Policy issues on conservation/Disposal. Motivation of maintenance workers

ESM 508: Professional Practice and Ethics (3 Units: LH 30, PH 45)

This course is designed to provide a basic knowledge of how the estate surveyor and valuer undertakes his work in a professional manner

Professional approach: Definitions and explanations; Rule of professional practice and code of conducts; Nigerian Institute of Estate Surveyors and Valuers. The Estate Surveyors and Valuers Registration Board of Nigeria. Other professional bodies in Nigeria. Professional Instructions and Government. Professional firms, groups, partnership and their organisation and management

ESM 509: Estate Law (2 Units: LH 30)

Purchase and sale of property. Construction contracts. Property management. Environmental compliance. Land use regulations. Real estate transactions. Income tax of real estate transactions. Negotiation/mediation. Secured transactions. Advanced legal writing: contract drafting

ESM 510: Landuse and Resource Management I (2 Units: LH 30, PH 45)

Land Resources. Human settlement and land use in Nigeria. Evolution growth structure and pattern of human settlement. Proprietary land capital and income. Obsolescence and urban renewal. Relocation problems. Economic forces that influence land uses, through succession of land uses and the competition between uses which are evident in the operation of the land market Economics of land uses in non-market societies. Urban land use and location. Development of the theory of location, economics of location. Land uses and land values, patterns of urban land use. Man-land relationship. Economic and legal concept of land. Rural and urban land uses and theory of allocation. Population pressure and supply and demand for land resources. Urban growth theories: theory of highest and best uses, competition and competing uses Proprietary land structure in Nigeria. Economic returns to land resources, property values and real estate market, property rights in land resources location of theory and land uses. Acquisition and transfer of rights. Leasehold system.

ESM 511: Landuse and Resource Management II (2 Units: LH 30, PH 45)

Property market and estate Investment. Estate Development. Public control of land use. Land reform, reform objective and methods. Classification of land. Housing: the provision of shelter in human settlements. Influence of climate, topography, social order and economic conditions upon housing. Housing policy with particular reference to housing as a social need and private investment. Urban housing problems, nature of urban housing. Housing market. Urban renewal. Capital costs and rental income. Urban transportation: problems involved in traffic congestion Theories on road pricing. Transport-land use in Nigeria. Conservation of land resources. National land policy: relative instruments and empirical guidance. Taxation of landed property. Urban environmental pollution management. Use of economic criteria in public investment and planning.

ESM 512: Project Dissertation (6 Units: PH 270)

At the end of this training, the student should be able to demonstrate an appreciation of and the capacity to recognize the integration and contribution of the various contributory subjects which give the discipline its distinctive and unique kernel. The student should also be able to apply the total body of knowledge acquired, especially in independent and original way, to the solution of specific practical problems.

ESM 513: Case Studies/Seminar (2 Units: PH 30)

Case studies in Estate Management

ESM 514: Administration of Public Property (2 Units: LH 30)

Characteristics of public property. Government agencies and statutory bodies concerned with property ownership. Occupation and land administration. Motives of public ownership and occupation of properties. Positive management as applied to public property

Please, forward your comment on any section of this document to the following email:
nucassessment@gmail.com
You can also call the following phone numbers: 08033145087, 08033201097
All comments should be received before 31st October, 2015

BUD 551: Project Management I

(2 Units: LH 15, PH 45)

The course introduces the students to Project management as a professional service to clients. Topics include roles, competencies, and modes of engagement.

ESM 515: Advanced Computer Application in Estate

(2 Units: LH 15, PH 45)

GIS application in estate management. GPS application in estate management Computer integrated estate management.

DRAFT

3.5 FINE ARTS DEGREE PROGRAMME

3.5.1 Introduction

The philosophy of academic training in Fine and Applied Arts (the visual Arts) is for the development artistic skill with regards to accurate expression in drawing, painting, sculpture and related fields. This also takes into consideration manipulation of forms and materials for stimulating visual creativity for an enterprise.

3.5.2 Aims and Objectives

The Aims and Objectives of the Programme are:

- a) To create and emphasize the interrelation between art (as creative expression) and cultural growth in the humanities, as well as a cultural catalyst with close relationship to Science and Technology.
- b) To produce painters, sculptors, potters, printmakers, illustrators, textile designers and graphic designers upon completion of training.
- c) To apply the imparted knowledge and skills to influence developments in Architecture, Urban Planning and landscape Design, resource management and modern technology in general.
- d) To use knowledge and skills acquired to reflect and advance the hopes and aspirations of the society.

Fine and Applied Arts Graduates are therefore, expected to depend a greater deal of their studies and experiences solving national problems of how to project Nigeria and develop it culturally and technology.

3.5.3 Programme Duration

The minimum recommended duration of the degree programme in Fine and Applied Arts is eight (8) academic semesters. A six month students' industrial training scheme (SIWES) will form part of the education programme.

3.5.4 Admission Requirements

Admission to Fine Arts Programme can be categorized into the following modes:

UTME Admission: The minimum academic requirement is credit level passes in five subjects at O'Level in nationally recognised examination including English Language, Mathematics, Fine Arts or Technical Drawing and any other two subjects or the National Technical Certificate (NTC) in a relevant subject area will be eligible for admission currently through the Unified Tertiary Matriculation Examinations (UTME)

Direct Entry Admission: Candidates who fulfil the requirements above and who have obtained two (2) Advanced level G.C.E. passes in Art or Fine Arts and any other subject, National Certificate of Education (NCE); in a relevant subject area or National Diploma (ND) may be admitted into the 200 level of the programme.

3.5.5 Aims and Objectives of Fine and Applied Arts Programmes

The specific objectives of Fine and Applied Arts training programme are:

- a) To produce artists and designers capable of understanding and solving complex problems in the field of fine and Applied Arts.
- b) To train competent graduate artists with knowledgeable Fine Art processes, use of materials and skills and their techniques and technology and management.

- c) To promote adequate general knowledge and specific skills and techniques to enhance the effective performance of graduates in the special areas to use materials with technological methods for the benefit of human resources and economic and social needs.
- d) To interrelate with other professionals in the allied fields of literary Arts, Industrial and Engineering Design, Architecture production Industries and fully skilled with production techniques for public service and self employment entrepreneurship activities.

3.5.6 Instructional Modules

The Fine Arts training programme is normally in two parts; foundation and specialization. The foundation training offers general courses at the first and second years of study. The second segment of the training programme involves some form of specialization in an 'applied' field of study. Two general areas of application are as follows:

1. Fine Arts with Painting and Sculpture options
2. Applied Art with Graphic Design Option, Ceramic Design Option and Textile Design Option

Courses in Fine and Applied Arts education therefore fit into any one of the four modules listed below:

- i. Cognitive Knowledge
- ii. Area of Specialization
- iii. General Electives
- iv. General skills

Module I: Cognitive Knowledge

This module will include the following course types:

- General Drawing
- Element and principles of Fine and Applied Arts
- History of Art and Design
- Art Education theories and practices

Module II: Area of Specialization

- Graphic Design (Applied)
- Textile Design (Applied)
- Ceramic Design (Applied)
- Painting
- Sculpture
- Art education
- Art History

Module III: General Electives

- Humanities
- Education courses
- Social Sciences
- Cultural Studies

Module IV: General Skills

- Use of English Language course
- Library Studies
- Information Technology
- Computer Literacy Courses
- Industrial Training
- Entrepreneurship courses
- Research and Development

3.5.7 Resource Requirements for Teaching and Learning

Personnel

a) Academic staff

Suitably qualified and experienced lecturers are essential for quality fine arts education. It is necessary that such staff are also actively engaged with the profession either through practice or research. A minimum recommended academic staff/student ratio for the fine arts programme is 1:15.

In order to enrich the learning experience of the students as well as to sustain the practice of indigenous arts and crafts it is recommended that traditional arts and craftsmen may be invited to the as Artists - in - Residence for specified periods. It is anticipated that such interactions will enable them to transfer their skill to younger generation.

3.5.8 Courses for Fine Arts Degree Programme

Courses at 100 level Fine Arts

Course Code	Course Title	Units	Status	LH	PH
FAA121	Basic Drawing I	2	C	-	90
FAA122	Basic Drawing II	2	C	-	90
FAA111	Two Dimensional Design I	3	C	-	135
FAA112	Two Dimensional Design II	3	C	-	135
FAA113	Three Dimensional Design I	3	C	-	135
FAA114	Three Dimensional Design II	3	C	-	135
FAA 151	Art appreciation I	3	C	45	-
FAA152	Art appreciation II	3	C	45	-
SOC 101	Introduction to Sociology	4	R	60	-
SOC 102	Introduction to African Societies and Cultures	2	R	30	-
GST 111	Communication in English I	2	C	30	-
GST 112	Logic, Philosophy & Human Existence	2	R	30	-
GST 113	Nigerian Peoples and culture	2	R	30	-
GST 121	Use of Library, study skills & ICT	2	C	30	-
GST 122	Communication in English II	2	C	30	-
GST 125	Contemporary Health Issues	2	R	30	-
	Total	40			

A minimum of 2 units of elective courses are recommended

Courses at 200 level Fine Arts

Course code	Course Title	Units	Status	LH	PH
FAA225	Still-Life Drawing	2	C	-	90
FAA221	Painting	3	C	-	135
FAA227	Sculpture	3	C	-	135
FAA231	History of Art I	3	C	45	-
GST 211	Environment and Sustainable Development	2	C	30	-
CS201	Computer Graphics I	2	R	-	90
GST 205	One Foreign Language	2	R	30	-
FAA222	Figure Drawing	2	C	-	90
FAA226	Textile	3	C	-	135
FAA224	Pottery	3	C	-	135
FAA232	History of Art II	3	R	45	-
FAA234	History and Philosophy	2	C	30	-
FAA211	Environmental education & Awareness	3	C	45	-
GST 222	Peace Studies and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
	Total	37			

A minimum of 2 units of elective courses are recommended per semester

Courses at 300 level Fine Arts

Course Code	Course Title	Units	Status	LH	PH
FAA321	Draughtsmanship I	2	C	-	90
FAA322	Draughtsmanship II	2	C	-	90
FAA323	Area of Specialization	8	C	-	360
FAA334	Area of Specialization	8	C	-	360
FAA331	History of African art	2	C	30	-
FAA333	African Craft Techniques	2	C	30	-
	Environmental Law	2	C	30	-
CSC 201	Computer Graphics II	2	C	-	90
	Humanities/Social Science	4	E	60	-
FAA336	Creative Exploration of Indigenous Forms & Materials	2	E	30	-
GST 311	Entrepreneurship	2	R	30	-
	Total	36			

A minimum of 2 units of elective courses are recommended per semester

Courses at 400 level Fine Arts

400-LEVEL FINE ARTS					
Course Code	Course Title	Units	Status	LH	PH
FAA421	Advanced Drawing I	2	C	-	90
FAA422	Advanced Drawing II	2	C	-	90
FAA411	Area of Specialization I	8	R	-	360
FAA412	Area of Specialization II	8	R	-	360
FAA451	Contemporary African Art	2	C	30	-
FAA453	Advanced Exploration of Indigenous Art forms I	2	C	30	-
FAA454	Advanced Exploration of Indigenous Art forms II	2	C	30	-
FAA431	Long Essay /Project Report I	4	C	-	180
FAA452	Long Essay /Project Report II	4	C	-	180
FAA432	African architecture	2	C	30	-
	Total	36			

A minimum of 2 units of elective courses are recommended per semester

3.5.9 Synopses of Courses in Fine Arts Degree Programme

FAA 121: Basic Drawing I (2 Units: PH 90)

Analytical and expressive drawing will be explored to develop technical, intellectual and observational skills

FAA 122: Basic DrawingII (2 Units: PH 90)

Exploration into various approaches to drawing

FAA 111: Two Dimensional Design I (3 Units: PH 135)

Treatment and use of various surfaces for design purposes, presentation of surface decoration balance, compositional balance, pictorial unity, harmonies and contracts. Introduction to the nature of colours. Exercises from still-life and simple objects and original imaginative composition uses and care of materials. Projects in basic design, optical illusion

FAA 112: Two Dimensional Design II (3 Units: PH 135)

FAA 111 (Continued). Treatment and use of various surfaces for design purposes, presentation of surface decoration balance, compositional balance, pictorial unity, harmonies and contracts. Introduction to the nature of colours. Exercises from still-life and simple objects and original imaginative composition uses and care of materials. Projects in basic design, optical illusion

FAA 113: Three Dimensional Design I (3 Units: PH 135)

Elements and principles of 3 dimensional concepts of arts and design description, definition of sculpture, its coinage and brief history, introduction to studio equipment through modelling stand. Introduction to sculpture forms. Sculpture in the round, introduction to day types, primary and secondary. Special projects for individual need obtaining and using materials from local sources. Simple sculptures of fruits, leaves and

other plant life studies of simple natural forms such as hands, feet, ear etc. in day and other materials

FAA 114: Three Dimensional Design II (3 Units: PH 135)

FAA 113 (Continued): Elements and principles of 3 dimensional concepts of arts and design description, definition of sculpture, its coinage and brief history, introduction to studio equipment through modelling stand. Introduction to sculpture forms. Sculpture in the round, introduction to day types, primary and secondary. Special projects for individual need obtaining and using materials from local sources. Simple sculptures of fruits, leaves and other plant life studies of simple natural forms such as hands, feet, ear etc. in day and other materials

FAA 151: Art Appreciation I (3 Units: LH 45)

The course will develop the student's appreciation of the visual arts through theory and practice

FAA 152: Art Appreciation II (3 Units: LH 45)

The course will develop the student's appreciation of the visual arts through theory and practice

SOC 101: Introduction to Sociology (4 Units: LH 30)

Introduction to the field of Sociology; Sociology and other Social Sciences. Basic concepts and principles of Sociology; Introductory analysis and description of social structure and dynamics of human society.

SOC 103: Introduction to African Societies and Cultures (2 Units: LH 30)

The study and criticism of ethnographic descriptions of African societies, people and their cultures, both as scientific reporting and as a literary art form. A survey of African societies and cultures in a contemporary setting; the cultural regions, social organizations, language, polity, economy and world views.

FAA 225: Still-Life Drawing (2 Units: PH: 90)

An introduction to the fundamental principles and concepts of visual art through a series of drawing exercises using a variety of materials.

FAA 221: Painting (3 Units: PH 135)

This course is an exploration of the problems and possibilities of painting as a vehicle for serious creative expression. The fundamentals of composition and painting techniques will be presented through a series of studio projects.

FAA 227: Sculpture (3 Units: PH 135)

An introduction to sculpture in which the creation of 3-dimensional form will be explored

FAA 227: History of Art I (3 Units: LH 45)

This course is not intended to be a chronological survey of the history of art. Rather, it is an introduction to art and to art in history. The primary aims of the course are: to develop the visual skills and acquire the vocabulary needed to analyze a work of art; to examine works of art according to techniques and materials

FAA 221: Computer Graphics (2 Units: LH 30)

The course is an introduction to electronic imaging with emphasis on basic graphic design. Students will learn to create, develop, manipulate and enhance two-dimensional colored images using PC Windows's drawing and painting graphics packages.

FAA 222: Figure Drawing (2 Units: PH 90)

Introduction to quick sketches; articulation of joints and human movement, equilibrium and motion, notation of poses (Relaxed, Sitting, Reclining, Standing and Motion) human activities, clothing and human figure.

FAA 226: Textile (3 Units: PH:135)

Introduction to various design on paper. Techniques of design lay-out, printing and setting of colours, sketches motif repeat, colour application, colour scheme. Different tools and materials to be used in resist technique. Creative work on different resisting agents and dyes

FAA 224: Pottery (3 Units: PH 135)

Introduction to basic design aspect of ceramics, hand building and wheel throwing forming techniques. Improvisation of and use of common tools and materials in of a pottery studio, wood, Metal, Plastic and other Modelling tools. Glazing and kiln firing are also introduced

FAA 232: History of Art II (2 Units: LH 45)

This course focuses primarily on the art and architecture of Medieval Europe and pre-colonial Africa. The objects that will be discussed include: church, collegial and castle architecture; sculpture; jewellery; vestments; stained glass windows; and manuscripts. Particular attention will be paid to how these objects functioned in these societies.

FAA 321: Draughtsman-ship I (2 Units: PH 90)

FAA 322: Draughtsman-ship II (2 Units: PH 90)

FAA 323: Area of Specialization I (8 Units: PH 360)

FAA 324: Area of Specialization II (8 Units: PH 360)

FAA 321: History of African Art (2 Units: LH 30)

This course presents literature on geographical distribution of African art form; from rock art of North Africa though ancient Sahara to eastern and southern Africa. It includes works from Egypt and Sudan and West Africa.

FAA 333: African crafts & Techniques (2 Units: LH 30)

Introduction to indigenous craft techniques in wood carving, bronze, easting, weaving, dyeing, jewellery, Metal work, pottery, leather work, beadwork and embroidery

FAA 336: Creative exploration of indigenous forms and materials (2 Units: LH 30)

The course will involve intensive, experimental exploration and development of individual studio practice in painting, research into the work of related artists and African art styles.

FAA 421: Advanced Drawing I (2 Units, PH 90)

An exploration of drawing problems in a variety of media. The emphasis is on students becoming familiar with contemporary approaches to drawing and developing their own individual expression

FAA 422: Advanced Drawing II (2 Units, PH 90)

FAA 421 (Continued): An exploration of drawing problems in a variety of media. The emphasis is on students becoming familiar with contemporary approaches to drawing and developing their own individual expression

FAA 411: Area of Specialization I (8 Units: PH 360)

FAA 412: Area of Specialization II (8 Units: PH 360)

FAA 451: Contemporary African Art (2 Units: LH 30)

This course explores issues that confronted artists working in Canada in the 20th century. The physical environment and interaction of cultures are two dominant themes. Artistic practice in Canada is also placed within international contexts. Although painting figures prominently, other mediums such as sculpture, photography and experimental film will also be discussed.

FAA 453: Advanced exploration of indigenous art forms and materials I (2 Units: LH 30)

This course will examine these works of art and the artists against this backdrop. Arranged according to patrons, the course also examines particular stylistic trends

FAA 454: Advanced exploration of indigenous art forms and materials II (2 Units: LH 30)

This course will examine these works of art and the artists against this backdrop. Arranged according to patrons, the course also examines particular stylistic trends

FAA 432: African Architecture (2 Units: LH 30)

This course focuses primarily on the art and architecture of pre-colonial Africa. The objects that will be discussed include: domestic and non domestic architecture; sculpture; jewellery; clothing and other elements of the material culture.. Particular attention will be paid to how these objects functioned in traditional societies.

3.6 GEOGRAPHY DEGREE PROGRAMME

3.6.1 Introduction

The Philosophy underlying the Geography degree programme is to produce a crop of graduates equipped with appropriate knowledge to make effective contributions to the development of Nigeria, Africa and the global community having been exposed to a broad foundation of knowledge in the field of Environmental Sciences in general and in the various sub-fields of Geography in particular.

3.6.2 Aims and Objectives of Geography Education programme

The general goal of geography education programmes is to produce competent graduates with sufficient contemporary theoretical knowledge and practical skills to deal with planning, design, construction and management of geographic and other societal issues. The specific objectives are:

- 1) To instil in students a sound knowledge of Geography, an appreciation of its applications in different socio-cultural contexts and to involve the students in an intellectually stimulating and satisfying experience of learning and studying the workings of society.
- 2) To provide students with broad and well balanced knowledge of geographical theories and methods.
- 3) To cultivate in students the ability to apply their geographical knowledge and skills to the understanding and solution of societal problems in Nigeria and elsewhere.
- 4) To provide students with relevant knowledge and skill base from which they can proceed to further studies in special areas of Geography or multi-disciplinary areas involving Geography.
- 5) To instil in students an appreciation of the importance of Geography in spatial and environmental contexts.

To develop in students a range of useful competencies in public, private or self-employment.

3.6.3 Programme Duration

The minimum recommended duration of the bachelor's degree programme in Geography is Eight (8) academic semesters. A students' Industrial Training programme of six months duration shall be incorporated in the programme without prejudice to the minimum academic semesters recommended above.

3.6.4 Admission Requirements

Admission into the geography programme may be through any of the following modes:

UTME Admission: Candidates seeking admission into the four year degree programme in Geography are expected to possess a Senior Secondary Certificate Examination result, General Certificate of Education, NECO or their equivalents with at least five credit passes, at not more than two sittings. The credit passes must include Mathematics, English Language and Geography and any two from Biology, Agricultural Science, Economics and Physics. In addition, candidates will normally have sat for and obtained satisfactory scores in the UTME exams.

Direct Entry Admission: A candidate who fulfils UTME admission requirements above and in addition holds a Higher School Certificate, GCE Advanced Level, IJMB and or a National Diploma (ND) in an appropriate discipline may be admitted into the 200 level of the programme. In addition, holders of Higher National Diploma (HND) may be placed at appropriate level of study. Any deficiencies in a candidate's background may be rectified by taking appropriate courses.

3.6.5 Graduation requirements

Total minimum credit required for graduation is 120 and 90 for students admitted through UTME and Direct Entry admissions respectively. In order to graduate, a student must pass all compulsory and required courses.

3.6.6 Instructional Modules

Each University is advised to ensure that students become conversant with the following main aspects of Geography.

- Major aspects of the history of geographical thought, the development of Geography as a spatial subject, the development of various branches of Geography including physical, human and other techniques.
- Core theories and concepts in all branches of Geography.
- Geographical methods of data collection and processing both qualitative and quantitative.
- Models and Maps in geographical analysis.
- Statistical methods in Geographical analysis.
- Appropriate information technology that is adequate in the digital age.

3.6.7 Resource Requirements for Teaching and Learning

See section 1.6

3.6.8 Courses for Geography Degree Programme

Courses at 100 level Geography

100-LEVEL GEOGRAPHY					
Course Code	Courses title	Units	Status	LH	PH
GEO 101	Introduction to Elements of Physical Geography	4	C	60	-
GEO 102	Introduction to Elements of Human Geography	4	C	60	-
GEO 103	Introduction to Practical Geography	4	C	30	90
GEO 104	Local Field Studies	3	C	-	135
GST 111	Communication in English I	2	C	30	-
GST 113	Nigerian Peoples and Culture	2	C	30	-
GST 121	Use of Library, Study Skills (ICT)	2	C	30	45
GST 122	Communication in English II	2	C	30	-
GEO 105	Elementary Land Surveying	2	R	30	45
GEO 106	Introduction to Environmental Science	3	R	45	-
GEO 107	Introduction to Land-use Planning	2	R	30	-
MTH 101	Elementary Mathematics I	2	R	30	-

GLY 102	Introduction to Minerals and Rocks	3	R	45	-
MTH 102	Elementary Mathematics II	3	R	45	-
ARC 112	Planning and the Built Environment	2	R	30	-
ARC 122	Freehand and life Drawing	4	R	30	90
SOC 112	Introduction to Social Anthropology	3	R	45	-
ECO 112/122	Economic Theory/Principles I & II	4	E	60	-
	Total	53			

Courses at 200 level Geography

200-LEVEL GEOGRAPHY					
Course Code	Courses Title	Units	Status	LH	PH
GEO 201	Introduction to Geomorphology and Soil Geography	2	C	30	-
GEO 202	Introduction to Climatology and Biogeography	2	C	30	-
GEO 203	Spatial Organization of Society	3	C	45	-
GEO 204	Map Analysis	3	C	30	90
GEO 205	Elementary Land Surveying	3	C	30	45
GEO 206	Elementary Cartography	4	C	45	45
GEO 207	Introduction to Remote Sensing	3	C	30	45
GEO 208	Introduction to Geographic Information System	2	C	15	45
GEO 209	Field Course	3	C		135
GST 211	Environment and Sustainable Development	2	C	30	-
GST 222	Peace and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
GEO 210	Statistics for Geographers	2	R	30	-
GEO 211	Regional Geography of West Africa	2	R	30	-
GEO 212	Geographical Thought Theory	2	R	30	-
STA 203	Statistics for physical Sciences and Engineering	3	R	45	-
GLY 201	Physical Geology	2	R	30	-
ECO 219	Urban and Regional Economics	2	R	30	-
ECO214 /224	Structure of Nigerian Economy I & II	4	R	60	-
SOC 212	Social Change	2	R	30	-
ARC 222	Freehand Drawing	4	R	30	90
	Total	54			

Courses at 300 level Geography

Course Code	Courses Title	Units	Status	LH	PH
GEO 301	History of Geographical Thought	3	C	45	-
GEO 302	Geomorphology	2	C	30	-
GEO 303	Climatology	2	C	30	-
GEO 304	Biogeography	2	C	30	-
GEO 305	Population Geography	2	C	30	-
GEO 306	Economic Geography	2	C	30	-
GEO 307	Settlement Geography	2	C	30	-
GEO 308	Regional Geography of Africa	2	C	30	-
GEO 309	Research Method I	2	C	30	-
GEO 310	Quantitative Techniques in Geography	3	C	45	-
GEO 311	Field Course	3	C		135
	SIWES	18	C	24 Weeks	
GEO 312	Cartography	3	R	30	45
GEO 313	Geographic Information System I	3	R	45	-
GEO 314	Computer Application in Geography	2	R	30	45
GEO 315	Hydrology	2	R	30	-
GEO 316	Soil Studies I	3	R	30	45
GEO 317	Vegetation Studies I	2	R	30	-
GEO 318	Geography of Developed World	2	R	30	-
GEO 319	Land Surveying	3	R	45	-
GEO 320	Land/Terrain Evaluation	3	R	45	-
GEO 321	Remote Sensing I	3	R	45	45
GEO 322	Introduction to Medical/Health Geography	3	R	45	-
GEO 323	Climate Change	3	R	45	-
GST 311	Entrepreneurship	2	R	30	-
	Total	77			

Courses at 400 level Geography

Course Code	Courses Title	Units	Status	LH	PH
GEO 401	Systematic Geography of Nigeria	4	C	60	-
GEO 402	Contemporary Philosophy and Methodology in Geography	4	C	60	-
GEO 403	Research Methods II	3	C	45	-
GEO 404	Advanced Quantitative Techniques in Geography	3	C	45	-
GEO 405	Project/Dissertation	6	C	-	270
GEO 406	Advanced Cartography	3	R	30	45
GEO 407	Geography of Developing World	3	R	45	-
GEO 408	Tropical Geomorphology	3	R	45	-
GEO 409	Fluvial Geomorphology	3	R	45	-
GEO 410	Water Resources Management	3	R	45	-
GEO 411	Tropical Climatology	3	R	45	-
GEO 412	Applied Climatology	3	R	45	-
GEO 413	Soil Studies II	3	R	30	45
GEO 414	Vegetation Studies II	3	R	30	45
GEO 415	Demography	3	R	45	-
GEO 416	Urban Geography	3	R	45	-
GEO 417	Agricultural Geography	3	R	45	-
GEO 418	Locational Analysis	3	R	45	45
GEO 419	Transportation Geography	3	R	30	45
GEO 420	Rural Geography	3	R	45	-
GEO 421	Environmental Resources Management	3	R	45	-
GEO 422	Advanced Land Surveying	3	R	30	90
GEO 423	Advanced Remote Sensing	3	R	30	90
GEO 424	Geographic Information System II	3	R	30	90
GEO 425	Medical/Health Geography	3	R	45	-
	Total	80			

3.6.9 Synopses of Courses in Geography Degree Programme**GEO 101: Introduction to Elements of Physical Geography (4 Units: LH 60)**

The composition and structure of the lithosphere, atmosphere and hydrosphere. Nature, distribution, evolution and significance of the First Order Relief Forms of the earth. The earth's radiation, atmospheric and oceanic circulation systems. Introduction to the cycling of matter and energy in eco-systems.

GEO 102: Introduction to Elements of Human Geography (4 Units: LH 60)

The scope of human geography and its relation to physical geography. World population: its distribution and patterns of growth/demographic characteristics of selected populations. Human settlements: evolution; patterns and functions. Inter-relationships between urban and rural settlements. Environmental resources; the concept of resources: types of resources and their global distribution; relationship between resources and tertiary activities; impact of human activities on the environment at varying levels of

technology and population densities. The roles of movement and flows of people, goods, energy and ideas.

GEO 103: Introduction to Practical Geography (4 Units: LH 30, PH 90)

Map reading: location; map scale; conventional signs; representation of relief and recognition of relief forms; analysis and interpretation of relief forms on maps; analysis and interpretation of cultural features on maps. Graphical and map presentation of geographical data; isoline maps; chlorepleth maps; dot maps; flow maps; etc.

GEO 104: Local Field Studies (3 Units: PH 135)

Class field studies for familiarization of students with their local environments, and for practicalising classroom lectures in both human and physical geography.

GEO 105: Elementary Land Surveying (2 Units: LH 15, PH 45)

Introduction to Land Surveying types, Basic principles: Coordinate, Circumvention of obstacles, Erecting and Dropping of perpendicular lines, Instruments, Field Codes and Ethics, Open and Closed Traverse, Compass Survey: Booking and Plotting, Levelling etc.

GEO 106: Introduction to Environmental Sciences (3 Units: LH 45)

Energy systems in the atmosphere, biosphere, hydrosphere, and lithosphere. Current environmental issues, including climate change, air pollution and other natural hazards; erosion, drought, earthquakes, hurricanes, floods etc.

GEO 107: Introduction to Land Use Planning (2 Units: LH 30)

The need for land-use planning, methods for land-use planning, land-use determinants, integrated spatial solutions for problems on different scales, area-oriented integration of various tools for land-use planning, regional problems and environmental management. Agricultural land-use planning, urban land-use planning.

SOC 112: Introduction Social Anthropology (3 Units: LH 45)

Introduction to and survey of human origins and cultural achievements. Social Anthropology; historical, theoretical and methodological perspectives.

ECO 112/122: Economic Theory/Principles I & II (4 Units: LH 60)

An introduction to the various issues, the nature of economic science, the methodology of economics, major areas of specialization in economics, stressing historical development of ideas, major findings in the various areas of specialization, elementary principles of micro and macro-economics, current issues of interest and probable future developments.

GEO 201: Introductory Geomorphology and Soil Geography (2 Units: LH 30)

The meaning and scope of Geomorphology. Rock types, their origins and characteristics. Nature and origin of Second Order Relief Forms of the continents. Structural landforms. The meaning and scope of soil geography. Factors of soil formation. Zonal soils; azonal soils and intrazonal soils.

GEO 202: Introductory Climatology and Biogeography (2 Units: LH 30)

The general circulation of the atmosphere – scales and laws of motion. Forces that drive the atmosphere. Major features and models of the circulation, weather-producing

systems – air masses and fronts, frontal and non-frontal depressions; tropical systems. Climatic classifications and global systems of climate. Man's influence on the atmosphere. Basic structure and dynamics of plant communities, factors influencing plant growth. Survey of characteristics, distribution and controlling factors of principal or zonal vegetation types. Man's influence on vegetation.

GEO 203: Spatial Organisation of Society (3 Units: LH 30)

Some basic concepts of spatial organization: principles of classification of geographical phenomena; growth and special distribution of population. Production systems; typology and distribution; location, spacing and growth of settlements; movements over space and transport networks. Land-use; typology, patterns and interaction.

GEO 204: Map Analysis (3 Units: LH 30)

Reading, interpretation and analysis of geological and topographical maps. Analysis of the physical, human and cultural landscapes (drainage basin, relief settlement, communication, transportation etc)from maps

GEO 205: Elementary Land Surveying (3 Units: LH 30, PH 45)

Introduction to the theory of land surveying, Elementary land surveying methods, Chain surveying production of site plans.

GEO 206: Elementary Cartography (4 Units: LH 45, PH 45)

Fundamentals of Cartography (Cartography today, Nature of Cartography, History of Cartography, Cartographic, Visualization, Web Cartography, Graticules, Cartometry, Map Characteristics, Modern Trends). Earth (Earth-Map Relations, Basic Geodesy, Map Projections, Scale, Reference and Coordinate system, Transformation, Basic Transformation – Affine Transformation). Sources of Data (Sources of data – Ground Survey and Positioning, Remote Sensing data collection, Census and sampling, data Models for digital cartographic information, Map digitizing). Perception and Design (Cartographic design, Colour theory and models, Colour and pattern creation and specification, colour and pattern, Typography and lettering a map, Map compilation, Demography and Statistical mapping. Cartography Abstraction Selection and Generalization Principles, Symbolization, Topographic and thematic maps, Map production and Reproduction, Map series.

GEO 207: Introduction to Remote Sensing (3 Units: LH 30, PH 45)

Fundamentals of Remote Sensing (Definition, History of Remote Sensing, components of Remote Sensing, electromagnetic radiation), RS Process.

GEO 208: Introduction to Geographical Information Systems

(2 Units, LH 15, PH 45)

Remote Sensing systems, Imageries across the spectrum, Image Acquisition, Image Restoration and Enhancement, Image Processing and Interpretations, Image Storage and Retrieval Formats; applications in Agriculture, Environmental Resources Management, Monitoring and Change detection, Urban planning etc.

GEO 209: Field Study (3 Units: PH 135)

A detailed study of the geographical and geological forms and processes, the man and environment interactions, and the social and economic patterns as well the urban geography.

GEO 210: Elementary Statistics for Geographers (2Units: LH 30)

The place of statistics in Geography; Data description and characteristics; Discrete and continuous variables, Data Scales, Frequency distributions and graphical presentation; Measures of central tendency and variability. Methods of sampling; spatial sampling, description of point patterns; nearest neighbour analysis, etc.

GEO 211: Regional Geography for West Africa (2Units: LH 30)

Geography of West Africa, dealing with the peoples, their culture, history, systems of resources utilization, population patterns and processes, and spatial aspects of development.

GEO 212: Geographical Thought Theory (2Units: LH 30)

History of geography; Philosophical issues in Geography, history of development in America, Europe and Africa, Quantitative revolution; the role of theory in science and geography. Methods in natural and social sciences; Nature of problems in geographic research.

STA 203: Statistics for Physical Sciences and Engineering (3 Units: LH 45)

Measures of central tendency and dispersion (grouped and ungrouped): mean-arithmetic, geometric, median, mode, qualities, deciles and percentiles. Empirical relation between means, median, and mode relationship and absolute dispersion. Simple space and events as sets. Finite probability space; properties of probability statistical independence and conditional probability. Tree diagram. Bayes theorem. Discrete and continuous random variables. Expectation. Independent Bernoulli trials. Binomial distribution and normal distributions. Normal approximation to binomial and Poisson distributions. Hypergeometric.

ECO 214/224: Structure of the Nigerian Economy I & II (4 Units: LH 60)

Analysis of development in the pre-colonial and post-colonial periods with regard to the development of economic and social organizations, role of agriculture, industry monetization and banking, and international trade in Nigerian economic development. Growth of income, employment, wages and prices. Public development institutions, National income and expenditure. Monetary and fiscal policies. Monetary institutions. Trade and Transport systems, contributions of sectors of the Nigerian economy to national output, relationship between these sectors. Role of national institutions. Economic development and social change.

SOC 212: Social Change (2 Units: LH 30)

Theoretical perspectives; institutional analysis of the phenomenon of social change; concept of modernization, social change in Africa. Theories of social problems resulting from social change.

GEO 301: History of Geographical Thoughts (3 Units: LH 45)

History of Geographical thoughts in relation to science. The role of theory on science and Geography. Methods in natural and social sciences. The nature and problems in Geographical research. Course studies from Greek time up to the present. Frontier in contemporary Geographical thought.

GEO 302: Geomorphology (2 Units: LH 30)

Introduction: Subject-matter and scope of geomorphology: Aims and objectives of geomorphology. Developments in geomorphic thought; Approaches to geomorphological studies, Conceptual developments in geomorphology. Landforms, their formative Agents and processes; classification of landforms; volcanic and tectonic landforms, landforms of weathering and mass wasting, fluvial landforms, coastal landforms, Aeolian landforms, glacial landforms. Introduction to applied geomorphology.

GEO 303: Climatology (2 Units: LH 30)

Subject-matter and scope of climatology. Historical developments of meteorology and climatology. Physical climatology: Solar radiation, atmospheric temperature, atmospheric moisture, air masses, fronts and storms; winds and the global air circulation system. Regional climatology: classification of climates; examples of climate classificatory systems; climatic regions of the world.

GEO 304: Biogeography (2 Units: LH 30)

Principle and Concept of Biogeography. Vegetation types; factors affecting flora and fauna distribution at various scales. The concept of the ecosystem. The structure and functioning of terrestrial and aquatic ecosystems. Vegetation changes through time: adoption, succession and climax.

GEO 305: Population Geography (3 Units: LH 45)

Population data as vital statistics. Procedure and problems of population data collection including censuses. Historical outline of world population growth. Patterns of population distribution and trends of change. Theories and concepts of population. Determinants and spatial aspects of mortality, fertility and migration.

GEO 306: Economic Geography (2 Units: LH 30)

Supply and demand; factors of production; comparative advantage; economies of scale; economic rent and global trade and movements; etc.

GEO 307: Settlement Geography (2 Units: LH 30)

Concept of Settlement. Theories of settlement origin, distribution and growth factors and processes of settlements dynamics, Land-use evaluation and environmental habitats problems within regional settings.

GEO 308: Regional Geography of Africa (2 Units: LH 30)

Geography of Africa, dealing with the peoples, their culture, history, systems of resource utilization, population patterns and processes and spatial aspects of development.

GEO 309: Research Method I (2Units: LH 30)

Introduction to research methods in Geography: Selection of a research topic; definition of study problems and objectives; Formulation of research hypotheses; Experimental design for collection and analysis of data; writing a research proposal.

GEO 310: Quantitative Techniques in Geography. (3 Units: LH 450)

Introduction to descriptive and inferential statistics, parametric and non-parametric tests; Survey design and sampling strategies, Elementary statistical analysis of spatial patterns.

GEO 311: Field Course (3 Units: PH 135)

Eight to ten days intensive field studies designed to illustrate the application of theories, concepts and techniques of geographical analysis.

GEO 312: Cartography (3 Units: LH 30, PH 45)

Symbolization and map compilation, topographic and thematic cartography, cartographic design and presentation Basic draughtsmanship: conception, design and execution of map projections. Map interpretation and Air photo-interpretation. Computer Cartography,

GEO 313: Geographical Information System I (3Units: LH 45)

Introduction to GIS and the information age, Capabilities of GIS, Spatial data and their sources for GIS analysis, Raster and Vector data, Data Entry, GIS analysis and modelling data issues and problems.

GEO 314: Computer Application in Geography (2 Units: LH 15, PH 45)

Introduction to basic computing, overview of hardware and software systems. Emphasis is placed on the use of selected applications for storage, retrieval and analysis of geographical data; Use of the internet for geographical research.

GEO 315: Hydrology (2 Units: LH 30)

The course treats the various concepts and basic principles of hydrology. Field and laboratory techniques are introduced, consideration is given to the planning and organization of hydro-meteorological networks; methods of drainage basin instrumentation and observation, data processing, techniques of analysis and use of hydrological data.

GEO 316: Soil Studies I (3 Units: LH 30, PH 45)

Soil survey and land classification, tropical soil science including tropical weathering and laterites, sedentary and deposited parent materials, concept of soil distribution pattern, soil nutrients and fertilizers, management of land quality and its application to Nigerian soils.

GEO 317: Vegetation Studies I (2 Units: LH 30)

This course examines a spectrum of issues on vegetation studies including its aims, its scientific and practical importance, and various techniques of dating vegetation, vegetation classification, ordination, and analysis.

Included also in its scope are the studies of the nature of vegetation communities, the phenomenon of desertification, as well as a practical field exercise.

GEO 318: Geography of Developed Region (2 Units: LH 30)

Differentiation of the developed world from the developing world. Distribution of incomes and standards of living . Social, economic and political frameworks of the capitalization of centrally planned states. The historical evolution of the developed economies; Geographical basis of the economies of Western Europe, USA and USSR; growth and performance of agriculture, manufacturing and services; International trades and implications of the world economy.

GEO 319: Land Surveying (3 Units: LH 45)

In-depth practice of the methods of land surveying for Traversing, Leveling and Tacheometry. Angular measurements, distance measurements and Control Survey methodology. Using - Theodolite Surveying (Types, Description and uses, Temporary and Permanent adjustments of vernier transit, Horizontal angles vertical angles, Heights and distances Traversing, Closing error and distribution, Gale's tables, Omitted measurements, Laser attachment). Tacheometric Surveying (Tacheometric systems, Tangential, Stadia and Subtense methods, Stadia systems, Horizontal and inclined sights, vertical and normal staffing, fixed and movable hairs, stadia constants, Anallactic lens and Subtense bar).

GEO 320: Land/Terrain Evaluation (3 Units: LH 45)

Meaning and definition; need for terrain evaluation. Principles of terrain evaluation: the basic requirements of terrain evaluation system; the nature of terrain and its interpretation from maps, aerial photos and satellite images; principles of regional and terrain classification; general principles of genetic and landscape systems. Practical Systems of Terrain Evaluation: system for military purposes; systems used in soil science, agriculture, pasture, and forestry, terrain evaluation systems for civil engineering; landscape analysis in meteorology and climatology; terrain factors in hydrology, landscape resource analysis for landscape and recreational planning.

GEO 321: Remote Sensing I (3 Units: LH 30, PH 45)

Elements of remote sensing system, Techniques of remote sensing. Interpretation and analysis of Visual and Digital imageries. Remote sensing application, Integration of remote sensing and GIS in geographical research, case studies.

GEO 322: Introduction to Medical/Health Geography (3 Units: LH 45)

Definitions, scope and historical background of Medical/Health Geography. Geography of health and illness behaviour. Sources of data, problems associated data sources. Methodology in Medical/Health Geography. Ecology and models of diseases spread. Medical organizations and health care. Traditional and modern forms of health delivery. Public and private health policies in Nigeria.

GEO 323: Climate Change (3 Units: LH 45)

Climate change; environmental management implication of climate change with emphasis on Nigeria and West Africa; Global Strategies and the role(s) of institutions and organisations: WMO, UNEP, IPCC. Manifestations of climate change; vulnerability to climate change. Adaptation to climate change. Communicating climate change. Climate change versus environmental change.

SIWES

Students are supposed to get familiar with the major activities taking place in their places of attachment. Depending on the nature of their places of attachment, they are to participate in activities like map making, planning practices land, soil and water resources evaluation; human and socio-economic surveys, basic operation of field and laboratory equipment and facilities, practical and operational climatology, instrumentation in geography; and any other assignment given to them by their industrial based Head of Department. Report on the entire exercise/ experience.

GEO 401: Systematic Geography of Nigeria (4 Units: LH 60)

A thematic approach to the geography of Nigeria focusing on a range of physical and human phenomena: spatial patterns: ecological zones; growth and distribution of population; natural resources base; agricultural production and marketing systems; industrialization: transport development; internal and external exchange. Concepts and models; river basins; city and community regions; migration flows, urban systems; modernization; development strategies.

GEO 402: Contemporary Philosophy and Methodology in Geography (4 Units: LH 60)

Current methodology of geographical research, including: recent paradigm shifts within scientific approach to geographical research, quantification and classification in geography; theories and models in geography; systems analysis in geography.

GEO 403: Research Method II (3 Units: LH 45)

A Review of methodologies of Geographical Research, problem identification and selection of Research problem,. Area delineation of source of data, creation of research instruments, formal acquisition of data, appropriate statistical analyses, writing up of research finding and conclusion.

GEO 404: Advanced Quantitative Techniques in Geography (3 Units: LH 45)

Introduction to models and their testing, Advanced statistical techniques, Inferential Statistics; qualitative data analysis, spatial data analysis. Introduction to statistical behavioural models. Use of statistical software (SPSS, EPI INFO, MINITAB, STRATA, eVIEW etc) in analyzing Geographic data.

GEO 405: Project/Dissertation (6 Units: PH 270)

An individual study chosen by the students with the approval of the Department and carried out under the supervision of a senior member of staff. This will normally be started in the second semester of the third year. The final report of not more than 10,000 words in length should be submitted by the last week of second semester lectures in the fourth year.

GEO 406: Advanced Cartography (3 Units: LH 30, PH 45)

Advanced theories and methods in cartography, theory of colour, Digital cartography and map production using standard drafting and map point software production of automated maps.

GEO 407: Geography of Developing World (3 Units: LH 45)

The nature of underdevelopment in the Third World. Poverty and income distribution, production systems and links with the international economy. Geographical distribution of natural resources, human resources and technology. Development strategies: agriculture; industrialization, education, and manpower development. The population problem, international trade and transfer of resources.

GEO 408: Tropical Geomorphology (3 Units, LH 45)

Definition and climatic characteristics of the Tropics, climatic control on geomorphic processes and forms. Origin and development of Tropical Geomorphology; Tropical geomorphology as a branch of climatic geomorphology. Weathering processes and products. Denudation (Removal) processes in the tropical environments. The character

of the Tropical landscape: terrain characteristics; landforms of the tropics; types of tropical terrain; erosion surfaces in humid tropics; formation of erosion surfaces.

GEO 409: Fluvial Geomorphology (3 Units, LH 45)

Subject-matter and scope of fluvial geomorphology. Historical developments of fluvial geomorphology. The systems theory and approach. The fluvial system; basic fluvial geomorphic concepts; drainage network analysis. Fluvial geomorphology and climate: climatic geomorphology and the concept of climatomorphic regions; climatic control of fluvial forms and processes. Fluvial processes. The adjustment of channel forms: channel morphology. Channel changes through time.

GEO 410: Water Resources Management (3 Units, LH 45)

The unique properties and characteristics of water. The nature of water resources management. The physical aspects of water and water management: The water problem; global distribution of water; the need to manage the Earth's water resources. The global and basin hydrologic cycles. The societal uses of water resources. Approaches and methods for managing water resources. Water resources development and water supply. The economics of water resources management. Legal and political aspects of water resources management.

GEO 411: Tropical Climatology (3 Units, LH 45)

Definition and delimitation of the "Tropics" Rationale for studying the climatology of the tropics. Radiation conditions in the tropics. Temperatures in the tropics. Tropical precipitation. Tropical disturbances: Tropical weather systems. Applied tropical climatology: Tropical agroclimatology; tropical bioclimatology.

GEO 412: Applied Climatology (3 Units, LH 45)

This is a course of lectures on the practical implications and economic utilization of climatological information and knowledge in various aspects of life. The lectures will focus on: bioclimatology, agroclimatology, building climatology, rural and urban climatology, and climate change and its implications on humans and various human and economic activities.

GEO 413: Soil Science II (3 Units: LH 30, PH 45)

Soil survey and land classification, tropical soil science including tropical weathering and laterites, sedimentary and deposited parent materials, concept of soil distribution pattern, soil nutrients and fertilizers, management of land quality and its application to Nigerian soils.

GEO 414: Vegetation Studies II (3 Units: LH 30, PH 45)

This course examines a spectrum of issues on vegetation studies including its aims, its scientific and practical importance, various techniques of dating vegetation, vegetation classification, ordination, and analysis. This includes also in its scope of the study of the nature of vegetation communities, the phenomenon of desertification, as well as a practical field exercise.

GEO 415: Demography (3 Units: LH 45)

Definition of terms, Demographic Data Evaluation: assessment of demographic data, detection of errors in population census and vital registration data and methods of reducing these errors. Demographic Estimation: the use of the stable, stationary and

quasi-stable models in obtaining demographic parameters. Computation of fertility, mortality and migration. Methods of constructing life-tables. Population Projections, Population theories, Population trends and Policies.

GEO 416: Urban Geography (3 Units: LH 45)

The course focuses on the main themes of urban geography, the origin and growth of cities, urban systems, internal structures of cities, urban ecology, movement in the urban environment, urban problems/planning in Nigeria.

GEO 417: Agricultural Geography (3 Units: LH 45)

Classical agricultural location models, market system models, probability and behaviour models of agricultural activity, agricultural typology. Case studies and group projects.

GEO 418: Locational Analysis (3 Units: LH 30, PH 45)

Theories of locations (Faunard, Weber, Losch, Hoover and Isard), Approaches to the location theory, spatial and equilibrium approaches, industries locations, cost factors in location (Transport, labour, energy, taxes and subsidies, land, internal scale) demand analysis and spatial location decision making.

GEO 419: Transportation Geography (3 Units: LH 30, PH 45)

Why things move, movement geometry, analysis of networks and flows, network performance, movements, transportation and transportation gaps, kinds and patterns of trade flows.

GEO 420: Rural Geography (3 Units: LH 45)

Spatial organization in rural areas, integration of farming production units and service nodes, rural industries, non agricultural employment and population processes of rural development, urban influences.

GEO 421: Environmental and Resources Management (3 Units: LH 45)

This course aims at increasing students' awareness with respect to global, regional, and national environmental issues, especially as related to the Nigerian situation. Its main objective is to demonstrate the tripartite relationship that links human population, resource exploitation and the state of the environment. Environmental Impact Assessment (EIA) is a major topic covered in this course. The main focus of the course is on examining the various resource and environmental development and management strategies and approaches currently adopted with an aim of maintaining environmental quality; Environmental resources protection and conservation; Sustainable Development; Climate Change.

GEO 422: Advanced Land Surveying (3 Units: LH 30, PH 90)

Advanced theories and methods in Land surveying, photogrammetry, contouring, subdivisions and cadastral layouts., Computation of areas and volumes. Use of Global Positioning Systems. (GPS)

GEO 423: Advanced Remote Sensing (3 Units: LH 30, PH 90)

Remote Sensing analytic digital image processing system. Fundamentals (Computers imaging systems, image representation- colour space, image sampling quantization, quality measurement, data products, storage and retrieval- Photowite systems, dip systems and software. Preprocessing (Encoding and decoding, sources of image

degradation, atmospheric, radiometric and geometric errors, systematic and non-systematic correction, image geometry operations. Image Enhancement (Image characters, histogram, scatter plots, statistics and spatial statistics for processing, image models, spatial transforms, enhancements: radiometric and geometric operators, Fourier transforms, scale space transforms, image fusion, texture analysis. Image Classification (Spectral discrimination pattern matching Baye's theorem- signature and feature extraction- training and classification, supervised and unsupervised methods error matrix and accuracy estimates. Image Analysis (Concept of uncertainty, fuzzy partitioning, neural nets, sub-pixel classification concept, pattern recognition, feature descriptors). Remote sensing application, Integration of Remote Sensing and GIS in geographical research, case studies.

GEO 424: Geographic Information System II (3 Units: LH 30, PH 90)

Introduction to Spatial Database Management Systems. Introduction (Data, Information, File system vs DBMS, Data models, Hardware and software requirements, Database Management Systems, Database languages, Database Architecture, users and administrators, Classification of Database Management Systems. Relational Data Model (Relational model, Data Structure, Constraints, Key, Codd's Rule, Relational Algebra, Fundamental operations, Additional operations, Extended operations Null values. SQL (SQL, Data Definition, Basic structure of SQL queries, Set operations, Aggregate, Functions, Null values, Nested sub queries, Complex queries, Views, Embedded SQL, Dynamic SQL, Triggers. Database Design And Management (Design process, Entity Relationship Model, Constraints, EER, Diagrams, Atomic domain and First Normal Form, Functional Dependency, Decomposition using Functional dependencies, Normalization using Multi-Valued Dependencies and Join Dependencies, Basic concepts of file organizations, indexing and hashing, Database recovery techniques, Database Security, Handling Spatial Database. Accessing Data Using Ado.Net And Vb.Net (ADO.Net Object Model using OLE DB managed provider, Other data providers, Accessing XML data, Building Windows)

GEO 425: Medical / Health Geography (3 Units: LH 45)

This course examines the geography of infectious and acute diseases, including the impact of diseases on populations, taxonomy and structure of disease agents, modes of transmission, infectivity, pathogenicity, virulence, incubation, and surveillance methods. Topics include diarrheal diseases, viral hepatitis, Sexually Transmitted Diseases/Infaction, HIV/AIDS, and airborne and vector-borne organisms. Environmental sanitation and prevention of diseases. Health belief, behavioural risks and social models. Individual/group case study project. Designing and carrying out population health survey.

3.7 INDUSTRIAL DESIGN DEGREE PROGRAMME

3.7.1 Introduction

The general thinking behind academic training in Industrial Design is to produce competent skilled and creative individuals capable of upholding, sustaining, and linking educational experiences to the values and needs of the Nigerian society

The programme is aimed at exploiting the rich cultural and traditional design and production processes in Nigeria. Specifically, the industrial design programme will normally seek to among other things:

3.7.2 Aims and Objectives

The Aims and Objectives of the programmes are:

- To produce designers capable of understanding and solving complex problems in the field of industrial design
- To train competent graduates in Industrial Design knowledge processes skills and their techniques and technology and management
- In addition, the programme should be able to promote adequate general knowledge and specified skills and techniques.
- To enhance the effective performance of graduate designers to use technological methods, techniques skills and material involved in Industrial Design for economic and human needs.

3.7.3 Programme Duration

The duration of the industrial design degree programme is for a minimum of ten semesters. One full semester will normally be devoted to industrial training (SIWES).

3.7.4 Admission Requirements

Candidates may enrol for a degree programme in industrial design with one of three terminal qualifications in view: B.Tech. Industrial Design, B.Sc. Industrial Design or B.Sc. Glass Technology. Three modes of admission are available for candidates seeking a degree in industrial design. These include:

UTME Admission:

B.Tech. Industrial Design

Candidates must have 5 credits passes at SSCE or equivalent in not more than two sittings in the relevant subject areas including English Language and mathematics. At least a pass grade in Chemistry and Physics will also be required.

B.Sc. Industrial Design

Candidates wishing to pursue B.Sc. Degree in Industrial Design must obtain at least 5 credits at SSCE or its equivalent, 3 of the subjects must be Art, English Language and mathematics.

B.Sc. Industrial Design (Glass Technology)

Candidates majoring in Glass Design and Technology must obtain at least 5 credits at SSCE or its equivalent. The credit passes will include English Language, Chemistry, mathematics or Physics. Credit in Fine Art will be an advantage.

Direct Entry Admission

B. Tech. Industrial Design

Candidates seeking direct entry admission to 200 level, in addition to UTME requirements above, must obtain advanced level A/L pass or its equivalent such as OND and ND upper credit. The course taken at this level must include Art, and Chemistry.

B.Sc. Industrial Design

For 200 level, candidate in addition to UTME requirements above, must obtain advanced level (A/L) pass or its equivalent such as NCE OND, and ND etc. the courses taken at this level must include Art.

B.Sc. Glass Design and Technology

For 200 level, candidates must in addition to UTME requirements above, obtain advanced level (A/L) pass or its equivalent at NCE, OND, the courses taken at this level must include chemistry, mathematics or physics.

3.7.5 Resource Requirement for Teaching and Learning

a) Academic Staff

This should be in the ratio of one academic staff to eight students, where a department has up to six areas of specialization each area should have at least two lecturers at the senior category. This number should be increased where there are postgraduate programmes.

In order to prevent the practice of indigenous arts and crafts from becoming extinct; traditional craftsmen should be invited to the university for short periods as Artist-in-Residence. It is expected that this will enable them to transfer their skills to younger generation.

3.7.6 Courses for Industrial Design Degree Programme

Courses at 100 level Industrial Design

100-LEVEL INDUSTRIAL DESIGN					
Course Code	Course Title	Units	Status	LH	PH
IDD121	General Drawing I	2	C	-	90
IDD122	General Drawing II	2	C	-	90
IDD151	Art Appreciation I	2	C	30	-
IDD152	Art Appreciation II	2	C	30	-
IDD131	Basic Design I	3	C	-	135
IDD132	Basic Design II	3	C	-	135
GST 111	Communication in English I	2	C	30	-
GST 112	Logic, Philosophy and Human Existence	2	R	30	-
GST 113	Nigerian Peoples and Culture	2	R	30	-
GST 121	Use of Library, Study Skills and ICT	2	C	30	-
GST 122	Communication in English II	2	C	30	-
CHM 101	General Chemistry I	3	C	45	
CHM 102	General Chemistry II	3	E	45	

Please, forward your comment on any section of this document to the following email:

nucassessment@gmail.com

You can also call the following phone numbers: 08033145087, 08033201097

All comments should be received before 31st October, 2015

CHM 107	General Chemistry I (Practical)	1	C	-	45
CHM 108	General Chemistry II (Practical)	1	E	-	45
MTH 101	Elementary Mathematics I	3	C	45	-
MTH 102	Elementary Mathematics II	3	E	45	-
SOC101	Introduction to Sociology	4	R	60	-
ARC112	Introduction to Architecture II	2	R	30	-
GEO 121	Introduction to Physical Geography	4	R	60	-
ARC 161	Introduction to Environment Science	2	R	30	-
	Total	50			

Courses at 200 level Industrial Design

200-LEVEL INDUSTRIAL DESIGN					
Course Code	Course Title	Units	Status	LH	PH
IDD201	2-Dimensional Design	3	C	-	135
IDD211	General Drawing III	2	C	-	90
IDD214	General Drawing IV	2	C	-	90
IDD213	History Design I	2	C	30	-
IDD216	History Design II	2	C	30	-
IDD217	Material Science I	2	C	30	-
IDD 232	Material Science II	2	C	30	-
IDD235	Art and Visual Appreciation	2	C	30	-
GST 211	Environment and Sustainable Development	2	R	30	-
GST 222	Peace and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
IDD234	Computer Applications to Technology Design	2	C	-	90
IDD212	3-Dimensional Design	3	R	-	135
CCS201	Computer Appreciation I	2	R	-	90
CCS202	Computer Appreciation II	2	R	-	90
ARC233	Environmental Education and awareness	2	R	30	-
IDD251	Introduction to Textile and Fashion Design	4	R		180
IDD253	Introduction to Sculpture	4	R	-	180
IDD238	Introduction to Metal Design	4	R	-	180
IDD242	Introduction Painting	2	R	-	90
IDD246	Technical Drawing	2	R	-	90
IDD248	Photography	2	R	-	90
IDD252	Introduction to Graphic Design	2	R	-	90
	Total	54			

Courses at 300 level Industrial Design (Ceramics option)

300-LEVEL INDUSTRIAL DESIGN (CERAMICS OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD301	Basic Throwing I	3	C	-	135
IDD302	Basic Throwing II	3	C	-	135
IDD303	Hand Building I	3	C	-	135
IDD304	Hand Building II	3	C	-	135
IDD305	Wheel Throwing I	2	C	-	90
IDD306	Theory of Ceramics Technology I	3	C	45	-
IDD307	Theory of Ceramics Technology II	3	C	45	-
IDD309	Contemporary Methods and Materials	2	C	30	-
IDD321	Drawing I	2	R	-	90
IDD322	Drawing II	3	R	-	135
IDD310	Decorating Unified Body	2	C	-	90
IDD311	Architectural Ceramics I	2	C	-	90
IDD312	Architectural Ceramics II	2	C	-	90
IDD315	Ceramics Sculpture I	2	C	-	90
IDD316	Ceramics Sculpture II	2	C	-	90
IDD318	Photography	3	R	-	135
IDD319	Texture Surface Designing	2	R	-	90
IDD320	Methods of Firing	2	R	-	90
ARC319	Technical Drawing	2	R	-	90
ARC361	Housing and Interior Decoration	2	R	-	90
GST 311	Entrepreneurship	2	R	30	-
	Total	50			

Courses at 400 level Industrial Design (Ceramics option)

400-LEVEL INDUSTRIAL DESIGN (CERAMICS OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD401	Drawing	2	C	-	90
IDD403	Theory of Ceramics Tech 111	3	C	45	-
IDD405	Ceramics Screen Printing	2	C	-	90
IDD407	Product Design	3	C	-	135
IDD409	Kiln Design and Building	3	C	45	-
IDD411	Research Methods and Techniques	2	R	30	-
IDD413	Special Project1	3	C	-	135
IDD422	Casting Techniques 11	2	C	30	-
IDD424	Special Product	3	C	-	135
IDD426	Law of Contract	2	R	30	-
IDD499	Project dissertation	3	C	45	-
IDD442	Management, Marketing and Exhibition	3	R	45	-

IDD415	Principles and Issues of Design in w/Africa	2	C	30	-
IDD430	Mosaics and wall Decoration	2	C	-	90
ARC417	Landscape Design	2	R	-	90
	Total	37			

Courses at 300 level Industrial Design (Fashion Design Option)

300-LEVEL INDUSTRIAL DESIGN (FASHION DESIGN OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD331	Fashion Drawing I	3	C	-	135
IDD332	Fashion Drawing II	3	C	-	135
IDD333	Methods and Materials I	3	C	45	-
IDD334	Methods and Materials II	3	C	45	-
IDD335	Introduction to Textiles	3	C	-	135
IDD336	Pattern Making	2	C	-	90
IDD337	Clothing Construction Techniques I	3	C	-	-
IDD339	Clothing Construction Techniques II	3	C	-	-
IDD323	Fashion Design I	3	C	-	135
IDD324	Fashion Design II	3	C	-	135
IDD325	History of Fashion	2	C	30	-
IDD340	Principles and issues in Fashion Design	3	R	45	-
IDD341	History of African Design	2	R	30	-
IDD342	Art Education I	2	C	30	-
IDD343	Art Education II	2	C	30	-
IDD345	Mosaic and Wall Decoration	2	R	-	90
IDD319	Texture Surface Designing	2	R	-	90
IDD320	Methods of Firing	2	R	30	-
ARC361	Housing and Interior Decoration	2	R	-	90
SOC302	Sociology of industry	3	R	45	-
GST 311	Entrepreneurship	2	R	30	-
	TOTAL	53			

Courses at 400 level Industrial Design (Fashion Design Option)

400-LEVEL INDUSTRIAL DESIGN (FASHION DESIGN OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD401	Drawing	2	C	-	90
IDD421	Interior Decoration	2	C	-	90
IDD423	Fashion Design III	3	C	-	135
IDD437	Fashion Drawing I	3	C	-	135
IDD439	Recent Development in Clothing and Textiles	2	C	30	-
IDD411	Research Methods and Techniques	3	C	45	-

IDD413	Special Project I	3	C	-	135
IDD433	Fashion Merchandising	2	R	30	-
IDD424	Special Product	3	C	-	135
IDD425	Fashion Industry	2	R	30	-
IDD426	Law of Contract	2	R	30	-
IDD499	Project dissertation	3	C	45	-
IDD442	Management, Marketing and Exhibition	3	C	45	-
IDD415	Principles and Issues of Design in West Africa	2	R	30	-
IDD435	Mosaics and wall Decoration	2	R	-	90
ARC417	Landscape Design	2	R	-	90
SOC408	Sociology of Development	2	R	30	-
	Total	41			

Courses at 300 level Industrial Design (Graphic Option)

300-LEVEL INDUSTRIAL DESIGN (GRAPHIC OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD351	Graphic Drawing I	2	C	-	90
IDD352	Graphic Drawing II	2	C	-	90
IDD353	Illustration I	2	C	-	90
IDD354	Illustration II	2	C	-	90
IDD355	Advertisement Design System and Methods I	3	C	45	-
IDD356	Advertisement Design System and Methods II	3	C	45	-
IDD357	Photography I	3	C	-	135
IDD358	Photography II	3	C	-	135
IDD346	Introduction to Computer Graphics	2	R	-	135
IDD347	Methods and Materials in Graphics I	3	R	45	-
IDD348	Methods and Materials in Graphics I	3	R	45	-
IDD349	Typography and General Printing Process	3	C	30	-
ARC322	Technical Drawing	2	C	-	90
IDD341	History of African Design	2	C	30	-
IDD342	Art Education I	2	C	30	-
IDD345	Art Education II	2	C	30	-
IDD346	Mosaic and Wall Decoration	2	R	-	90
IDD319	Texture Surface Designing	2	R	-	90
IDD320	Methods of Firing	2	R	-	90
ARC361	Housing and Interior Decoration	2	R	-	90
SOC302	Sociology of industry	3	R	30	-
GST 311	Entrepreneurship	2	R	30	-
	Total	52			

Courses at 400 level Industrial Design (Graphic Option)

400-LEVEL INDUSTRIAL DESIGN (GRAPHIC OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD401	Drawing	2	C	-	90
IDD451	Scenic Design, Caption and Story Board	2	C	-	90
IDD452	Editorial Graphics and Press Advert	4	C	-	180
IDD453	Outdoor Advertising Graphics	2	C	-	90
IDD454	T.V Graphics and Animation	3	C	-	135
IDD456	Reprography	3	C	-	135
IDD411	Research Methods and Techniques	3	R	45	-
IDD413	Special Project I	3	C	-	135
IDD457	Package Design and Production	3	C	-	135
IDD426	Law of Contract	2	R	-	90
IDD499	Project dissertation	3	C	45	-
IDD442	Management, Marketing and Exhibition	3	R	45	-
IDD415	Principles and Issues of Design in w/Africa	2	C	30	-
IDD458	Clothe Figure Drawing	2	C	-	90
ARC417	Landscape Design	2	R	-	90
SOC408	Sociology of Development	2	R	30	-
	Total	41			

Courses at 300 level Industrial Design (Textile Option)

300-LEVEL INDUSTRIAL DESIGN (TEXTILE OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD321	Drawing I	2	C	-	90
IDD322	Drawing II	2	C	-	90
IDD361	Textiles Design I	3	C	-	135
IDD362	Textiles Design II	3	C	-	135
IDD363	Dyed and Printed Textiles I	3	C	-	135
IDD364	Dyed and Printed Textiles II	3	C	-	135
IDD365	Woven and Constructed Textures I	3	C	30	45
IDD366	Woven and Constructed Textures II	3	C	30	45
IDD367	Methods and Materials in Textile I	3	C	45	-
IDD369	Methods and Materials in Textile II	3	C	45	-
IDD370	Computer Application in Textile Design	2	R	30	-
IDD325	History of fashion	2	R	30	-
IDD341	History of African Design	2	C	30	-
IDD342	Art Education I	2	C	30	-
IDD345	Art Education II	2	C	30	-
IDD346	Mosaic and Wall Decoration	2	R	-	90
IDD319	Texture Surface Designing	2	R	-	90

IDD320	Methods of Firing	2	R	30	-
ARC361	Housing and Interior Decoration	2	R	-	90
SOC302	Sociology of industry	3	R	45	-
SOC304	Rural Sociology	2	R	30	-
GST 311	Entrepreneurship	2	R	30	-
	Total	53			

Courses at 400 level Industrial Design (Textile Option)

400-LEVEL INDUSTRIAL DESIGN (TEXTILE OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD461	Textile Design III	3	C	-	135
IDD462	Dyed and Printed Textiles III	3	C	-	135
IDD463	Woven and Constructed Textile III	3	C	-	135
IDD464	Creative Textiles	3	C	-	135
IDD465	Computer application in Textiles	3	R	-	135
IDD466	Textile industry	2	C	30	-
IDD411	Research Methods and Techniques	3	R	45	-
IDD413	Special Project I	3	C	-	135
IDD426	Law of Contract	2	R	30	-
IDD499	Project dissertation	3	C	5	
IDD442	Management, Marketing and Exhibition	3	C	45	-
IDD415	Principles and Issues of Design in w/Africa	2	C	30	-
IDD468	Clothe Figure Drawing	2	C	-	90
ARC417	Landscape Design	2	R	-	90
SOC408	Sociology of Development	2	R	30	-
	Total	39			

Courses at 300 level Industrial Design (Glass design and Technology Option)

300-LEVEL INDUSTRIAL DESIGN (GLASS DESIGN AND TECHNOLOGY OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD371	Introduction to properties and application of glass	3	C	-	135
IDD372	Glass Melting Furnace	3	C	-	135
IDD373	Batch calculation Methods	2	R	30	-
IDD374	Techniques of Free blowing	2	C	-	90
IDD375	Principles of Glass Table Wave Designing	2	C	-	90
IDD376	History of Glass Designs	2	R	30	-
IDD377	Properties and application of glass	2	C	30	-
IDD378	Refractories, Fuels and fuel Economics	3	C	45	-
IDD379	Techniques of Casting and Flame making	3	C	-	135

IDD380	Glass preparation process	2	C	-	90
IDD381	Glass Mosaic in studio glass working	2	C	-	90
IDD382	Textured Surface Design in Glass	2	C	-	90
IDD383	Product Design	2	C	-	90
ENG 302	Engineering Drawing	2	R	-	90
IDD341	History of African Design	2	R	30	-
IDD342	Art Education I	2	R	30	-
IDD345	Art Education II	2	R	30	-
IDD346	Mosaic and Wall Decoration	2	R	-	90
IDD319	Texture Surface Designing	2	R	-	90
IDD384	Technology and Social Change	2	R	30	-
IDD318	Photography	3	R	-	135
GST 311	Entrepreneurship	2	R	30	-
TOTAL		49			

Courses at 400 level Industrial Design (Glass design and Technology Option)

400-LEVEL INDUSTRIAL DESIGN (GLASS DESIGN AND TECHNOLOGY OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD471	Industrial Flat Glass Manufacturing Process	3	C	-	135
IDD472	Thermal Compositional and Structural Effects	2	C	-	90
IDD473	Primary Sensors for Glass Industry	2	C	-	90
IDD474	Lamination Techniques	2	C	-	90
IDD475	Advanced Technical Drawing (Glass Furnace)	2	C	-	90
IDD476	Glass Blowing, Casting and Flame Working	3	C	-	135
IDD411	Research Methods and Techniques	3	R	45	-
IDD426	Law of Contract	2	R	30	-
IDD499	Project dissertation	3	C	45	-
IDD442	Management, Marketing and Exhibition	3	R	45	-
IDD415	Principles and Issues of Design in w/Africa	2	C	30	-
IDD468	Clothe Figure Drawing	2	C	-	90
ARC417	Landscape Design	2	R	-	90
SOC408	Sociology of Development	2	R	30	-
THA415	Drama Costume and Make up Design	2	R	30	-
TOTAL		35			

Courses at 300 level Industrial Design (Metal design Option)

300-LEVEL INDUSTRIAL DESIGN (METAL DESIGN OPTION)					
Course Code	Title	Units	Status	LH	PH
IDD391	Jewellery I	3	C	-	135
IDD392	Jewellery II	3	C	-	135
IDD393	Metal Smithing I	3	C	-	135
IDD394	Metal Smithing II	3	C	-	135
IDD395	Theory of Metals I	3	C	45	-
IDD396	Theory of Metals II	3	C	45	-
IDD397	Metal Designing I	3	C	-	135
IDD398	Metal Designing II	3	C	-	135
IDD385	Foundry Practice I	3	C	45	-
IDD386	Foundry Practice II	3	C	45	-
IDD387	Drawing I	2	R	-	90
IDD388	Drawing II	2	R	-	90
IDD341	History of African Design	2	R	30	-
IDD342	Art Education I	2	C	30	-
IDD345	Art Education II	2	C	30	-
IDD346	Mosaic and Wall Decoration	2	R	-	90
IDD319	Texture Surface Designing	2	R	-	90
SCO308	Rural Sociology	2	R	30	-
GST 311	Entrepreneurship	2	R	30	-
TOTAL		48			

Courses at 400 level Industrial Design (Metal design Option)

400-LEVEL INDUSTRIAL DESIGN (METAL DESIGN OPTION)					
Course Code	Course Title	Units	Status	LH	PH
IDD401	Drawing	2	C	-	90
IDD481	Jewellery III	3	C	-	135
IDD482	Metal Smithing III	3	C	-	135
IDD483	Theory of Metals III	3	C	-	135
IDD484	Computer Application in Metal Design	2	C	-	90
IDD485	Traditional Forging Techniques	3	C	-	135
IDD413	Special Project I	3	C	-	135
IDD411	Research Methods and Techniques	3	R	45	-
IDD426	Law of Contract	2	R	30	-
IDD499	Project dissertation	3	C	45	-
IDD428	Special Project II	3	C	45	-
IDD442	Management, Marketing and Exhibition	3	C	45	-
IDD415	Principles and Issues of Design in W/Africa	2	R	30	-
IDD468	Clothe Figure Drawing	2	C	-	90
ARC417	Landscape Design	2	R	-	90

THA415	Drama Costume and Make up Design	2	R	-	90
SOC408	Sociology of Development	2	R	30	-
TOTAL		43			

3.7.7 Synopses of Courses in Industrial Design Degree Programmes

THA 103: Beginning Theatre Design and Technology (2 Units: LH 30)

A study of how to relate scene design to text in actual production by focusing on the factors that control design procedures for the varying media.

IDD 121: General Drawing I (2 Units: PH 60)

Introduction to basic problems in the observation and interpretation of forms with concern for space, time, shapes, form and composition.

IDD 122: General Drawing II (2 Units: PH 60)

Studies in the basic problems in the observation and interpretation of form using variety of media and subject matter.

IDD 151/152: Art Appreciation I and II (4 Units: LH 60)

Development of visual literacy through analysis of works of art; Principles of art; forms; meaning; context and significance; Aesthetic analysis.

IDD 131/132: Basic Design I and II (6 Units: PH 180)

General introduction to basic tools, materials and techniques used in ceramics, fashion design, graphics, textiles, glass design and technology and metal design. It serves as a foundation course that involves the practical exploration of the language and grammar of design at both two and three dimensional level.

IDD 201: 2-Dimensional Design (2 Units: PH 135)

Treatment and use of various surface for design purposes; Presentation of surface decoration; Balance compositional balance; pictorial unity, and harmonies of contrasts. Introduction to nature of colours; Exercises from still-life and simple objects and original imaginative composition. Uses and care of materials.

IDD 213/216: History of Design I and II (4 Units: LH 60)

Pre – historic design in Africa (North, West, East and South Africa). Concept of design in Africa discussed, 16th – 19th centuries History of Art and Design in Africa, Europe and America; schools of thought on Design; lectures, tutorials and library investigations. Surface and structured decoration in Nigeria design with references to ceramics, textiles, graphics, fashion design, glass, metal work, Jewellery and twill weave sampler.

IDD 217: Material Science I (2 Units: LH 30)

Focus on conventional materials for ceramics, graphics, textiles, fashion design, glass and metal design; studio equipment, techniques and analytical survey of materials e.g. Composition strength and types of uses.

IDD 232: Materials Science II (2 Units: LH 30)

New materials for ceramics, textiles, graphics, fashion design, glass and metal design polyester and fibre glass, P.V>C (vine mould) and other thermoplastic materials; equipment and machines, chemicals, release and parting agents, finishing pastes and polishes.

IDD 212: 3-Dimensional Design (3 Units: PH 135)

Elements and principles of 3 dimensional concepts of Arts and design; Individual skills development; creative problem solving projects in 3 dimensional concepts; Introduction to studio areas; use of space in 3 dimensional forms; special projects for individual needs obtaining and using materials from local sources.

IDD 251: Introduction to Textiles and Fashion Design (4 Units: PH 180)

Introduction to the tools and materials of textile manufacture and textile design; Equipment of textile manufacture; textile designs, repeating and non-repeating designs colour; line theory, form plane, etc. History, development and marketing of textiles, use of textiles; Relationship between textiles and fashions; fashion vocabulary (style, mode, vogue, culture, fad, etc); A look at careers and opportunities in the fields.

IDD 252: Introduction to Graphic Design (2 Units: PH 90)

Practical exploration of language and grammar of design at both two and three dimensional levels; Basic topography, layout rendering, the organization of verbal and non-verbal elements of design, theoretical design principle.

IDD 238: Introduction to Metal Design (4 Units: PH 180)

General introduction to metals and the technology of fine metal works.

CERAMICS OPTION

IDD 303: Hand Building I (3 Units: PH 135)

Clay work and slab construction of geometric and other forms. Coil building on wheeler; exploring pinched methods and globular shapes. Different aspects of decorations; embossing dyes and rollers.

IDD 304: Hand Building II (3 Units: PH 135)

Further coil and slab building; combining various forms for utility and aesthetic considerations; Modeling planters and use of various decorative techniques; Moulding over forms of natural objects.

IDD 305: Wheel Throwing (2 Units: PH 90)

Introduction to the various types of wheels (kick, electronic, cone and belt driven and hand turning wheels), Clay preparation for throwing starting with cylinders as simple open bowls. Concepts of designing in pottery and ceramics. Creating thrown forms from sketches; the use of granular materials in throwing clay; Techniques of functional design decoration created from tool marks and natural objects; slip and enrobe decorations on tableware (casseroles to wine beakers); Techniques of making handles.

IDD 301/302: Basic Throwing I & II (6 Units: PH 270)

This course provides students with experience on potters' wheel to work towards production. It further provides ability in the improvisation of and use of common tools

and materials which would be of service in a pottery studio e.g. wood rib, rigid and flexible (inside and outside) tool, modelling tools, rouletten, etc.

IDD 306: Theory of Ceramic Technology I (3 Units: LH 45)

Kinds of clays and their characteristics with regards to chemical composition and physical properties; Non-plastic ceramic materials; Quartz inversion and thermal expansion; Tri-axial blending in body composition; Glaze composition with silica as the basis of glass and the glass distinction.

IDD 307: Theory of Ceramic Technology II (3 Units: LH 45)

Early types of glaze; Egyptian glazes and the early lead glazes Egyptian paste; Ash, slip, Feldspar and salt glazes. The oxides and their functions in glazes; Other raw materials from antimony oxide to zirconium oxide in glaze development.

IDD 315: Ceramic Sculpture I (2 Units: PH 90)

Introduction to ceramics sculpture; the techniques of clay modelling; Clay preparation and introduction to the various tools; the creation of clay works (terracotta) based on human and animal forms.

IDD 316: Ceramic Sculpture II (2 Units: PH 90)

Work involving the use of life models; Techniques of portraiture, male or female; Plaster preparation; types of moulds; outdoor ceramic sculpture.

IDD 311: Architectural Ceramic I (2 Units: PH 90)

Art works incorporating the techniques of ceramic sculpture and architecture; Decorative techniques involving bricks and tiles (sanitary ware, lamp bases and shades).

IDD 312: Architectural Ceramic II (2 Units: PH 90)

Designing outdoor ceramic stools and indoor sanitary ware; Fountains with ceramic mural decoration.

IDD 309: Contemporary Methods and Materials in Ceramics (2 Units: PH 90)

The achievement to Nigerian cultural needs in ceramics, a critical approach to produce sculptural ceramics to highlight this aspect in practical terms, e.g. costumes, head gear, traditional stools, royal staffs, etc.

IDD 310: Decorating Unfired Body (2 Units: PH 90)

Methods of decorating green wares produced by them during their throwing exercise and sculptural works. For example, incise and spring-on moist clay, dry carve slip painting with the use of brush and tracing. The use of engobe and graffite decoration, etc.

IDD 422: Casting Techniques (2 Units: LH 30)

This is strictly designed for students with knowledge in industrial slip casting techniques. Preparation of two-piece or multiple moulds. Defloculation and flocculation of clay. Students will be encouraged to initiate projects, which center on one area of slip casting towards mass production.

IDD 442: Management, Marketing and Exhibition (3 Units: LH 45)

Organisation and Management of studio pottery; use of equipment and how to manage and repair them. Highlight of the role of the designer in the development of Educational

and trade shows exhibition. Marketing strategy in the design of effective 3-D environments. Space planning, lighting audio-visual presentations, and materials are explored.

IDD 403: Theory of Ceramic Technology III (3 Units: LH 45)

Concepts and principles involving simple glaze calculations. The study of raw materials table, their molecular and atomic weights and various feldspar formulae.

Concepts and principles involving complex glaze calculations (from batches or recipes, to formulae). Calculation of the batch from the formula. Practical problems in glazes. The composition of glazes experimenting with local materials. Sources of colours in flows and their remedies.

IDD 409: Kiln Design and Building (3 Units: LH 45)

The development of early kilns. Principles of kiln design. Refractory materials and their usage. Practical aspects of kiln construction.

The various types of kiln including wood-fired kiln. Factors affecting the usage and construction of kilns. The techniques of packing and firing. Individual or group assignment involving kiln building and designing.

IDD 413: Special Project I (3 Units: PH 135)

A practical project based on the student's cumulative experiences in ceramic art. Work could be based on any aspect of ceramic art, namely, ceramic sculpture, murals etc. and attempts in the construction of simple ceramic equipment.

FASHION DESIGN OPTION

IDD 331: Fashion Design I (3 Units: PH 135)

Style development, garment design and presentation. Croquis.

IDD 332: Fashion Design II (3 Units: PH 135)

Designing, executing original pattern. Emphasis on innovation in African fashion.

IDD 325: History of Fashion (2 Units: LH 30)

History of costume from primitive to modern Evaluation of styles. Roles of designers. Sociological and psychological aspects of clothing. West Africa Fashions. Study of designers, manufacturers, retailers, buying officers, traders, shops, boutiques, etc. National and International advertising media.

IDD 333/334: Methods and Materials I and II (6 Units: LH 270)

A study of the theoretical aspects of the sewing machine and its practical use. The course will cover the study of machine parts and their individual functions. It is aimed at helping students in using the major equipment accurately.

IDD 335: Introduction to Textiles (3 Units: PH 135)

Introduction to the various aspects in designing for textiles. Application of specific reproduction techniques in textiles.

IDD 336: Pattern Making (2 Units: PH 90)

Fundamental principles of pattern making.

IDD 337: Clothing Construction Techniques (3 Units: LH 15, PH 90)

Process, methods and materials of clothing construction.

IDD 421: Interior Decoration (2 Units: PH 90)

Advanced furnishing will entail a consideration of interior design with a focus on construction, space, form and arrangement of furniture and other furnishing accessories. Aesthetic, economic, social consideration in interior designs.

IDD 439: Recent Development in Clothing and Textiles (2 Units: LH 30)

To acquaint students with current trends in the field of fashion equipment, fabrics, garment styles and accessories, to adapt existing idea to new trends.

IDD 437: Fashion Drawing I (3 Units: PH 135)

Drawing the figure and apparel.

IDD 423: Fashion Design III (3 Units: PH 135)

Advanced fashion drawing with emphasis on action such as walking, running, reclining, kneeling, bending etc. Drawing from photos and altering them in stylized way, e.g. getting more swing, more style and different postures. Drawing from models and stylizing the drawing with clothes.

IDD 442: Management, Marketing and Exhibition (3 Units: LH 45)

The course will teach student how to conduct a small business like controlling, organizing and directing a personal business, employee and employers relationship will be taken into consideration. A survey of fashion market prices and a comprehensive analysis of cause of the rising cost of grants. Exhibition techniques and exhibition of fashion products.

IDD 432: Fashion Design III (3 Units: PH 135)

Design and production of a variety of garments from original sketches.

IDD 433: Fashion Merchandising I (2 Units: LH 30)

The clothes buyer. Purchasing and marketing of clothes. Style evaluation. Emphasis on West Africa. Showing the line. Decisions on seasonal styles, advertising, style evaluation, and marketing.

IDD 413: Special Project I (3 Units: PH 135)

Independent study in fashion. Work guided by lecturer.

IDD 424: Special Project II (3 Units: PH 135)

Independent study in fashion design. Work guided by lecturer.

IDD 437: Fashion Drawing I (3 Units: PH 135)

Illustration: figure and apparel. Illustrating; developing a portfolio of original sketches.

GRAPHIC DESIGN OPTION

IDD 353: Illustration I (2 Units: PH 90)

Historical survey of prints making converging relief, serigraphy and lithography. Relief printing (letterpress): equipment, printing process of linoleum, woodcut by eliminating and separation methods. Black and white multi-coloured printing.

IDD 354: Illustration II (2 Units: PH 90)

Continuation of illustration I with emphasis on silkscreen and photoscreen printing. Various techniques of printing to be examined. Students will be required to learn the construction of basic equipment. Multi-colour printing and registration methods will be explored.

IDD 355: Advertising Design System and Methods I (3 Units: LH 45)

This course has three interrelated aims, the understanding design systems, the component and interaction between targeted system structures (audience) and synthesis for design implementation and strategy.

IDD 356: Advertising Design System and Methods II (3 Units: LH 45)

Students are given wider scope in the design of poster, book, jacket, logo, and letter headings, Lettering and typographical composition. Discussions, field trips of printing houses and advertising studios. Projects to realize design implementation.

IDD 357: Photography I (3 Units: PH 135)

Historical development of photography. Photography as science and Art. The camera and its components. Introduction to basic working knowledge of the photographic process; materials, equipment and chemicals, darkroom practices. Development in the printing of firms.

IDD 358: Photography II (3 Units: PH 135)

Continuation of photography I with emphasis on the ability to use the camera creatively. Exploration of photography as an image-making process with more emphasis on darkroom techniques.

TEXTILES OPTION

IDD 361: Textile Design I (3 Units: PH 135)

The role of the textile designer. Pattern building. Designing for reproduction. Identification of textile fibres. Chemical construction of fibres and fabrics. Methods and techniques of colour application. Textile paints and pigment.

IDD 362: Textile Design II (3 Units: PH 135)

Focus on textile design development. Designing for furnishing and dress fabrics. Concentration on international textile markets and consumer demands. Industrial dyeing methods. Chemical construction of dyes pigments and paints. Textile finishes. Textile performance. Generic and trade names of textiles.

IDD 363: Dyed and Printed Textile I (3 Units: PH 135)

Introduction to modern industrial methods, roller direct pigment and merchandized printing, etc. History of the printing fabric. History of resist dyeing, studio work involving and dye, plangi, tritik and batik.

IDD 364: Dyed and Printed Textile II (3 Units: PH 135)

Adaptation of designs for printing and dyed fabrics. Mark survey of printed and dyed textiles. Studio experiment with waz, lafum, indigo, and other local and industrial materials.

IDD 365: Woven and Constructed Textiles I (3 Units: LH 30, PH 45)

History of the woven cloth. Basic techniques to understand fabric structure. Exploration of traditional weaving methods and techniques of African woven textiles. Weaving on table looms, (frame and inkle looms).

IDD 466: The Textile Industry (2 Units: LH 30)

Introduction to the textile industry, study of the industry and its process and products with regards to printing, weaving, resist and dyeing. Industrial directory, setting and managing small scale textile industry.

IDD 461: Textile Design and Technology III (3 Units: PH 135)

Designing for the industry. Costumerism. Comprehensive study of design priorities for West Africa. Fabric decoration, application of surface designs, fabric aesthetics. Manufacturing companies and their trade marks. Individual project development. Portfolio, presentation and promotion of designs. Advanced industrial problems. Limitations of technology on designs. A look at West Africa textile industries.

IDD 462: Dyed and Printed Textiles III (3 Units: PH 135)

Effects and faults of modern printed textiles. Colour fastness. Comprehensive study of imported and domestic textiles. Studio work using various pigments and methods, block printing, screen printing. General survey of printed and dyed textiles. Design and production of several lengths of fabric using various media.

IDD 463: Woven and Constructed Textile III (3 Units: PH 135)

General survey woven constructed textiles. Weaving on horizontal looms and vertical looms.

IDD 464: Creative Textiles (3 Units: PH 135)

Practical Work on some more specialized areas to show that students can independently create ideas with textile goods. Some of these ideas may be for furnishing or dress. They can be done so as to include other related accessories.

IDD 465: Computer application in Textile Design (3 Units: PH 135)

Use of computer as a design tool is presented. Lectures, demonstrations, and assignments emphasize the application of computer in textile design.

IDD 413: Special Project I and II (3 Units: PH 135)

Directed research into a problem mutually defined by student and lecturer. Indepth study of techniques, processes of traditional aspects of textiles.

GLASS DESIGN AND TECHNOLOGY

IDD 371: Introduction to Properties and Application of Glass (3 Units: PH 135)

Physical properties of glass. Mechanical properties; strength, elasticity hardness, density and specific gravity. Thermal properties; thermal endurance, thermal conductivity, heat capacity and specific heat capacity.

IDD 372: Glass Melting Furnaces (3 Units: PH 135)

General description of glass melting furnaces. Periodic tank furnace, day tank and pot furnace. Electric melting consideration in furnace design construction.

IDD 373: Batch Calculation Methods (2 Units: LH 30)

Batch calculation methods; arithmetical approximation, method of simultaneous equation, computerized batch calculation, supplementary information relating to glass composition and batch calculations. Provision of basis for evaluation of raw material; introducing raw or modified batches into the operation; taking samples for control analysis. Batch handling and preparation method.

IDD 376: History of Glass (2 Units: LH 30)

The Western European revival glass; manufacture in France, Spain, Netherlands, Scandinavia and Russia. German glass houses.

IDD 374: The techniques of Free Blowing (2 Units: PH 90)

Techniques for the individual; warming outting cane and slabs, clearing pre-heating, positioning rods and accessory tool handling. The free-blowing team “shop” stem preparation for goblet production.

IDD 375: Principles of Glass Ware Designing (2 Units: PH 90)

Glass designing for tableware. Working from drawings making of glasses using calipers and songs. Designing in clear crystal with internal air lecoration.

IDD 377: Properties and Application of Glass (2 Units: LH 30)

Optional properties; detractive and absorptive properties. Electrical properties, electrical conductivity of glass, dielectric properties, viscosity, surface tension. Chemical properties; the chemical durability of glass diversification.

IDD 378: Refractors, Fuel Economic (3 Units: LH 45)

Refractors, properties and testing. Classification of refractors principles of refractory manufacture, slip laws and concepts. Theory governing combustion calculations. Coal carbonization, coke. Solid and liquid fuel combustion. Injectors and electric heating.

IDD 379: Techniques of casting and flame making (3 Units: PH 135)

IDD 380: Glass preparation process (2 Units: PH 90)

Resection occurring during glass preparation, melting phase, firing phase, Homogenizing phase, head conditioning phase, defects in glass, phase, phase equilibrium, identification and interpretation of stone and cords in glass.

IDD 381: Glass Mosaic in Studio Glassmaking (2 Units: PH 90)

Using of gliry-hole, construction of abstract plants, creatures and easer, shorr bird etc. Principal functions of gaffer. Use of millifical in the production of glass ornaments. Production of winged goblets, glass, the technique of line engraving and polishing of fire or pumic.

IDD 382: Textured Surface Designing of Glass (2 Units: PH 90)

Design vases with textured surfaces, application of dietreta decoration with emphasis on opaque coloured glasses.

IDD 471: Industrial Flat Glass Manufacturing Processes (3 Units: PH 135)

Flat glass manufacturing process; sheet glass fourcault method, Pittsburgh processes, lof-colbum method. Plate glass. Bichereux semi-continuous casting, PPG ring roll Process continuous horizontal rolling and polishing operations. Patterned glass manufacturing processes. Float glass. Hand production processes where applicable.

IDD 472: Thermal, Compositional and Structural Effect (2 Units: PH 90)

Relationship of properties to thermal history, composition and structure of glass such as viscosity, surface tension, density and specific gravity chemical durability, electrical properties, optical properties, mechanical properties and their relationship to glass structure.

IDD 473: Primary Sensors for Glass Industry (2 Units: PH 90)

Temperature measuring devices; thermocouple, recitation pyrometers, total radiation, spectrally selective optical and two colour pyrometers. Thermometers; gas liquid and resistance thermometers. Thermomistors pyrometric cones. Flow measurements; orifice plate, flow nozzle, venture tube, laminar flow element, pilot tube. Variable area, Turbino and magnetic flow meters pressure transmitters and strain gauges.

IDD 474: Laminated Glass Techniques (2 Units: PH 90)

Working with laminated glass covered with scales, custom made chandeliers, slumping coloured glasses for production of hanging lamp.

IDD 476: Glass Blowing Casting and Flame Working (3 Units: PH 135)

General laboratory flame working practice. Safety precautions fabrication of laboratory glasswork e.g. Funnels, test tubes, pipettes etc. Casting glass forms.

IDD 475: Advanced Technical Drawing and Fibric Glass (2 Units: PH 90)

Set projects on industrial glass furnaces in Nigeria, furnaces for container glass, both regenerative and recuperative. Day tank furnaces. Forming machines and moulds.

IDD 475: Advance Technical Drawing of Machine Parts and Tools (2 Units: PH 90)

Continuation of set projects; sheet glass furnaces; Auxilliery furnaces burners machine parts and tools.

IDD 442: Management, Marketing and Exhibition (3 Units: LH 45)

Organisation and management of glass product, use of equipment and how to manage and repair them; marketing strategies of finished products. Acquainting of students with

the various methods and appropriate ways of conducting business with glass products and glass goods generally e.g. Mounting, laminating, exhibition of glass products.

METAL DESIGN OPTION

IDD 391: Jewellery I (3 Units: PH 135)

Workshop function. Use of tools. Basic forming techniques. Handling of precious metals. Introduction to jewellery processes, sawing, filling and sanding, etching, polishing, engraving, etc. chains, tubing and hinges, Metal inlay.

IDD 392: Jewellery II (3 Units: PH 135)

Enamelling. Filigree. Production of cast Jewellery. Construction and assembly of sets of Jewellery. Processes; chasing and repousse. Applique

IDD 393: Metal Smithing I (3 Units: PH 135)

Construction, fabrication and finishing of steel, aluminium copper and its alloys. Planishing, raising, hollowing and general beaten metal work.

IDD 394: Metal Smithing II (3 Units: PH 135)

Forgework. Tool-making. Drawing down. Metal construction and assembly scroll work.

IDD 395: Theory of Metals I (3 Units: LH 45)

History of metals. Basic metallurgy of noble metals, iron, aluminium, copper and its alloys. Workshop methods, Processes; etching, lacquering, embossing, etc chemical and mechanical treatment of metals.

IDD 396: Theory of Metals II (3 Units: LH 45)

Alloy calculation. Identification of metals. Assaying. Processes; hardening, tempering, normalizing, etc. enamel. Colouring of metals.

IDD 387: Metal Designing I (2 Units: PH 90)

Working drawings for studio projects; scaled drawing and design for sets of products.

IDD 385: Foundry Practice I (3 Units: LH 45)

Principles of design for cast products. Introduction to foundry practice. Equipment and tools for ferrous and non-ferrous metal founding. Pattern making; single and split patterns. Introduction to various industrial metal casting processing; emphasis on shell mould and investment mould casting.

IDD 386: Foundry Practice II (3 Units: LH 45)

Sand casting. Cores, core prints and core boxes. Sand moulding; green/damp sand moulds and skin dry mould. The furnace and melting techniques.

IDD 481: Jewellery III (3 Units: PH 135)

Complex compositions and advanced techniques in Jewellery. Workshop refining of precious metals. Colouring of jewellery. Finishing of Jewellery.

IDD 484: Computer Application in Metal Design (2 Units: PH 90)

Use of a computer as a design tool is presented. Lectures, demonstrations, and assignments to emphasize the application of computer in metal design.

IDD 442: Management, Marketing and Exhibition (3 Units: LH 45)

Organisation and management of metal product. Use of equipment and how to manage and repair them; marketing strategies of finished products. Acquainting students with the various methods and ways of conducting business with metal product and goods generally and techniques of presentation of metal products e.g. mounting, lamination. Exhibition of metal products.

IDD 482: Metal Smiting III (3 Units: PH 135)

Advanced work in ferrous and non-ferrous metals. Heat treatment of metals; hardening, tempering, normalizing, etc. Practical demonstration in areas covered under. Theory of Metals III Forging.

IDD 483: Theory of Metal III (3 Units: PH 135)

Decorative techniques, Gem setting. Tool making. Aluminium fabrication and finishing. Electroplating, refining of precious metals.

IDD 413/428: Special Project I and II (3/3 Units: LH 45/45)

A major project work in metal. An attempt to improve existing techniques and designs. The student is allowed to select topics which shall be approved and carried out under supervision of a lecturer.

GENERAL COURSES

IDD 341: History of African Design (2 Units: LH 30)

Pre-historic design in Africa (North, West, East and South Africa). Concepts of design will be discussed, 16th – 19th centuries History of Art and Design in Africa. Various design schools of thought in Africa will be treated through lectures, tutorials and library investigations. Reference to Textiles, Graphics, Ceramics, Glass, Metal Work, Jewellery, leather and other crafts.

IDD 415: Principles and Issues of Design in West Africa (2 Units: LH 30)

Structures of small and large scale local Industries in Nigeria. Discussions on design and production in Nigeria. Sources and processing of raw materials, procurement of tools and equipment. Apprenticeship, professional associations. Issues of copyright laws.

IDD 318: Photography (3 Units: PH 135)

Principles of photography including film exposure, darkroom procedures for printing and processing as well as evaluating negatives and prints. Depth of field action photograph, composition and nature photography.

IDD 411: Research Methods and Technology (3 Units: LH 45)

This course aims at giving the student an opportunity to develop his research techniques and writing skills, the course incorporates the use of elementary statistical analysis in problem solving.

IDD 499: Project Dissertation (3 Units: PH 135)

At the beginning of the final year, the student will be given a project on which he will be required to prepare a project report. The project will require a student to plan and carry out an investigation on a living project under the supervision of a member of academic staff.

3.8 LANDSCAPE ARCHITECTURE DEGREE PROGRAMME

3.8.1 Introduction

The benchmark statement for Landscape Architecture is to provide a guideline for the description and the characteristics of the degree programme and to articulate the abilities and skills expected of graduates of Landscape Architecture. The Benchmark minimum standards are not to be seen as a specification of a detailed curriculum in the subject.

In the context of Nigerian Universities, a five-year degree leading to a professional Bachelor's degree is recommended. This statement provides a guide for designing the Bachelor's degree programme.

Landscape architecture programme focuses on interventions in the landscape through the activities of planning, design and management; the implementation of proposals; and the art and science that underpins all these activities. The practice of Landscape Architecture often involves either the sustenance of existing landscapes or the creation of new ones. In each of these cases however, the landscape Architect seeks to create and aesthetically pleasing, functionally appropriate and ecologically healthy environment. Landscape Architecture also seeks to the diverse and changing needs of the society through sustainable enhancement of the intrinsic qualities of places. Landscape Architecture occupies a key position as the interface between art and design on one hand and the physical, natural and social sciences on the other.

Landscape Architecture is concerned with all types of landscape from urban to rural and at all scales from the smallest residential front garden to whole regions.

The overall aim of all landscape architecture programmes should therefore be:

- To impart to student appropriate subject-specific knowledge and understanding and to achieve proficiency of skills to successfully engage in landscape planning, design, management and research.
- To produce experts that are intellectually mature, socially responsible and environmentally sensitive.

3.8.2 Aims and Objectives

A Landscape Architectural training programme should be committed to:

- a) Offering a high-quality of professional education aimed at establishing core principles, theories and concepts, techniques and materials used in Landscape architecture
- b) Equipping the student with advanced knowledge and comprehension of physical and natural systems and the range of social, economic and cultural factors that shape the landscape;
- c) Inculcating in the students adequate knowledge, attitudes, specialised skills to interpret or develop briefs, locate, analyse and synthesise information in order to develop appropriate innovative solutions to landscaping problems;
- d) Creating enabling environments that will foster active interest in research and development in landscape architecture and related fields
- e) Provide the student with entrepreneurial knowledge and skills to enable him/her to be self-reliant.

Departments are encouraged to explore the rich cultural and traditional natural resources in the country in general and within its immediate environment in particular and innovate in the overall programme content and delivery.

3.8.3 Programme Duration

Landscape Architecture programme will normally be for a minimum period of 10 semesters leading to a professional undergraduate degree in Landscape Architecture. A students' Industrial Training programme of six months duration shall be incorporated in the programme without prejudice to the minimum academic semesters recommended above.

3.8.4 Admission Requirements

Admission into the Landscape Architectural programmes may be through any of the following modes:

UTME Admission: Candidates who have successfully completed the Senior Secondary School or its equivalent and obtained five credits in Mathematics, English Language, Biology and two other subjects from the following list will be eligible for admission; Chemistry, Physics, Technical Drawing, Fine Arts, Geography, Building Construction, Land Surveying and Agriculture.

Direct Entry Admission: Candidates who fulfil the requirements for Normal Admission and who have obtained G.C.E Advanced Level, HSC/IJMB or equivalent passes in Biology and Physics or Geography, Technical Drawing, Fine Arts, Geography, Building Construction, Land Surveying and Agriculture may be admitted at the 200 level of the programme. In addition, a candidate who fulfils normal admission requirements and holds a Higher National Diploma (HND) certificate in Architecture, Urban & Regional Planning, Building, Estate Management, Land Surveying, Botany, and Horticulture at Upper Credit Level may be considered for Admission into the programme at the appropriate level. Any deficiencies in their background should be rectified by taking appropriate courses.

3.8.5 Graduation Requirements

Total minimum credit required for graduation at the undergraduate level is 90 and 120 for students admitted through UTME and Direct Entry admissions respectively. In order to graduate, a student must pass all compulsory and recommended courses.

3.8.6 Learning Outcomes:

Graduate of Landscape Architecture programme will normally be expected to demonstrate:

- 1) Ability to analyse design and environmental development problems, synthesize the various elements and provide appropriate solutions.
- 2) Ability to understand the needs of a client and users of the built environment and to cater for these through sustainable landscape design proposals.
- 3) The ability to produce appropriate and imaginative solutions that are technologically sound, economically feasible, environmentally friendly and aesthetically pleasing.
- 4) The ability to analyse the feasibility, legal implication, and impact of design schemes on users and the public at large.

- 5) The ability to understand and assess the impact of development schemes on the environment.
- 6) The ability to communicate design proposals in the appropriate medium to clients, the public, and members of the building profession and construction team, and;
- 7) The ability to integrate and offer inputs to other professionals in the environmental design team to achieve project objectives.

3.8.7 **Instructional Modules**

It is expected that, whatever the approach adopted by a given Faculty of Environmental Sciences, the Landscape Architecture programme will select course from the following six instruction modules:

- A. Landscape Architectural Design and Graphic Communication Skills
- B. Art and Humanities
- C. History and Theoretical Studies
- D. Construction Technology and Environmental Services
- E. Physical Sciences
- F. Professional Practice, Management and Entrepreneurial Studies

3.8.8 **Instructional Module capabilities**

The main abilities and skills (cognitive, architectural and general) that the modules are expected to inculcate in the students are as follow:

Module A: Landscape Architectural design and Communication

- To develop the skills and techniques in problem recognition, information gathering, solution, synthesis, evaluation and design.
- To undertake design exercises varying in magnitude from relatively simple requirement, through to urban planning and landscape design problems that need specialized skills and knowledge.
- Develop ability to integrate technical, social, environmental, aesthetic, as well as financial knowledge for creative Landscape architectural design solutions
- To be able to handle landscape planning and constructional technology and detailing at certain levels of the skills acquisition process within this module.
- To develop imaginative and creative faculties of the student so as to gain confidence in working processes requiring communication skills.
- To provide the student with the experience and skills in effective visual communication using manual and electronic graphic modelling tools.

Module B: History and Theoretical Studies

- To develop an understanding of the history and theory of Landscape Architecture across cultures aimed at clarifying the scale of values and concepts within which landscape architecture is created.
- To examine landscape globally aimed at stimulating students to the recognition of the existence of conceptual resources in various landscape traditions in the world.
- To develop the necessary framework upon which the student bases his/her creative work.

Module C: Arts and Humanities

- To expose the student of landscape architecture to the general cultural, historical, psychological and sociological context within which Landscape Architecture is created.
- To clarify some practical implications of design decision from the point of view of the users, the client and the public at large.
- To expose the students to the legal, political and economic framework within which he is expected to operate as a Landscape Architect.

Module D: Construction Technology and Environmental Sciences

- To develop the understanding of hard elements of landscape, the structure and the process involved in putting them together to complement the natural elements.
- To expose the student to environmental services such as plumbing drainage, electrical, lighting, vertical transport systems, security systems and landscape development.
- To develop an understanding of implementation, cost implication, managerial, as well as, various processes that go into realizing designer's concept.
- To acquire knowledge to be able to determine space requirements and to integrate services within the fabric of landscape.

Module E: Physical Sciences and Information Technology

- To master the basic techniques, skills and principles of physical sciences as it relates to the building industry.
- To acquire the knowledge and skills in Information Technology and application of computers to the landscape Construction.
- To acquire proficiency in Computer Aided Design, Word processing, Data processing and Internet.
-

Module F: Management and Entrepreneurial Studies

- To equip the student with management tools for the coordination, control, administration and management of project execution.
- To expose the students to basic principles of law, professional practice and contract administration and management.
- To develop entrepreneurship skills that enables the student to be resourceful and self-reliant.

3.8.9 Resource Requirements for teaching and Learning Personnel

a) Academic Staff

The academic staff requirement is a staff/student ratio of 1:15, and in the appropriate mix of 20%:35% for Professor/Reader-Senior Lecturer-Lecturer I and below:

In addition to the regular academic staff, Landscape Architecture should be able to benefit from the wealth of experience of professionals from the field who could join the teaching staff:

- Studio Senior Lecturer Must be a Registered Landscape Architect with a minimum of 10 years relevant field experience.

- Studio Associate Fellows: Must be a Registered Landscape Architect with a minimum of 15 years relevant field experience, subject to peer review.
- Studio Fellows: Must be a Registered Landscape Architect and Fellow of Nigeria Institute of Landscape Architects or its equivalent with a minimum of 20 years relevant field experience.

Courses for Landscape Architecture Degree Programme

Courses at 100 level Landscape Architecture

100-LEVEL LANDSCAPE ARCHITECTURE					
Course Code	Title	Units	Status	LH	PH
ARC123	Freehand sketching I	2	C	-	90
ARC 161	Introduction to Environmental Sciences	2	C	30	-
BIO 101	General Biology I	3	R	45	-
BOT 101	Diversity of Plants	3	R	45	-
CSC 101	Introduction to Computer Science	3	R	15	90
GST 111	Communication in English I	2	R	30	-
GST 113	Nigerian Peoples and culture	2	R	30	-
GST 121	Use of Library, study skills & Information and Communications Technology (ICT)	2	R	30	-
MAT101	General Mathematics I	3	R	45	-
PHY 111	General Physics I	3	R	45	-
GEO 103	Introduction to Human Geography	2	E	30	-
ARC 124	Freehand Sketching II	2	C	-	90
ARC 131	History of Art	2	C	30	-
BIO 102	General Biology II	3	R	45	-
GST 122	Communication in English II	2	R	30	-
GST 112	Logic, Philosophy and Human existence	2	R	30	-
MAT 102	General Mathematics II	2	R	30	-
BOT 102	Flowering Plants, Forms and Function	2	E	30	-
	Total	42			

A minimum of 2 units of elective courses are recommended for each semester.

Courses at 200 level Landscape Architecture

200-LEVEL LANDSCAPE ARCHITECTURE					
Course Code	Title	Units	Status	LH	PH
ARC 221	Descriptive geometry I	2	C	-	90
LAA 211	Foundations of Landscape design I	3	C	15	90
LAA 221	History of Landscape Architecture	2	C	30	-
LAA 223	Landscape design methods	2	C	30	-
LAA 231	Landscape Components and Methods I	3	C	45	-
LAA 233	Plants & design I	3	C	45	-
GEO 231	Introduction to Climatology and Biogeography I	2	R	30	-
CSC 101	Introduction of Computer Science	3	R	15	90
ARC 222	Descriptive Geometry II	2	C	-	90
LAA 212	Basic Land design studio	2	C	-	90
LAA 232	Landscape Components and Methods II	3	C	45	-
LAA 214	Plants & design II	3	C	45	-
ARC 262	Land Surveying for Architects	2	R	15	45
GEO 232	Introduction to Climatology and Biogeography II	2	R	30	-
GST 211	History and Philosophy of Science	2	R	30	-
GST 222	Peace studies and conflict resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
URP	Basic Theory of Planning	2	E	30	-
URP	Site Selection and Planning	2	E	30	-
	Total	44			

A minimum of 2 units of elective courses are recommended for each semester.

Courses at 300 level Landscape Architecture

300-LEVEL LANDSCAPE ARCHITECTURE					
Course Code	Title	Units	Status	LH	PH
LAA 321	Regional Landscape History	2	C	30	-
LAA 311	Landscape graphics	2	C	-	90
LAA 313	Landscape design I	3	C	-	135
LAA 362	Introduction to computer application in Landscape design	2	R	15	45
LAA 331	Landscape components and methods III	3	C	45	-
LAA 321	Theory and Philosophy of Landscape	3	C	45	-
LAA 341	Landscape Management I	2	C	30	-
LAA 312	Landscape Planning I	2	C	30	-
BOT 301	Plant Taxonomy	3	C	15	90
LAA 314	Landscape Design II	3	C	-	135
BOT 312	Conservation and Biodiversity	3	R	45	-
LAA 332	Land systems Analysis	3	C	15	90
LAA 334	Forestry I	3	C	30	45

Please, forward your comment on any section of this document to the following email:

nucassessment@gmail.com

You can also call the following phone numbers: 08033145087, 08033201097

All comments should be received before 31st October, 2015

GST 311	Entrepreneurship	2	R	30	-
LAA 336	Horticulture	2	E	30	-
LAA 337	Aforestation	2	E	30	-
	Total	40			

A minimum of 2 units of elective courses are recommended for each semester.

Courses at 400 level Landscape Architecture

400-LEVEL LANDSCAPE ARCHITECTURE					
Course Code	Title	Units	Status	LH	PH
LAA 401	Landscape Architecture SIWES	18	C	24 weeks	
LAA 411	Design and the Community	3	R	45	-
LAA 452	Research Methodology	2	R	30	-
LAA 462	Computer applications in Landscape design	2	R	15	45
LAA 436	Environmental Impact Assessment	2	C	30	-
LAA 442	Landscape Management II	2	C	30	-
LAA 434	Forestry II	3	C	30	45
LAA 414	Landscape Planning II	2	C	30	-
	Total	34			

A minimum of 2 units of elective courses are recommended for the second semester.

Courses at 500 level Landscape Architecture

500-LEVEL LANDSCAPE ARCHITECTURE					
Course Code	Title	Units	Status	LH	PH
LAA 521	World gardens	3	C	45	-
LAA 511	Landscape Architecture Project/Dissertation I	3	C		
LAA 541	Landscape Architecture Practice	3	C	45	-
LAA 523	Project Seminars	4	C	-	180
LAA 551	Special Studies	3	R	15	90
LAA 516	Recreation and Park Planning	2	C	15	45
LAA 532	Wildlife and Conservation	2	C	30	-
LAA 542	Environmental Law and practice	3	R	45	-
LAA 515	Africa Landscape Design Studio	2	C	-	90
LAA 514	Urban Landscape Design Studio	3	C	-	135
LAA 512	Landscape Architecture Project/Dissertation I	3	C		
	Total	31			

A minimum of 2 units of elective courses are recommended for each semester.

3.8.10 Synopses of Sample Courses in Landscape Architecture Degree Programme

BIO 101: General Biology I (3 Units: LH 45)

Cell structure and organization, functions of cellular organelles, diversity, characteristics and classification of living things, general reproduction, interrelationship of organisms; heredity and evolution, elements of ecology and types of habitat.

BIO 102: General Biology II (3 Units: LH 45)

A generalized survey of the plant and animal kingdoms based mainly on study of similarities and differences in the external features, ecological adaptation of these forms

CSC 101: Introduction to Computer Science (3 Units: LH 15 & PH 60)

The course provides an introduction to the history of Computers and their generations. Computer Hardware; functional components Modern input/output units, software, Operating Systems, Application Packages, Program: Development; Flow charts and algorithms; Program Objects BASIC or VISUAL BASIC Fundamentals.

BOT 101: Diversity of Plants (3 Units: LH 45)

As provided by the Department of Botany or Faculty of Science for 100 Level Botany

BOT 102: Flowering Plants, Forms and Function (2 Units: LH 30)

As provided by the Department of Botany or Faculty of Science for 100 Level Botany

LAA 211: Foundations of Landscape Design I (3 Units: LH 15, PH 90)

The course involves the study of the organization procedures for landscape architectural planning. Collection and processing of data, management of data, portfolio analysis, costing of projects, professional assessment of clients requirements, Environmental Impact Assessment, the use of remote sensing in landscape architectural designs, professional ethics as provided by the Institute of Landscape Architecture.

LAA 221: History of Landscape Architecture (2 Units: LH 30)

History of Landscape Architecture explores the heritage, tradition, theory and ideology of landscape design. It commences with ancient gardens and ends with contemporary park history and modern design.

LAA 223: Landscape design methods (2 Units: LH 30)

The module provides an introduction to the relationships between the client brief, site context and design process that relate to landscape projects

LAA 231: Landscape Components and methods I (3 Units: LH 45)

Students are introduced to the use of hard construction materials and plants in landscape design. Factors discussed will include the ecological, aesthetic and functional qualities of hard materials and plants along with issues of maintenance and sustainability in terms of design choice, sourcing and application.

LAA 233: Plants & Design (3 Units: LH 45)

This course offers an introduction to general principles of horticulture and horticultural practices in different regions of the world.

LAA 212: Basic Land design studio (2 Units: PH 90)

Studio based landscape design exercises to apply key skills and knowledge acquired

LAA 232: Landscape Components and methods II (3 Units: LH 45)

A follow on course to LAA 223 and includes an introduction to the principles of sustainability and ecological systems relative to landscape architecture and how these influence the choice and use of materials and plants.

LAA 214: Design and Community II (3 Units: LH 45)

The module introduces students to community based design, defined as: 'a process of design and management of physical change to the built environment, which allows the 'end user' to make a significant contribution to the scope, procedures and outcomes of the project'. Projects that might be considered range from small-scale environmental projects

LAA 321: Regional Landscape History (2 Units: LH 30)

This course explores the garden traditions of France, Great Britain and then focuses on Landscape Architecture in the United States, park history, and modern design. This is the history of places and ideas, sites, and symbols

LAA 311: Landscape Graphics (2 Units: PH 90)

The module provides an introduction to the study of visual communication in landscape and built environment aspects. It will develop basic skills and confidence in visual observation and graphic communication using a variety of media including hand drawn work, CAD, SketchUp and Photoshop.

LAA 313: Landscape Design I (3 Units: PH 135)

Studio based landscape design exercises applying key skills, theorems and knowledge at 200 level

LAA 362: Introduction to Computer applications in Landscape design
(2 Units: LH 15, PH 45)

The course introduces the use of computer packages for basic landscape design proposal processes

LAA 331: Landscape Components and methods III
(3 Units: LH 45)

A development of the introduction to Landscape Components and methods II, this course develops a detailed understanding of the design potential of hard construction materials and plants in the creation and detailing of sustainable landscape projects. It also encourages students to consider how an understanding of the ecological processes of a landscape can guide the use and choice of materials and plants. The module will introduce means of professionally representing both hard construction and planting designs.

LAA 321: Theory and Philosophy of Landscape (3 Units: LH 45)

This course links the idea and practice of fine art with the idea and practice of landscape design that is 'landscape as art'. The module seeks to link site based landscape design with theory and precedent and individual self expression

LAA 341: Landscape Management I (2 Units: LH 30)
Introduction to the principles and techniques for the long term care and development of new and existing landscapes at different scales.

LAA 312: Landscape Planning I (2 Units: LH 30)
The module introduces the challenges of development on the urban fringe, requiring a multi-disciplinary, holistic approach. It is intended to introduce students to the context of working towards sustainable development of the landscape whilst recognizing the constraints of the planning system and utilizing GIS for data interrogation

BOT 301: Plant Taxonomy (3 Units: LH 15, PH 60)
Introduction to Plant Taxonomy and its significance, principles and concepts in plant taxonomy. The course includes construction and use of taxonomic keys, experimental taxonomy with special emphasis on cytotaxonomy and chemotaxonomy. Sources of taxonomic data and methods of analysis

LAA 314: Landscape design II (3 Units: PH 90)
Studio based landscape design exercises applying key skills, theorems and knowledge at 200 level.

BOT 312: Conservation and Biodiversity (3 Units: LH 45)

LAA 332: Land systems Analysis (3 Units: LH 15, PH 90)
The course introduces Methods and techniques for researching, inventorying, recording and mapping site data.

LAA 334: Forestry I (3 Units: LH 30, PH 45)
The course introduces the general principles of forestry: forestry species, planting nursery, management. It discusses the characteristics of tropical forestry, forestry in Europe and temperate lands and in arid climates.

LAA 401: Landscape Architecture SIWES (18 Units: 24 Weeks)

LAA 441: Design and the Community (3 Units: LH 45)
The module introduces students to community based design, defined as: 'a process of design and management of physical change to the built environment, which allows the 'end user' to make a significant contribution to the scope, procedures and outcomes of the project'. Projects that might be considered range from small-scale environmental projects such as community parks or gardens, designs for individual buildings, renewable energy schemes, through to large-scale urban design proposals for new neighbourhoods or small settlements.

LAA 452: Research Methodology (2 Units: LH 30)
This course is aimed at providing the students with necessary skill R for technical report writing. The area of emphasis involved the content; format, data collection, analysis and presentation of results; bibliography/References

LAA 462: Computer applications in Landscape design (2 Units: LH 15, PH 45)
The course explores the use of advanced computer packages to formulate landscape proposals for the control of: erosion, desertification, gulleys, landscape and water hyacinth

LAA 436: Environmental Impact Assessment (2 Units: LH 30)

The course looks at various environmental parameters that may be affected by a project and seeks to provide students with knowledge of the principles and techniques for data collection, analysis, results interpretation and presentation of impact assessment reports.

LAA 442: Landscape Management II (2 Units: LH 30)

The course is intended to expose the students to the range of management skills and contract administration knowledge for effective landscape management.

LAA 434: Forestry II (2 Units: LH 15, PH 45)

Forestry as a landscaping tool: afforestation, desertification, flood control and landslide control studio practice using IT and computers to present forestry plans for varying environment.

LAA 521: World Gardens (3 Units: LH 45)

Case Studies of various outstanding and historic gardens of the world located in Europe, Asia Oceania and the Americas, Archaeological information on hidden and forgotten gardens comparative reviews of characters exhibited by different flowers and fauna in different world locations.

LAA 511/512: Landscape Architecture Project/Dissertation I (6 Units: PH 270)

The Design Thesis (dissertation) gives the student an opportunity to identify a site and a design issue to suit their portfolio and personal preference. The student will be expected to identify and issue, develop a brief and explore design solutions to resolve the aims and objectives of that brief. The choice and size of project will be the approval of the tutors.

LAA 541: Landscape Architectural Practice (3Units: LH 45)

The course aims to expand students' understanding and awareness of the breadth and depth of the potential role of a Landscape Architect in practice. Students will research accepted and understood stances and explore their personal understanding and engagement with the discipline at a professional and ethical level as well as the more frequent engagement with the concept of design as a precedent and as an outcome of the discipline

LAA 523: Project Seminars (4Units: PH 180)

Students will be expected to present seminars that will include text, graphics and oral presentation of selected landscape projects of their choice

LAA 551: Special Studies (3Units: LH 15, PH 90)

The course involves participation in a 1 week Fieldwork that will enable students to gain experience and knowledge of the characteristics of various built design projects and their associated context and culture.

LAA 516: Recreation and Park Planning (2 Units: LH 15, PH 45)

The course is about the design of spaces for recreation in urban context; spaces around and between buildings. It introduces and explores the terminology, concepts and principles for the design of parks and other recreation spaces as 'Responsive Environments'

Please, forward your comment on any section of this document to the following email:
nucassessment@gmail.com
You can also call the following phone numbers: 08033145087, 08033201097
All comments should be received before 31st October, 2015

LAA 532: Wildlife and Conservation

(2 Units: LH 30)

Wildlife in the tropics, wildlife management in selected African countries endangered animal and forests in Africa and the ECOWAS sub-region planning and costing of wildlife programmes.

LAA 542: Environmental Law and Practice

(3 Units: LH 30)

An introduction to the local and trans-national environmental laws that impact on landscape architectural practice

LAA 514: Urban Landscape design studio

(3 Units: PH 135)

The module is about the design of spaces in an urban context; spaces around and between buildings. It introduces and explores the terminology that describes the characteristics of urban landscapes as 'Responsive Environments'

DRAFT

3.9 QUANTITY SURVEYING DEGREE PROGRAMME

3.9.1 Introduction

Quantity surveying is part of the large Environmental Science subject domain that shares much of its knowledge base with other disciplines. It is primarily concerned with the nature, measurement, costing and management of resources in the building construction process. Quantity surveying is concerned with the provision and analysis of information for decision making and resource allocation in the built environment. Its very nature requires that students have a broad knowledge base and acquire skills for managing and effectively integrating strands of information from diverse subject areas.

3.9.2 Aims and objectives of quantity surveying education programmes

The aims and objectives of Bachelor's degree in Quantity surveying programme is to:

- a) Produce graduate Quantity Surveyors who would be adaptable to tackle contemporary cost aspects of constructional activities of national importance and be able to generate employment
- b) Produce Quantity Surveyors with sound academic background that will equip the graduate with the necessary knowledge to fit into evolving technological advancements.
- c) Produce graduates that will be able to provide Technical, managerial and financial services to Building, Civil, Highways, Heavy engineering, Petrol-chemical, Manufacturing Industries and the Public Service.
- d) Produce graduates that will be able to handle complex problems of the Environment such as deforestation/afforestation, desertification, erosion and pollution control and coastal protection.
- e) Produce graduate that will be able to proceed to specialized areas of Quantity Surveying that will lead to teaching, research and development.
- f) Provide cost control and management services on diversified projects in the public and private sector.
- g) Provide sound contract planning and Administration contract Auditing and project management.

3.9.3 Programme Duration

The duration of the Quantity Surveying course should be a minimum of ten (10) academic semesters that will include a six (6) month supervised Student industrial Work Experience (SIWES) programme.

3.9.4 Admission Requirements

Admission into the Quantity surveying programmes may be through any of the following modes:

UTME Admission: Candidates who have successfully completed the Senior Secondary School or its equivalent and obtained five credits in Mathematics, English Language, Physics and two other subjects from the following list will be eligible for admission currently through the Unified Tertiary Matriculation Examinations (UTME); Building Construction, Technical Drawing, Economics, Geography, Chemistry, Biology, and Commerce..

Direct Entry Admission: Candidates who fulfil the requirements above and who have obtained G.C.E. Advanced level, H.S.C/IJMB or equivalent passes in Mathematics and

Physics, or Mathematics or Physics and any other subject noted above or candidates who hold a National Diploma (ND) or Higher National Diploma (HND) at may be admitted into the 200 - level of the programme. Special consideration may be given to candidate holding a BSc or HND in related fields including: Building, Architecture and Allied professions in addition to satisfying other university requirement for admission into 300 Level.

3.9.5 Resource Requirement for Teaching and Learning

See Section 1.6

3.9.6 Courses for Quantity Surveying Degree Programme

Courses for 100 Level Quantity surveying

100-LEVEL QUANTITY SURVEYING					
Course Code	Course Title	Units	Status	L H	PH
GST 111	Communication in English I	4	C	60	-
GST 112	Logic, Philosophy and Human Existence	2	R	30	-
GST 113	Nigerian Peoples and Culture	2	R	30	-
GST 121	Use of Library, Study Skills and Information Communication Technology (ICT)	2	C	30	-
GST 122	Communication in English II	2	C	30	-
MTH 101	Elementary Mathematics I	3	C	45	-
MTH 102	Elementary Mathematics II	3	C	45	-
QTS 101	Introduction to Quantity Surveying	2	C	30	-
BUD 101	Introduction to Building I	2	C	30	-
BUD 102	Introduction to Building II	2	C	30	-
BUD 171	Introduction to Valuation for Builders	2	C	30	-
CHM 101	Physical Chemistry I	3	R	30	45
PHY 101	General Physics I	3	R	30	45
PHY 102	General Physics II	3	R	30	45
PHY 103	General Physics III	3	R	30	45
BUD 103	Technical Drawing	2	R	15	45
PHY 107	General Physics Laboratory I	2	R	-	90
GEO 109	Introduction to Landuse Planning	3	R	45	-
ARC 112	Planning the Built Environment	2	R	15	45
GEO 106	Introduction to Environmental Science	3	R	45	-
GEO 105	Elementary Land Surveying	2	R	15	45
BUD 142	Principles of Economics for Builders	2	R	30	-
ECO 102	Introduction to Economics	2	R	30	-
ACC 102	Introduction to Accounting	2	R	30	-
	Total	58			

Note: Two or three courses to be selected from the list of recommended courses.

Courses for 200 Level Quantity surveying

200-LEVEL QUANTITY SURVEYING					
Course Code	Course Title	Units	Status	LH	PH
GST 211	Environment and Sustainable Development	2	R	30	-
GST 222	Peace and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
QTS 201	Principles of Measurement and Description I	2	C	30	-
QTS 202	Principles of Measurement and Description II	2	C	30	-
PHY 211	Mechanics II	3	C	30	45
BUD 203	Architectural Design for Builders	2	C	30	-
BUD 221	Building Construction and Materials I	3	C	30	45
BUD 222	Building Construction and Materials II	3	C	30	45
BUD 211	Structural Mechanics I	3	R	30	45
BUD 212	Structural Mechanics II	3	R	30	45
BUD 281	Soil Mechanics and Foundation I	2	R	30	-
BUD 282	Soil Mechanics and Foundation II	2	R	30	-
BUD 261	Land Surveying I	2	R	15	45
BUD 262	Land Surveying II	2	R	15	45
MTH 201	Mathematics Methods I	3	R	45	-
MTH 204	Linear Algebra I	2	R	30	-
MTH 205	Linear Algebra II	2	R	30	-
STA 203	Statistics for Physical Sciences and Engineering	3	R	45	-
	Total	45			

Note: Two to four courses to be selected from the list of recommended courses.

Courses for 300 Level Quantity surveying

300 –LEVEL QUANTITY SURVEYING					
Course Code	Course Title	Units	Status	LH	PH
QTS 301	Measurement of Construction Works I	3	C	30	45
QTS 302	Measurement of Construction Works II	3	C	30	45
QTS 303	Tendering and Estimating I	3	C	30	45
QTS 304	Tendering and Estimating II	3	C	30	45
BUD 302	Statistics for Builders	2	R	30	-
BUD 311	Structural Analysis	3	C	45	-
QTS 305	Building Economics	2	C	30	-
BUD 321	Construction Technology I	2	C	30	-
BUD 322	Construction Technology II	2	C	30	-

BUD 314	Construction Management	2	C	30	-
BUD 331	Building Maintenance I	2	R	30	-
BUD 332	Building Maintenance II	2	R	30	-
BUD 341	Building Services and Equipment I	2	R	30	-
BUD 342	Building Services and Equipment II	2	R	30	-
BUD 312	Structural Design	3	R	30	45
ESM 303	Elements of Property Management	2	R	30	-
BUD 344	Housing Production	2	R	30	-
BUD 345	Sociology of Urban Housing	2	R	30	-
SOC 323	Sociology of Urban Life	2	R	30	-
GEO 307	Settlement Geography	2	R	30	-
ARC 314	Principles of Landscape Design	2	R	30	-
ACC 312	Financial Accounting I	2	R	30	-
ACC 314	Cost Accounting I	2	R	30	-
ACC 325	Cost Accounting II	2	R	30	-
GST 311	Entrepreneurship	2	R	30	-
	Total	56			

Note: One to three courses to be selected from the list of recommended courses.

Courses for 400 Level Quantity surveying

400-LEVEL QUANTITY SURVEYING					
Course Code	Course Title	Units	Status	LH	PH
QTS 401	Measurement of Civil Engineering Construction (Works)	3	C	30	45
QTS 402	Specification Writing	2	C	30	-
QTS 403	Research Methods I	3	R	45	-
BUD 431	Construction Plant and Equipment	2	C	30	-
BUD 423	Building Contract Law and Arbitration	2	R	30	-
BUD 441	Building Services and Equipment III	2	C	30	-
BUD 452	Construction Economics	2	C	30	-
BUD 461	Operation Research	2	C	30	-
BUD 451	Project Planning and Control	2	R	30	-
BUD 454	Production Management	2	R	30	-
BUD 464	Business Organization and Accounts	2	R	30	-
ESM 405	Urban Land Economics	2	R	30	-
ESM	Personnel Management and Industrial Relations	2	R	30	-
ACC 413	Financial Management	4	R	60	-
ACC 415	Management Accounting	3	R	45	-
ACC 416	Taxation and Tax Management	3	R	45	-
BUS 433	Marketing Research	3	R	45	-
BUS 420	Economics of Production	3	R	45	-
BUS 444	Marketing Management	3	R	45	-
QTS 404	SIWES	18	C	24 Weeks	
	Total	65			

Note: Any one course may be selected from the list of recommended courses.

Courses for 500 Level Quantity surveying

500-LEVEL QUANTITY SURVEYING					
Course Code	Course Title	Units	Status	LH	PH
QTS 501	Measurement of Construction Works (Services and Equipment)	3	C	30	45
QTS 504	Professional Practice and Ethics	2	C	30	-
QTS 505	Contract Administration I	2	C	30	-
QTS 506	Contract Administration II	2	C	30	-
QTS 507	Computer Application to QS	2	C	-	-
QTS 508	Measurement of Alteration and Maintenance Works	3	C	30	45
BUD 551	Project Management I	2	C	30	-
BUD 552	Project Management II	2	C	30	-
QTS 509	Research Method II	3	C	45	-
QTS 590	Project Dissertation	6	C	-	270
QTS 502	Advanced Cost Control I	3	R	45	-
QTS 503	Advanced Cost Control II	3	R	45	-
ESM 504	Feasibility and Viability Appraisal I	2	R	30	-
ESM 505	Feasibility and Viability Appraisal II	2	R	30	-
BUD 544	Budgeting and Finance in Construction	2	R	30	-
BUD 554	Environmental Impact Assessment	2	R	30	-
QTS 510	Professional Practice and Procedure	3	R	30	45
QTS 511	Case Studies/Seminar	2	R	30	-
	Total	46			

Note: One to three courses to be selected from the list of recommended courses.

3.9.7 Synopses of Courses in Quantity Surveying Degree Programme

QTS 101: Introduction to Quantity Surveying (2 Units: LH 30)

Historical development of quantity surveying; Functions performed by quality surveyor in relation to construction works; Evolution of standard methods of measurement for construction works; The use of documents in practice; Applied Mensuration: measurement and computation of lengths, girths, areas and volumes both for regular and irregular shapes from drawings Theoretical processes of building contact from inception to completion and the interrelationship of professional team

MTH 201: Mathematics Methods I (3 Units: LH 30)

Real-valued functions of a real variable. Review of differentiation and integration and their applications. Mean value theorem. Taylor series. Real valued functions of two or three variables. Partial derivatives, chain rule, extreme, Lagrange multipliers. Increments, differentials and linear approximations. Evaluation of line integrals. Multiple integrals.

QTS 201: Principles of Measurement and Description I (2 Units: LH 30)

Introduction to methods of communication of data within the construction industry; relationship to their design and construction processes; Bills of quantities: taking off, working up, abstracting and billing; Types of bill format and their uses; Setting out of description and quantitative information in taking off dimension, abstracting and billing sheets; Simple illustrated drawings to demonstrate taking off process.

QTS 202: Principles of Measurement and Description II (2 Units: LH 30)

Substructure: ordinary strip, deep strip and raft foundations to external and internal walls including piers on flat sites; Non-linear foundations: Excavation of tar path, concrete and other pavements excavation in rock and below groundwater level. Substructure: external/internal walls and partitions; Proprietary cladding and partition including curtain walls, non-linear walls and partitions, spot items, preliminary items, provisional sums, prime cost sums; Use of bill diagrams.

PHY 211: Mechanics II (3 Units: LH 30;PH 45)

Rigid body dynamics: moment of inertia, angular momentum, for use. System of particles, moving coordinate system, non-martial reference frames. Focoult's pendulum. Gravitation-gravitational field and potential. Keplar's Newton's law of gravitation. Applications of orbital motion. Reduced mass, impulse, collision in one and 3-dimenisons. System of varying mass, center of mass reference frames. Bending of beams.

MTH 204: Linear Algebra I (2 Units: LH 30)

Vector space over the real field. Subspaces linear independence, basis and dimension. Linear transformations including linear operators, linear transformations singular transformations and matrices. Algebra of matrices.

MTH 205: Linear Algebra II : (2 Units: LH 30)

Systems of linear equations, change of basis, equivalence and similarity. Eigenvalues and eigenvectors. Minimum and characteristics of polynomial of a linear transformation (matrix). Cayley-Hamilton theorem. Bilinear and quadratic forms, orthogonal diagonalisation. Canonical forms.

STA 203: Statistics for Physical Sciences and Engineering (3 Units: LH 45)

Measures of central tendency and dispersion (grouped and ungrouped): mean-arithmetic, geometric, median, mode, qualities, deciles and percentiles. Empirical relation between means, median, and mode relationship and absolute dispersion. Simple space and events as sets. Finite probability space; properties of probability statistical independence and conditional probability. Tree diagram. Bayes theorem. Discrete and continuous random variables. Expectation. Independent Bernoulli trails. Binomial passion and normal distributions. Normal approximation to binomial and Poisson distributions. Hyper geometric.

QTS 301: Measurement of Construction Works I (3 Units: LH 30;PH 45)

Substructure: foundation on site sloping in one direction, simple stepped foundations
Superstructure: upper floors in timber/ concrete; Simple concrete/steel beams; Flat/pitched timber roofs, simple flat concrete roofs, roof trusses Roof coverings: tiles, asphalt, flexible sheets, etc.

QTS 302: Measurement of Construction Works II (3 Units: LH 30;PH 45)

Substructure: complex foundations on sloping sites; Stepped foundations column bases and steel grillage foundations Bulk excavations, basement and swimming pool construction

Superstructure: doors and windows in timber and steel including iron monger, glazing, painting and decorations; Use of doors and window schedules. Stairs in timber including handrails and balustrades

Reinforced concrete structure: stairs, in-situ frames and precast components (including pre-stressed beams and slabs); Use and preparation of bar-bending schedule: Frames and unframed steel structures; their casings, roof trusses; Floor, wall and ceiling finishings; Furniture, standard joinery units, cupboards and shelving, glazed screens, shop fittings, shop front, etc.

QTS 303: Tendering and Estimating I (3 Units: LH 30;PH 45)

Introduction to construction contracting and contractual arrangements in the construction industry; Tendering and the tendering process; Role of different parties involved in tendering; Nature and type of tender documents; Concept of estimating: Derivatives of cost centres for construction works; Categorization of construction works; breakdown of items

QTS 304: Tendering and Estimating II (3 Units: LH 30;PH 45)

Factors affecting build-up rates of construction works; Sources of estimating data: labour constants, basic prices of building and plant items; Computation of rates: excavation and earthworks; concrete works, brickwork and block work; roofing.

QTS 305: Building Economics (2 Units: LH 30)

Construction economy, Its relation to the National economy; Factors affecting the supply and demand for landed property Introduction to methods of evaluation of landed property Construction and use of valuation tables. Rural and urban land use patterns; Property values, premiums, rental values, services charges and operating costs; Introduction to cost control; Principles of cost control systems, cost control techniques and methods. Preliminary estimates, methods of preparing approximate estimates. Establishment of cost targets; Factors involved in the forecasting of future pricing levels; Cost limits: Cost planning principles and types of cost planning methods Presentation of cost plan and formats. Locational theory, concentric zones, and bid rent curves. Urban land values, control of developments

Development planning; Local government Planning Authorities; Public development; Urbanization and associated problems.

SOC 323: Sociology of Urban Life (2 Units: LH 30)

The fundamental features of urban societies; their emergence, development and patterns of growth; The identification, evaluation and utilization of nature and human resources, industrialization, urbanization. Social change in urban societies; Urban social institutions and their adaptation to change; Social area analysis. Issues related to social problems of urban communities: crime, delinquency, and violence; Neighbourhood concept; Rural-urban migration.

ACC 312: Financial Accounting I (2 Units: LH 30)

The course aims at enabling students prepare accounting records for more complex situations than the ones covered by the Introduction to Financial Accounting. At the end of the course students are expected to know: Departmental accounts, branch accounts, joint ventures accounts, consignment accounts, self balancing ledger, lease and royalty accounts, partnership accounts, elements of company accounts, and accounting standards.

ACC 314: Cost Accounting I (2 Units: LH 30)

The course is designed to introduce the students to costing principles and applications of management accounting in both manufacturing and service industries. At the end of the course students are expected to understand: Difference between costing accounting and financial accounting, costing elements, costs classification, installation of costing system, store organization and stock valuation, labour cost control and remuneration schemes, overheads and methods of cost absorption, profit planning through break-even analysis, job/batch costing and contract accounts, service costing, process costing, budgets and budgetary control, standard costing, variance analysis and control, performance evaluation and control, and investment appraisal.

QTS 401: Measurement of Civil Engineering Construction (Works) (3 Units: LH 30)

Scope of civil engineering works and methods of measurement; Site of investigation works and site clearance, excavation, dredging and filling; Geotechnical processes, earthworks, embankment and cuttings; Retaining walls and stabilization of retaining walls piling: concrete piles, timber construction. Simple tunnelling in free air; Large sewers and draining gage sewage treatment installations Sea walls, wharves, jetties and timberwork in connection Power stations, cooling towers, pump-houses and dams: water and gas pipelines; Steel and ironwork, steel framed gantry.

QTS 402: Specification Writing (2 Units: LH 30)

Principles, documentation and uses of specifications; Relationship between specifications, drawing and bill of quantities; Form, order and procedure in writing specifications; use of published format; Introduction to use of preliminary and preamble clauses; Practical approach in specifying building materials and components: Excavation and earthwork; Cement, aggregate; Mild steel; Formwork; Block work and brickwork; Metal and structural steel work; Carpentry; Joinery; Roofing; Asphalt work; Finishings; Glazing; Plumbing work; Electrical work; Fencing.

QTS 403: Research Methods I (3 Units: LH 45)

The course aims at enabling students acquire and apply field and statistical skills necessary for the conduct and evaluation of research problems. At the end of the course students are expected to understand: Identification of research problems, choice of researchable topics, research design, writing of proposals, methods of data collection, description of materials and methods in experimental research.

ACC 413: Financial Management (4 Units: LH 60)

It is expected that the course will inculcate in the students the working of the Nigerian financial system, competence to evaluate alternative courses of action, ability to consider optimum deployment of resources, ability to judge performance, and competence to assess investment possibilities. At the end of the course students should understand :

Nigerian financial system, financial reports, working capital management, dividend policy, cost of capital, capital investment appraisal, valuation of the firm, theory of capital structure, business failures and liquidation, re-organization of businesses, mergers and acquisition, and financing of small business.

ACC 415: Management Accounting (3 Units: LH 45)

The aim of this course is to create in the students the ability to prepare and analyze accounting data for management policy determination and ability to design and control systems for planning and control. At the end of the course students are expected to understand: Meaning and purpose of management accounting, management accounting as a tool for management, organization of management accounting department, costing techniques, budgets and budgetary controls, standard costing, information for decision making, performance evaluation and control, capital investment appraisal, risk and uncertainties.

ACC 416: Taxation and Tax Management (3 Units: LH 45)

The course is designed to provide the students with the understanding of the Nigerian tax system. At the end of the course students should understand: General principles of taxation, personal income administration, income tax regulation in Nigeria, company income tax system, tax reliefs, capital gains tax, petroleum tax, capital tax transfer, provision of industrial development Act, computation of various types of taxes, tax system in ECOWAS, and tax policy in different industries.

BUS 433: Marketing Research (3 Units: LH 45)

A study of the theory and application of marketing research is undertaken, including why market research is done and how it is used. The components of effective marketing research including proposals, research design, questionnaire design, data collection, data analysis and interpretation of results are introduced and applied in real-life situations. Students are expected to understand how to use and evaluate various on-line sources of business information such as the Internet, statistical, dialogue and trade publications.

BUS 420: Economics of Production (3 Units: LH 45)

Nature and scope of Economics of Production; Production functions and costs; Industrial location; Production planning and control; Plan layout and raw material handling; Quality control; Inventory management; Methods of analysis, work measurement and incentive plans.

BUS 444: Marketing Management (3 Units: LH 45)

The role of marketing in today's organization. Tasks and philosophies of marketing management; the marketing system applications to Nigeria; The distributions structure, physical distribution. Promotional strategy; Decisions; Brand strategy decisions, pricing decisions, and policies. The various concepts of marketing in different organizations, market planning – long range planning, strategies, analysis, the 4 p's of marketing; Planning organization, directing and controlling marketing efforts.

QTS 404: Student Industrial Work Experience Scheme (SIWES)

(15 Units: PH 675)

Attachment with industries, institutions, organizations for one semester for the acquisition of practical skills and experience of the concepts learnt and knowledge acquired in the basic elements, principles and practice of quantity surveying.

QTS 501: Measurement of Construction Works (Services and Equipment)

(3 Units: LH 30 PH 45)

Rainwater and sanitary installations; Cold and hot water installations; Heating, ventilating, and air-condition installations; Fire fighting and hydraulic installations; Compressed air and gas installations. Pipe work, ductwork, equipment, and installation sundries in electrical installations; Equipment and control gear, conducts, trucking, cables and conductors, fittings and accessories grouped according to power distribution; Lighting, heating, ventilation and air-conditioning, telephones Clocks, sound-distribution, signals, fire-alarms, burglar alarms, earthing conductors and lighting conductors.

QTS 502: Advanced Cost Control I

(3 Units: LH 45)

Critical appraisal of cost planning and control methods; Evaluation of alternative engineering systems. Cost geometry, modelling application of operational research procurement, storage, retrieval and utilization of cost information.

QTS 503: Advanced Cost Control II

(3 Units: LH 45)

Capital budgeting programming and control of public expenditure; Investment appraisal: expected returns and cash flow, profitability index, risk analysis, feasibility studies, cost-benefit analysis, value analysis; Appraisal of large-scale development schemes.

QTS 504: Professional Practice and Ethics

(2 Units: LH 30)

Mobilization of contractors to site; Assessment of preliminaries; Valuation of interim certificates; preparation of sub-contractors' account and hard works – completion, defects and the final accounts; Determination and termination of accounts; Final account measurements, preparation of claims and reports. Practical interpretation of contract conditions; Arbitration principles of professional ethics; Practice procedures for quantity surveyors; Educational requirement for professional training; Joint consultative council for professionals in construction Industry. The role of Quantity Surveying Registration Board of Nigeria; Quantity surveying functions; Quantity surveyor construction period as it affects valuations, preliminaries, fluctuations, variation orders and accounts, provisional cost, and provisional sum.

QTS 505: Contract Administration I

(2 Units: LH 30)

Nature, classification, formation and essentials of contracts; offer and acceptance, implied terms, mistakes and misrepresentation; Capacity of parties: Void and voidable and illegal contracts and agency; Contracts of employment features, termination, relationship and duties of parties; Third party rights and responsibilities, enforcement and remedies.

QTS 506: Contract Administration II

(2 Units: LH 30)

Types of contract: lump sum, schedule, cost reimbursement etc. Definition of 'work', meaning of completion, sectional completion, time for completion, extension of time; Defects and maintenance clauses – liabilities of contractors, sub-contractors and suppliers, warranties, insurances, exclusion clauses, tortuous liability; Payments to contractors, purpose, types, form and achievement. Bankruptcy and insolvency – position of parties in absence of express provision, regulatory classes and statutory conditions; Breach of contract – types of breach by employer and contractors, remedies, measures of damages, forfeiture clause, specific performance etc; Liabilities of professional advisers.

QTS 507: Computer Application to Quantity Surveying (2 Units: LH 30)
Data processing; Quantity surveying software packages; Contract planning packages; Estimating packages; Cost planning modeling; Contract documentation and contract administration packages.

QTS 508: Measurement of Alteration and Maintenance Works (3 Units: LH 30)
Measurement principles applicable to alteration, renovation and maintenance works: Demolition, Conversion, Extension/rehabilitation, Schedule of dilapidation, Interior decoration and furnishings, Landscaping and horticultural works, and Spot items.

QTS 509: Research Method II (3 Units: LH 45)
The course will continue from where Research Method I stopped and begin inferential analysis. At the end of the course students are expected to understand: formulation of hypothesis; testing of hypothesis; concept of significance, and statistical measures for data analysis; Application of inferential statistical methods: Time series; Correlation; Regression; Student's t-test; Chi-square; Analysis of variance (ANOVA); and research report writing.

QTS 510: Professional Practice and Procedure (3 Units: LH 30PH 45)
The course introduces the students to business practice including, liability issues, safety in the workplace, ethical considerations faced by technical personnel in professional practice and issues of engineering economy in quantity surveying. Other topics include: the roles of the regulatory bodies in professional building practice with emphasis on the roles of the builder, his/her obligations to the client, society and other consultants in ethical practice.

QTS 511: Case Studies/Seminar (2 Units: LH 30)
Case studies of construction related problems; Case studies of problems of the built-up environment; Case studies of innovations in building construction materials, technology management. Students are expected to write and present papers on specified topics in a seminar.

QTS 590: Project Dissertation (6 Units: LH 270)
This course will involve an investigation of a topical issue relating to the various branches of the quantity surveying profession in Nigeria. Each student is expected to work on an independent basis. The objective of the dissertation is to develop the capacity of the student to carry out an in-depth investigation. The student must understand and define the topic, survey previous work on the topic, make meaningful appraisal and present findings in a precise and coherent order, using acceptable tools of investigation and reports writing. Students are expected to provide scientifically based researches into various aspects of a general construction as well as construction economics e.g. finance, labour, materials, plant and equipment, bills of quantities of various types, tender analysis, public works and budgeting.

3.10 SURVEYING & GEOINFORMATICS DEGREE PROGRAMME

3.10.1 Introduction

Surveying is the science that provides the spatial location of the earth's features and other environmental information, necessary for map production, designing engineering works, planning, location and exploitation of natural resources, as well as land administration. It is a multi-disciplinary subject which serves as foundation discipline in engineering (particularly civil engineering), environmental studies, analysis and planning. Geoinformatics is an integrated process for map and geo-information production through the supporting technologies of photogrammetry, remote sensing, cartography and computer science.

The last decade has witnessed dramatic changes in the field of surveying. Recent advances in computer and space technologies have revolutionized the methods of collection and dissemination of geodata and geoinformation products. As a result, the classical analogies method is giving way to the more modern digital methods in both data acquisition, processing and presentation. These changes have propelled surveyors to change their way of doing things and to expand their scope of activities. Consequently, the term surveying no longer, adequately describes all their activities and products. The nomenclature adopted by some Surveying Departments and organizations (in Europe and some Commonwealth countries) are geoinformatics or geomatics. In pursuance of this, universities offering "Surveying" as a programme may adopt the nomenclature of Surveying and Geoinformatics.

The student should be exposed to all the basic instrumentation especially those equipment she/he would meet in his working life time to imbibe necessary skills and competence.

Philosophy

The philosophy of the programme is to expose students to the essential academic and practical training needed to make him/her grow into full and well-qualified professional who is abreast with technological advancements in the field of Surveying and Mapping and to inculcate in the student Entrepreneurial and managerial skills geared towards self-employment.

3.10.2 Aims and Objectives

The Programme is intended to

- a) Produce Surveyors or Geoinformatics experts with sound knowledge in the theory and practice of the key areas of the discipline including land surveying, hydro graphic surveying, geodesy, photogrammetry and remote sensing, cartography and geospatial information management.
- b) Ensure adequate knowledge of mathematics, physics, computer science, environmental management and protection, law, finance and management studies need by surveyors.
- c) Provide students with a broad and balanced foundation in theoretical and practical skills.
- d) Develop in students the ability to apply theoretical and practical knowledge of surveying and geoinformatics in solving environmental problems

- e) Provide students with knowledge and skills base from which they can proceed to further studies in the specialized areas related to the study of Surveying and Geoinformatics.

3.10.3 Duration of Programme

The duration of the surveying and geoinformatics course is a minimum of ten (10) academic semesters for UTME candidates.

3.10.4 Admission Requirements

The modes of entry into the programme will include:

UTME Admission: Holders of Senior Secondary School Certificate (SSSC) or its equivalent with credit in at least five subjects, in not more than two sittings including Mathematics, Physics and English Language may gain entry into the programme. The Any two of the following course are required; Geography, Technical drawing, Fine Arts, Chemistry, Biology, Economics, Agricultural Science

Direct Entry Admission: Candidates who satisfy the UTME requirements and in addition have G.C.E. (A/Level) passes in Mathematics and Physics and any of Geography, Technical drawing, Fine Arts, Chemistry, Biology, Economics, Agricultural Science or who hold a National Diploma in a related discipline may be admitted into 200 level. Holders of HND in surveying and geoinformatics with at least an upper credit plus O' level requirements may be admitted into 300 level of the programme.

3.10.5 Graduation Requirements

UTME Admission students will be required to have taken and passed all compulsory and minimum number of prescribed required course totalling at least 180 credits to qualify for graduation.

3.10.6 Learning Outcomes

Graduate of this this programme is expected to demonstrate the following in terms of knowledge, skills and attitude:

- Practical skills needed in making relevant measurements (with modern equipment) to such a standard that will qualify him or her to practice the profession in all the key areas of the discipline.
- Skills required for the conduct of standard field procedures using modern survey equipment.
- Skills in the monitoring by observation and changes and the systematic and reliable recording and documentation thereof.
- Competence in planning, design and execution of mapping or Geoinformation projects from the beginning to an end. This will include the ability to select and appropriate techniques and procedures.
- Skills in the operation of standard surveying and Geoinformatics instruments under production conditions.
- Ability to analyse and transform data obtained from different data acquisition systems.

3.10.7 Instructional modules

It is expected that all programmes will ensure that students become conversant with the main aspects or key areas in Surveying and Geoinformatics. The key areas (which form the body of knowledge to be acquired by the undergraduate) are as follows:

Foundation and Support Courses

These should include General Studies (English Language, Social Sciences and Humanities), General and Advanced Mathematics, General and Advanced Physics, Computer Science (Basic Computer Programming), Statistics, Adjustment Computations, Geology and Geophysics, Economics, Accounting and Management, Urban and Regional Planning, Environmental Management and Protection, Entrepreneurship, Health and physical Education (swimming).

- a) Land Surveying
- b) Hydrographic Surveying
- c) Geodesy
- d) Photogrammetry and Remote Sensing
- e) Cartography
- f) Survey Laws, Regulations and Professional Practice
- g) Geographic Information Systems

3.10.8 Resource requirements for teaching and learning

See Section 1.6

3.10.9 Courses for Surveying and Geoinformatics Degree Programme Courses at 100 level Surveying and Geoinformatics

100-LEVEL SURVEYING AND GEOINFORMATICS					
Course Code	Course Title	Units	Status	LH	PH
GST 111	Communication in English I	2	C	30	-
GST 113	Nigerian Peoples and Culture	2	R	30	-
MTH 101	Elementary Mathematics I	3	R	45	-
PHY 101	General Physics I	3	C	45	-
PHY 107	General Physics Laboratory I	2	C	-	90
GST 112	Logic, Philosophy and Human Existence	2	R	30	-
GST 121	Use of Library, Study skills and ICT	2	C	30	-
GST 122	Communication in English II	2	C	30	-
MTH 102	Elementary Mathematics II	3	C	45	-
PHY 102	General Physics II	3	C	45	-
BUD 103	Technical Drawing	2	C	30	-
SGI 105	Elementary Land Surveying I	3	C	45	-
CMS 101	Introductory Computer Science	2	C	30	-
GEO 103	Introduction to Practical Geography	4	R	60	-
MTH 103	Elementary Mathematics III	3	R	45	-
GLY 102	Introduction to Minerals and Rocks	3	R	45	-
GEO 107	Introduction to Landuse Planning	3	R	45	-
ARC 112	Planning and the Built Environment	2	R	30	-
ARC 122	Freehand and Life Drawing	2	R	30	-
GEO 106	Introduction to Environmental Science	2	R	30	-
	Total	50			

* Note: register at least 1 course from recommended courses to earn minimum 36 credit units

Courses at 200 level Surveying and Geoinformatics

200-LEVEL SURVEYING AND GEOINFORMATICS					
Course Code	Course Title	Units	Status	LH	PH
GST 211	Environment and Sustainable Development	2	R	30	-
GST 222	Peace and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
GEO 206	Elementary Cartography	3	C	45	-
STA 203	Statistics for Physical Sciences and Engineering	3	R	45	-
SGI 201	Topographic Surveying	3	C	30	45
SGI 202	Cadastral Surveying I	3	C	30	45
SGI 203	Geodetic Surveying	3	C	30	45
SGI 204	Geometric Photogrammetry	2	C	15	45
SGI 205	Cadastral Surveying II	2	C	15	45
SGI 206	Computer Application to Surveying	2	R	15	45
GEO 204	Map Analysis	3	R	45	-
SGI 207	Electronic Surveying	3	R	45	-
SGI 208	Electronic Engineering	2	R	30	-
URP 205	Planning Principle and Practice	4	R	60	-
URP 209	Environmental Planning and Management	3	R	45	-
URP 214	Urban Land Economics I	2	R	30	-
MTH 209	Introduction to Numerical Analysis	3	R	45	-
CMS 201	Computer Programming I	4	R	30	90
CMS 203	Introduction to Computer Systems	2	R	15	45
	Total	53			

* Note: register at least 2 courses from recommended courses to earn minimum 36 credit units

Courses at 300 level Surveying and Geoinformatics

300-LEVEL SURVEYING AND GEOINFORMATICS					
Course Code	Course Title	Units	Status	LH	PH
SGI 301	Analogue Photogrammetry	3	C	30	45
SGI 302	Remote Sensing	3	C	30	45
GEO 313	Geographic Information Systems I	2	C	15	45
STA 324	Survey Methods and Sampling Theory	3	C	45	-
SGI 303	Mining and Special Survey I	3	C	30	45
SGI 304	Mining and Special Survey II	3	C	30	45
SGI 305	Cadastral Surveying III	3	C	30	45
SGI 307	Adjustment Computation I	2	C	30	-
MTH 308	Introduction to Mathematical Modelling	3	R	45	-

MTH 318	Numerical Analysis I	3	R	45	-
SGI 319	Land Surveying	3	R	30	45
CMS 202	Computer Programming II	3	R	45	-
CMS 301	Introduction to Digital Design and Microprocessor	4	R	30	90
CMS 306	Systems Analysis and Design	2	R	30	-
CMS 310	Numerical Methods I	2	R	30	-
CMS 312	Operations Research	2	R	30	-
GEO 312	Cartography	2	R	30	-
GEO 320	Terrain Evaluation	3	R	45	-
PHY 361	Electronics I	3	R	30	45
PHY 382	Introduction to Geophysics	2	R	30	-
GST 311	Entrepreneurship	2	R	30	-
	Total	56			

* Note: register at least 2 courses from recommended courses to earn minimum 36 credit units

Courses at 400 level Surveying and Geoinformatics

400-LEVEL SURVEYING AND GEOINFORMATICS					
Course Code	Course Title	Units	Status	LH	PH
SGI 401	Hydrographic Surveying I	3	C	30	45
SGI 403	Entrepreneurship Studies	2	C	30	-
SGI 404	Analytical Photogrammetry	3	C	30	45
SGI 405	Physical Geodesy	3	C	45	-
SGI 406	Research Methods I	3	C	45	-
SGI 407	Adjustment computation II	2	C	30	-
GEO 415	Geographic Information Systems II	3	R	30	45
GEO 413	Environmental and Resources Management	3	R	45	-
SGI 409	SIWES	18	R	24 weeks	
SGI 402	Marine Surveying	3	R	30	45
SGI 41I	Remote Sensing II	3	R	30	45
PHY 461	Digital Electronics II	3	R	30	45
SGI 408	Engineering survey	2	R	15	45
SGI 410	Advanced Land Surveying	3	R	30	45
	Total	54			

* Note: register at least 2 courses from recommended courses to earn minimum 36 credit units

Courses at 500 level Surveying and Geoinformatics

500-LEVEL SURVEYING AND GEOINFORMATICS					
Course Code	Course Title	Units	Status	LH	PH
SGI 501	Aerial Triangulation	3	C	30	45
SGI 502	Geometric Geodesy	3	C	30	45
SGI 503	Hydrographic Surveying II	3	C	30	45
SGI 504	Cadastral Surveying IV	3	C	30	45
SGI 505	Computational Photogrammetry	3	C	30	45
SGI 506	Satellite Geodesy	3	C	30	45

SGI 508	Research Method II	3	C	45	-
SGI 509	Project Dissertation	6	C	-	270
SGI 510	Electronics Surveying	3	R	30	45
URP 517	Environmental Law	2	R	30	-
URP 520	Politics of Development	2	R	30	-
EVM 504	Soil Erosion and Environmental Management	3	R	45	-
EVM 508	Environmental Impact Assessment	3	R	45	-
EVM 509	Environmental Audit	3	R	45	-
	Total	43			

* Note: register at least 3 courses from recommended courses to earn minimum 36 credit units

3.10.10 Synopses Courses in Surveying and Geoinformatics

SGI 105: Elementary Land Surveying I (3 Units: LH 45)

Fundamentals of Surveying (Definition, Plane Surveying, Geodetic surveying, Branches of Surveying, Basic principles, Fieldwork and office work, Scales, Mistakes and errors, and accuracy. Chain Surveying (Equipment, ranging and chaining, reciprocal ranging, well conditioned triangles, Errors in linear measurement and their corrections, Fieldwork, Office work, Obstacles. Compass Surveying And Plane Table Surveying, Compass, Types, Bearing, systems, Local attraction, Magnetic declination, Dip, Traversing, Plotting, Adjustment of error, Plane table; Instruments and accessories, Merits and demerits, Methods, Radiation, intersection, resection, traversing. Levelling (Level line, Horizontal line, Datum, Levels and staves, Bench marks, temporary and permanent adjustments, Check leveling, Procedure in leveling, Booking, Reduction, Curvature and refraction. Reciprocal leveling, Longitudinal and Cross section, Plotting, Contouring Methods Characteristics and uses of contours, Plotting. Areas And Volumes (The Planimeter – Areas enclosed by straight lines, Irregular figures.

CMS 101: Introduction to Computer Science (2 Units: LH 30)

History of Computers, functional components of Computer, Characteristics of a computer, problem solving, flow charts Algorithms, computer programming statements, symbolic names, Arrays, subscripts, expressions and control statements. Introduction to Basic or Fortran Programming Language, Computer Applications.

GLY 102: Introduction of Minerals and Rocks (3 Units: LH 45)

The major rock-forming minerals, their chemistry, structure, and physical properties. Introduction to igneous, Sedimentary and Metamorphic rocks, the main types, their composition and modes of formation. Brief account of their economic importance. Minerals, energy, water, building and engineering properties in the field study of locally occurring rock type.

STA 203: Statistics for Physical Sciences and Engineering (3 Units: LH 45)

Measures of central tendency and dispersion (grouped and ungrouped): mean-arithmetic, geometric, median, mode, qualities, deciles and percentiles. Empirical relation between means, median, and mode relationship and absolute dispersion. Simple space and events as sets. Finite probability space; properties of probability statistical independence and conditional probability. Tree diagram. Bayes theorem. Discrete and continuous random

variables. Expectation. Independent Bernoulli trials. Binomial distribution and normal distributions. Normal approximation to binomial and Poisson distributions. Hypergeometric.

SGI 201: Topographic Surveying (3 Units: LH 30)

Definition and use of topographic Maps, Scale and Precision, Methods of obtaining field Data for topographic mapping. Methods of Representation, Planning of control Surveys, Instruments, Location of details, Field procedures and observations. Electronic positioning system, Uses of Digital Terrain Model (DTM) and Digital Elevation Model (DEM), Modern Trends.

SGI 202: Cadastral Surveying I (3 Units: LH 30, PH 45)

Field methods and office preparations for property surveys. Principles and regulations governing the demarcation and survey of properties boundary, Layouts. Origins, re-establishment of beacons. Gross errors in traverse. Cadastral Survey Records. Procedures in dispute surveys, process of registration and professional conduct of surveyors.

SGI 203: Geodetic Surveying (3 Units: LH 30, PH 45)

Higher order Surveying instruments: Use, Care, accuracy, Control Surveys. Design of 1st and 2nd order control systems. Positioning methods. Precise leveling. Computations of geodetic positions. Semi-rigorous and rigorous adjustment of control networks.

SGI 204: Geometric Photogrammetry (2 Units: LH 15 PH 45)

Stereoscopy and Parallax Relative and Absolute Orientation. Projective equations for the line, plane and space. Rotation equations. Co linearity and Co planarity condition equations. Projective transformation equations. Single Photo resection.

SGI 205: Cadastral Surveying II (2 Units: LH 15, PH 45)

History and methods of dealing with land tenure systems in Nigeria. Customary land tenure systems in Nigeria. Rights and interests in land. Land registration systems, Deeds and Title Registration. Defeats of Deeds Registration. Title Registration, registered Land Act and land Use Act 1978. Comparative cadastral Systems. Organization and procedure for Cadastral Surveys.

SGI 206: Computer Applications in Surveying (2 Units: LH 15)

Introduction to basic computing, overview of hardware and software systems. Emphasis is placed on the use of selected applications for storage, retrieval and analysis of spatial data, internet use. Basic Computer Maintenance.

SGI 207: Electronic Surveying (3 Units: LH 45)

History of electronic surveying. Properties of electronic waves. Group velocity, transmitters, receivers and antennal EDM Equipment Systems. Errors - instrumental and atmospheric. Interferometric methods of baseline measurements.

SGI 208: Electronic Engineering (2 Units: LH 30)

CSC 201: Computer programming I (4 Units: LH 30; PH 90)

Introduction to computer programming, Basic language, Fortran language. Flowcharts, Data structures and Algorithms

CSC 203: Introduction to Computer Systems (2 Units: LH 15;PH 45)

Computer structure, machine language; Assembly language; Addressing Techniques, Macros, File I/O assemble segmentation and linkages assembler construction; interpretive routines.

SGI 301: Analogue Photogrammetry (3 Units: LH 30;PH 45)

Projective Relations in Phogrammetry. Differential formulae. Relative and Absolute Orientation. Model Deformations. Plotting of stereo Model. Stereo Plotting Instruments. Ground Control in Photogrammetry. Analogue areal Triangulation.

SGI 302: Remote Sensing II (3 Units: LH 30;PH 45)

Sensors, electro-optic and microwave imaging systems. Radar orbiting remote-sensing satellites – LandSat, Spot. Characteristics of Images, Data Import and Export, Image analysis (Visual interpretation & Digital processing) - Temperature, depth and aerial estimation by remote sensing. Manual and automated image interpretation and classification. Accuracy of classification. Presentation of remote sensing data.

STA 324: Survey Methods and Sampling Theory: (3 Units; LH 45)

Survey design, planning and programming. Methods of data collection. Design of form and questionnaires. Data processing, analysis and interpretation. Errors and biases, Probabilities and non-probability sampling: selection procedure. Estimation of mean, totals, ratios and proportions in simple random, systematic, stratified cluster and two-stage sampling. Probability proportion-to-size sampling. Nigeria's experience in sampling survey.

SGI 303: Mining and Special Surveys (3 Units: LH 30;PH 45)

Definitions. Mining and underground surveying Techniques. Design of underground survey networks. Mine orientation, mechanical and optical shaft plumbing gyroscopic methods, laser etc, Accuracies. The gyrotheodolite. Sources of errors. Volume determination. Erosion problems, Crustal movements. Survey for subsidence and stability of large structures.

SGI 304: Mining and Special Surveys II (3 Units: LH 30;PH 45)

SGI 305: Cadastral Surveying III (3 Units: LH 30;PH 45)

Property Law. Nigeria survey laws and Regulations. Chapter 194 of the laws of the Federation and other relevant survey Legislations decrees and their amendments. Survey Laws in mining Surveys. Rights of way. Town Planning Laws etc. Land Use Act. Land Information Systems.

SGI 307: Adjustment Computation I (3 Units: LH 30)

Basic concepts in theories of error, principles of least squares, adoption of least squares estimation as basis for adjustments of survey. Adoption of normal equations in parametric adjustments. Adjustments of secondary triangles by least squares. Reduction of geodetic levels and adjustment of level nets by least squares. Partitioning of matrices, condition, and observation equations. Combined method. Weight estimations. Applications in Surveying and Photogrammetry.

CMS 202: Computer Programming II (3 Units: LH 45)

Principles of Good Programming; Structured Programming concepts, Debugging and testing; string processing, Internal searching and sorting, Data Structures, Recursion. Use a programming Language difference form that in CS 201.

CMS 301: Introduction to Digital Design and Microprocessor (4 Units: LH 30)

Combinatorial logic, sequential logic, Microprocessors and Microcomputers.

CMS 306: Systems Analysis and Design (2 Units: LH 30)

Introduction to system design; analysis tool, determining system alternatives physical design of computer sub-systems: Physical design of manual sub-system, special design of features.

CMS 310: Numerical Methods (2 Units: LH 30)

Floating-point arithmetic, use of mathematical subroutine packages; interpolation, approximation, numerical integration and differential; solution of non-linear equations, solution of ordinary differential equations.

CMS 312: Operations Research (2 Units: LH 30)

The nature of operations research, allocation problems, inventory problems; replacement, maintenance and reliability problems. Dynamic programming, sequencing and co-ordination.

SGI 319: Land Surveying (3 Units: LH 30 PH 45)

Angular measurements, distance measurements and Control Survey methodology. Using - Theodolite Surveying (Types, Description and uses, Temporary and Permanent adjustments of vernier transit, Horizontal angles vertical angles, Heights and distances Traversing, Closing error and distribution, Gale's tables, Omitted measurements, Laser attachment). Tacheometric Surveying (Tacheometric systems, Tangential, Stadia and Subtense methods, Stadia systems, Horizontal and inclined sights, vertical and normal staffing, fixed and movable hairs, stadia constants, Anallactic lens and Subtense bar). Control Surveying (Horizontal and Vertical control, Methods, Triangulation, Signals, Base line, Instruments and accessories, Corrections, Satellite station, Reduction to centre, Trigonometric leveling, Single and reciprocal observations, Precise leveling, Types of instruments, Adjustments, Field procedure. Hydrographic Surveying (Tides, MSL, Sounding and methods, Location of Soundings and methods, Three-point problem, Strength of fix, Sextants and station pointer, River Surveys, Measurement of current and discharge. Topographic Surveying, Scale and Precision, Methods of Representation, Planning, Instruments, Location of details, Electronic positioning system, Uses of Digital Terrain Model (DTM) and Digital Elevation Model (DEM)– Modern Trends.

SGI 401: Hydrographic Surveying I (3 Units: LH 30;PH 45)

Hydrography. Z-dimensional positioning at sea and on water. Depth determination. Tides, MSL, Sounding and methods, Location of Soundings and methods, Three-point problem, Strength of fix, Sextants and station pointer Positioning Accuracies. Measurement systems. Sources of errors. Introduction to satellite. Navigation and positioning Tides and Tidal Streams. Chart and sounding datums. Mean sea level determination. Tide gauge and poles. River Surveys, Measurement of current and discharge

SGI 402: Marine Surveying

(3 Units: LH 30 & PH 45)

Coastal engineering. Situation and erosion. Coastal zone Management. Demarcation of Harbours, harbour laws. Position Fixing. Large scale surveys Dredging. Effects of wind and wave on sea bed. Oceanographic equipment. Tidal current Measurement.

SGI 403: Entrepreneurship Study II

(2 Units: LH 30)

Students will learn a broad array of tools to more efficiently manage scarce resource in a venture. Applied approaches to asset and liability management.

SGI 404: Analytical Photogrammetry

(3 Units: LH 30 & PH 45)

Refinement of comparator measurements. Calibration of the Camera, the comparator and the stereoplotter. Colinearity Equations. Coplanarity condition equations, Errors, Weights.

SGI 405: Physical Geodesy

(3 Units: LH 45)

The Earth and its gravity field. Potentials. Gravity anomalies. Geoidal undulations, and deflections of the vertical height systems. The earth, its size and shape. Geoid as figure of the earth. Other approximations. Stoke's and Vening-Meinesz's formulas. Disturbing potential in spherical harmonics. Gravity observations and reductions. Absolute and relative gravity measurements.

SGI 406: Research Methods I

(3 Units: LH 45)

Introduction to research methods in Surveying and Geoinformatics. Selection of a research topic; definition of study problems and objectives; Formulation of research hypotheses; Experimental design for collection and analysis of data; writing a research proposal.

SGI 407: Adjustment Computation II

(2 Units: LH 30)

Generalized least squares model. Linear, and non-linear models. Solution of Normal Equations Treatment of large geodetic networks. Addition of observations and parameters. Removal of observations. Application of constraints. Statistical Analysis. Error ellipse and error ellipsoid. Apply the full capabilities of programmable calculators. Applications in surveying and photogrammetry.

SGI 408: Engineering Surveying

(3 Units: LH 15;PH 45)

Location and setting out of works. Principles of curve ranging and setting out (compounds and reverse curves, transition curves and vertical curves). Sectioning. Areas and Volumes. Construction site surveys. Mining surveys. Methods of surveying underground installations. Methods of deformation and small movements. Engineering Geodesy. applications of modern instruments and techniques in engineering surveying.

SGI 409: SIWES

(15 Units: PH 675)

Students are expected to spend six months of the second semester of four hundred level on industrial attachment in any relevant organization of their choice. They are to participate in activities of all aspects of surveying and geoinformatic. A technical report is expected to be submitted for assessment after an oral defense has been completed by the students.

SGI 410: Advanced land surveying

(3 Units: LH 30;PH 45)

The knowledge working principles and adjustments in the use of precise Theodolites, total station, level, EDM instruments, astrolabes, sextants and echo-sounders, lasers and the GPS.

SGI 411: Remote Sensing II

(3 Unit; LH 30;PH 45)

Remote Sensing analytic digital image processing system. Fundamentals (Computers imaging systems, image representation- colour space, image sampling quantization, quality measurement, data products, storage and retrieval- Photowite systems, dip systems and software. Preprocessing (Encoding and decoding, sources of image degradation, atmospheric, radiometric and geometric errors, systematic and non-systematic correction, image geometry operations. Image Enhancement (Image characters, histogram, scatter plots, statistics and spatial statistics for processing, image models, spatial transforms, enhancements: radiometric and geometric operators, Fourier transforms, scale space transforms, image fusion, texture analysis. Image Classification (Spectral discrimination pattern matching Baye's theorem- signature and feature extraction- training and classification, supervised and unsupervised methods error matrix and accuracy estimates. Image Analysis (Concept of uncertainty, fuzzy partitioning, neural nets, sub-pixel classification concept, pattern recognition, feature descriptors). Remote sensing application, Integration of Remote Sensing and GIS in geographical research, case studies.

PHY 461: Digital Electronics

(2 Units: LH 30;PH 45)

Number representation in binary octal, hexadecimal and denary. Codes - BCD, Hamming, Gray. Parity check and alphanumeric. Conversion between gates. Basic logic equations and Boolean algebra. Karnaugh mapping. Basic logic gates, truth tables. Logic design and realization. Flip-flops, counters and shift registers. Digital logic families. Memory devices and backups – primary and secondary.

SGI 501: Aerial Triangulation

(3 Units: LH 30;PH 45)

Analogue Aerotriangulation. Strip formation. Strip and Block adjustment. Perspective Centre determination. Independent model aerotriangulations. Multiple photo resection. Bundle Adjustment of photographs. Flight Planning.

SGI 502: Geometric Geodesy

(3 Units: LH 30;PH 45)

Historical development and aims of Geodesy. Geometry of an ellipse. Latitudes. space-rectangular coordinates. Radii of curvature. Lengths, and areas on ellipsoid. Curves on the ellipsoid. Normal Sections and Geodesics. Direct and inverse Problems on sphere and ellipsoid. Geodetic datum, and ellipsoid as reference surface. Data transformation from one datum to another.

SGI 503: Hydrographic Surveying II

(3 Units: LH 30;PH 45)

Sounding Wave propagation. Acoustic waves. Sweeping, side – looking sonar. Multibeam sonar. Electronic sweeping. Elements of Oceanography. Tides and currents. Temperature, Salinity, sedimentation and beach erosion modern techniques.

SGI 504: Cadastral Surveying IV

(3 Units: LH 30 PH 45)

Professional Practice. Professional body. Control of the profession. Code of ethics. Costing of Cadastral, topographical Engineering and Hydrographic Surveys. Costing of mapping projects.

SGI 505: Computational Photogrammetry

(3 Units: LH 30 PH 45)

Review of least squares application in photogrammetry. Collinearity and Coplanarity concepts and least squares methods in relative orientation. Bundle adjustment. Systematic effects in photogrammetry. Computer applications.

SGI 506: Satellite Geodesy

(3 Units: LH 30 PH 45)

The geometrical and dynamical applications of artificial satellites to position and earth's figure and gravity field determination.

SGI 508: Research Method II

(3 Units: LH 45)

A Review of methodologies in Land Survey/Geoinformatic. Area delineation of data source, Cartographic design, creation of research instruments, techniques in research methods. Formal acquisition of data, appropriate statistical analyses, presentation of research finding and conclusion, referencing and appendixes.

SGI 509: Project Dissertation

(6 Units: LH 90)

Articulate all aspect of Survey and Geoinformatics that is of interest. Know how to procure, analyze and document data. Produce a standards report on the project explaining the theoretical and practical processes gone through.

SGI 510: Electronic Surveying

(3 Units: LH 30;PH 45)

To understand the working of EDM equipment and solve the surveying problems with an EDM equipment. Fundamentals of EDM (Methods of Measuring Distance, Basic Principles of EDM, Historical Development, Classifications, applications and comparison with conventional surveying). Basic Electronics (Oscillators (Crystal controlled and Gunn diode) - Kerrcell / Pockel's modulator, Frequency mixing - modulation and Demodulation - Measurement of phase, differences - reflectors (Corner, Antenna) - Transducers and power sources). Electromagnetic Waves (Classification and applications of Electromagnetic waves, Propagation properties, wave propagation at lower and higher frequencies. Refractive index, factors affecting RI, Computation of group refractive index for light and near infrared waves at standard conditions and ambient conditions. Computation of RI for microwaves. Reference refractive index. Real time application of first velocity correction. Measurement of atmospheric parameters. Mean refractive index, Second velocity correction, Total atmospheric correction, Use of temperature and pressure transducers). Electromagnetic Distance Measuring System (Electro-optical system: Measuring principle, Working principle, Sources of Error, Infrared and Laser EDM instruments. Microwave system: Measuring principle, Working principle, Sources of Error, Microwave EDM instruments. Comparison between Electro-optical and Microwave system. Total station and its applications. Care and maintenance of EDM instruments. Modern positioning systems). Field Work (Study of different EDM instruments and Total station - Setting out works - Base line Measurement, EDM traversing: observations and computation of area, Trilateration.

3.11 URBAN AND REGIONAL PLANNING DEGREE PROGRAMME

3.11.1 Introduction

Urban and Regional Planning is the Art and Science of ordering and managing land uses, environment, based on detailed understanding and analysis of societal needs, within the socio-economic, environmental management framework.

It is concerned with the formulation of design, implementation and monitoring of land use plans, policies at the Local, Urban and Regional levels, and environmental management through information technology and entrepreneurship for effective development.

It is a broad-based discipline, requiring a multi-disciplinary approach and knowledge, therefore requires a comprehensive education and training in the planning, design and management of the total environment.

3.11.2 Aims and Objectives

The Aims and Objectives of the programme are:

- a) To produce competent professional Town Planners who will meet the critical manpower needs of the country in the management of both urban and rural space.
- b) To produce town planners with multi-disciplinary skills and competence in both design and in socio-economic analysis through the blend of theory, design skills, analysis and practice. In this regard, professionals in other related fields, for example, Architecture, Building, Law, etc., will contribute in teaching in the programme.
- c) To produce town planners who can operate effectively in the environmental management using Urban and Regional Planning methods and principles.
- d) To develop the key concepts and principles of Urban and Regional Planning and teach students basic theories, methods and management of land use activities and the environment.
- e) To train students to acquire skills in research methods so that they can become capable researchers and who can execute problem-solving research, applied or pursue pure academic research.
- f) To develop in students entrepreneurial skills of value in self-employment.
- g) Inculcate in students the use of information technology on the effective management of environment, land use, etc.

3.11.3 Programme Duration:

The duration of the programme is five (5) years or ten (10) semesters for UTME candidates and four (4) years or eight (8) semesters for direct entry students leading to the award of a degree in Urban and Regional Planning. A maximum of 15 semesters are allowed.

3.11.4 Admission Requirements

UTME Admission

The entry requirements into 100 level require candidates to obtain at least five (5) credit passes in WAEC/SSSS/NECO OR GCE 'O' Levels. The subjects should include; English language, Mathematics and Geography, and any two from: Physics, chemistry,

Technical Drawing, Fine Arts, Economics, Biology and Surveying after obtaining acceptable pass in the Joint Matriculation Examination (JME).

Direct Entry Admission

Candidates with the following qualifications may be admitted into 200 level of the programme:

1. Holders of National diploma (ND) either in Town Planning, Land Surveying, Building, Architecture, Estate Management, Quantity Survey, with an upper credit.
2. Satisfied minimum Ordinary Level subjects as stated above;
3. Upper credit pass in any subject offered in the ND courses.
4. At least two (2) passes at the 'A' level, IJMB, HSC, with passes in Mathematics, Geography and any one of the following: Economics, Physics, Chemistry, Biology, Technical Drawing and Fine Arts.

In special cases holders of HND and its equivalent and those transferring from other Universities/Institutions may be admitted into 200 level of the programme.

3.11.5 Graduation Requirements

To qualify for the award of a degree in Urban and Regional Planning, a student must:

1. Pass all compulsory and required courses.
2. Complete, satisfactorily a minimum of 180 units.
3. Satisfy the requirements for studio practicals and SIWES.
4. Must have earned a minimum of 180 units including all compulsory and required courses

3.11.6 Instructional Modules

A. Urban and Regional Planning Theory

The different courses are distributed according to their importance as core courses and electives. It is expected that all programmes will ensure that students become conversant with the main aspects or key areas in urban and regional planning. The key areas (which form the body of knowledge to be acquired by the undergraduate) are as follows: Introduction to Environmental Design and Management, Basic Elements of Planning, Urban Development Planning, Rural Development Planning, Planning theory, History of Planning, Population and Urbanization, Advance Regional Planning, Urban and Regional economics, Transportation planning, Policy analysis, Land Use Studies, Housing Studies, Public Utilities and Services, Urban Renewal Techniques, Land Use and Management Theory, Industrial Development Planning, Recreation Planning, Land Economics.

B. Planning Techniques

Quantitative Techniques in Planning, Project Planning and Evaluation, Land Surveying, Environmental Impact Assessment, Principles of Valuation I, Application of computer to Planning I and II, Introduction to Measurements and Description

C. Planning Design

Site Selection and Planning, Building Design and Construction, Urban Design, Landscape Design, Planning Design, Planning Studios I-VII

- D. Professional Practice**
Professional Practice I and II, Management and Planning, Planning Land procedures, Development control and Settlement of disputes, Oral Examination
- E. Planning Research**
Research Techniques in Planning, Project Dissertation, Planning Seminars, Independent Projects
- F. Applied Science And Humanities**
General Studies, Principles of economics, Sociology for Planners, The Governing of Man, Introduction to Psychology, Statistical Sources and Methods I, Mathematical Methods I, Land Law, Law of Contract, Ecology and Natural Resources
- G. Special Topics**
Environmental Engineering; National Economic Development Planning; Political Economy of Nigeria; Applications of Operations Research in Planning; Metropolitan Planning; Computer Aided Design; Applications of GIS/LS in Planning; Technical Writing; Planning Model Making; Comprehensive Development Planning; Evolution of Planning thought; Community Development Planning; Technology, Human Settlement and Development

3.11.7 Resource Requirements for Teaching and Learning

See Section 1.6 and Section 4.

3.11.8 Courses for Urban and Regional Planning Degree Programme

Courses at 100 level Urban and Regional Planning

100-LEVEL URBAN AND REGIONAL PLANNING					
Course Code	Course Title	Units	Status	LH	PH
GST 111	Communication in English I	2	C	60	-
GST 113	Nigerian Peoples and Culture	2	R	30	-
GST 112	Logic, Philosophy and Human Existence	2	R	30	-
GST 121	Use of Library, Study skills and ICT	2	C	30	-
GST 122	Communication in English II	2	C	30	-
MTH 101	Elementary Mathematics I	3	C	45	-
MTH 102	Elementary Mathematics II	3	C	45	-
URP 101	Evolution of Planning	3	C	45	-
URP 102	Introduction to Land Use Planning I	2	C	30	-
URP 104	Introduction to Land Use Planning II	2	C	30	-
URP 111	Local Field Studies	3	C	-	135
GEO 106	Introduction to Environmental Science	3	R	45	-
GEO 102	Introduction to Human Geography	4	R	60	-
CMS 101	Introduction to Computer Science	2	E	15	45
GEO 105	Elementary Land Surveying	2	E	15	45
SOC 101	Introduction to Sociology	2	E	30	-

ECO 112	Theories and Principles of Economics	2	E	30	-
ARC 112	Planning the Built Environment	2	E	15	45
ARC 114	Introduction to Architecture	4	E	30	90
ARC 122	Freehand and Life Drawing	4	E	30	90
	Total	51			

All the Compulsory and Required courses are to be taken while any two or three courses may be selected from the list of Elective courses.

Courses at 200 level Urban and Regional Planning

200-LEVEL URBAN AND REGIONAL PLANNING					
Course Code	Course Title	Units	Status	LH	PH
GST 211	Environment and Sustainable Development	2	C	30	-
GST 222	Peace Studies and Conflict Resolution	2	R	30	-
GST 223	Introduction to Entrepreneurship	2	R	30	-
URP 201	Planning Principle and Practice	4	C	15	45
URP 202	Housing Studies I	2	C	15	45
URP 203	Planning Studio I	2	C		90
URP 206	History of Urban and Regional Planning	2	C	30	-
URP 207	Transportation Planning I	2	C	15	45
URP 211	Field Studies	3	C	-	13 5
STA 203	Statistics for Science and Engineering	3	R	45	-
CMS 201	Computer Programming	3	R	30	45
URP 208	Site Planning	2	E	15	45
URP 209	Environmental Planning and Management	3	E	30	45
URP 210	Urbanization	2	E	30	-
URP 214	Urban Land Economics I	2	E	30	-
URP 215	Social Aspects of Planning	2	E	30	-
URP 216	Globalization and Urban Development	3	E	45	-
URP 217	Regional Development Planning	2	E	30	-
URP 218	Pollution Control	2	E	30	-
GEO 204	Map Analysis	3	E	30	45
GEO 203	Human Spatial Organization	4	E	60	-
GEO 205	Elementary Surveying	3	E	30	45
GEO 206	Elementary Cartography	3	E	30	45
ECO 219	Urban and Regional Economics	2	E	30	-
SOC 212	Social Change	2	E	30	-
	Total	62			

All the Compulsory and Required courses are to be taken while any two or three courses may be selected from the list of Elective courses.

Courses at 300 level Urban and Regional Planning

300-LEVEL URBAN AND REGIONAL PLANNING					
Course Code	Course Title	Units	Status	LH	PH
URP 301	Urban Design I	2	C	15	45
URP 302	Housing Studies II	2	C	30	-
URP 303	Planning Studio II	2	C	-	90
URP 304	Planning Theory	4	C	45	45
URP 305	Regional Planning	2	C	30	-
URP 306	Planning Law and Administration I	2	C	30	-
URP 307	Transportation Planning II	3	C	30	45
URP 309	Quantitative Techniques and Methods in Planning	3	C	45	-
URP 311	Field Studies	3	C	-	135
URP 316	Principles of Geography Information System	2	C	15	45
URP 318	Project Planning and Evaluation	3	C	45	-
URP 308	Population Studies	3	R	45	-
URP 310	Urban Renewal	3	R	45	-
URP 313	Urban Land Economics II	3	E	45	-
URP 317	Urbanization in the Third World	2	E	30	-
SGI 319	Land Surveying	3	E	30	45
ARC 314	Principles of Landscape Design	3	E	30	45
URP 312	Metropolitan Planning	3	E	30	45
URP 314	Utility Planning	2	E	15	45
GEO 312	Cartography 1	2	E	15	45
URP 319	Elements of Land Law	2	E	30	-
URP 320	Principles of Valuation	2	E	30	-
GST 111	Communication in English I	2	C	60	-
		58			

All the Compulsory and Required courses are to be taken while any two or three courses may be selected from the list of Elective courses.

Courses at 400 level Urban and Regional Planning

400-LEVEL URBAN AND REGIONAL PLANNING					
Course Code	Course Title	Units	Status	LH	PH
URP 401	Urban Design II	2	C	15	45
URP 402	Housing Studies III	2	C	15	45
URP 403	Planning Studio III	3	C	-	135
URP 404	Planning Theory III	3	C	45	-
URP 405	Professional Planning and Practice I	2	C	30	-
URP 406	Planning and Administration II	3	C	45	-
URP 407	Transportation Planning III	2	C	15	45
URP 413	Research Methods I	3	C	45	-
URP 408	Development Control	2	R	30	-

URP 409	Planning Workshop	3	R	15	90
URP 411	Data Base Design and Creation in GIS	2	R	15	45
URP 414	Tourism/Recreational Planning	2	E	30	-
URP 415	Landscape Planning	2	E	15	45
URP 416	Planning Practice and Administration	2	E	30	-
URP 417	Law of Contract and Tort	3	E	45	-
URP 418	Management and Planning	2	E	30	-
URP 420	Remote Sensing	3	E	30	45
URP 421	SIWES	18	C	26 Weeks	
	Total	59			

All the Compulsory and Required courses are to be taken while any two or three courses may be selected from the list of recommended courses.

Courses at 500 level Urban and Regional Planning

500-LEVEL URBAN AND REGIONAL PLANNING					
Course Code	Course Title	Units	Status	LH	PH
URP 501	Project Planning and Implementation	3	C	45	-
URP 502	Housing Policy and Practice	2	C	30	45
URP 503	Planning Studio IV (Final)	3	C	15	90
URP 504	Advanced Planning Theory	2	C	30	-
URP 505	Professional Planning and Practice II	2	C	30	-
URP 506	Public Finance Management	2	C	30	
URP 507	Environmental Impact Assessment	3	C	30	45
URP 510	Planning Seminars	2	C	30	
URP 512	Project/Dissertation	6	C	-	270
URP 513	Research Method II	3	C	45	-
URP 508	Urban Management	2	R	30	-
URP 509	Application of Remote Sensing in Planning	2	R	15	45
URP 511	GIS Application in Planning	2	R	15	45
URP 515	Tourism Planning and Development(Tourism and Recreational Planning)	3	E	30	45
URP 516	Advanced Landscape Design	3	E	30	45
URP 517	Environmental Law	2	E	30	-
URP 518	National Development Planning	2	E	30	-
URP 519	Rural Settlement Planning	2	E	30	
URP 520	Politics of Development	2	E	30	-
URP 521	Climate Change	3	R	45	-
URP 522	Rural Water Supply and sanitation	2	E	30	-
	Total	53			

All the Compulsory and Required courses are to be taken while any two or three courses may be selected from the list of recommended courses.

3.11.9 Synopses of Courses in Urban and Regional Planning

URP 101: Evolution of Planning (2 Units: LH 45)

Historical development of Urban and Regional Planning theory and practice; the various planning models. Effect of philanthropic movements and public laws on Urban and regional Planning. The development and benefits of Urban and Regional Planning (URP) in Nigeria.

URP 102: Introduction to Land Use Planning I (2 Units: LH 15, PH 45)

Definitions and concepts of land and land use; The need for planning land use, Attributes of land use planning, methods of land use planning, principles of land use; land use determinants, land use dynamics and integrated spatial solutions for problems on different scales. Types and levels of planning in Nigeria

URP 104: Introduction to Land Use Planning II (2 Units: LH 15, PH 45)

Area-oriented integration of various tools for land use planning, regional and environmental management, Agricultural/rural land use planning: Models of land use planning; problems of land use planning in Nigeria.

URP 111: Local Field Studies (3 Units: PH 135)

Field studies for familiarization of students with the local environment and for practicalizing classroom lectures in human, physical Geography and urban planning.

CMS 101: Introduction to Computer Science (2 Units: LH 15, PH 45)

History of Computers, functional components of Computer, Characteristics of a computer, problem solving, flow charts Algorithms, computer programming statements, symbolic names, Arrays, subscripts, expressions and control statements. Introduction to Basic or Fortran Programming Language, Computer Applications.

SOC 101: Introduction to Sociology (2 Units: LH 30)

Social norms and behavior; social theory; Types of different societies; Sociology of Planning

ECO 112: Theories and Principles of Economics (2 Units: LH 30)

As introduction to the various issues, the nature of economics science, its scope and methodology; major areas of specialization, Historical development of economic ideas, major findings in the various areas of specialization, elementary principles of Micro-economic theories; current issues of interest and probable future development.

URP 201: Principle and Practice (4 Units: LH 45, PH 45)

Components of Urban and Regional Land use. Relationships between planning standard and city size, culture, transport, Building Technology. Standards for various land use including those of specialized areas, destitute centers and old people's homes, barracks, mixed land use, campuses, etc. Concepts, objective of planning, planning process, (zoning, types of zoning/mixed landuse, floating, conditional/contractual and phase zoning). Analysis and classification of urban landuses. Coding, slum and urban renewal; Techniques for identifying slums and degraded areas plus new town development. Principles and development

URP 202: Housing Studies I (2 Units: LH 15, PH 45)

Housing needs, demand and supply. Basic principles guiding housing standards; housing finance; investment by public, private and cooperative sectors, subsidies, loans and mortgage funds. Characteristics of Housing in Nigeria: design methods, construction materials, maintenance, forms and functions of elements. Housing policy: objectives and programmes. Appraisal of existing housing options in Nigeria. Case studies – planned public housing, planned private housing and traditional housing.

URP 203: Planning Studio I (2 Units: PH 90)

Students work in groups, and individual planning projects. The projects are to involve field works: study of planning problems on site, survey and analysis of land use of local setting. Technical report writing.

URP 206: History of Urban Regional Planning (2 Units: LH 30)

The course is to enable students know when, where and how human settlements emerged, and how social economic, political and technological factors and forces have influenced the way man has organized space and sought to control land use and his built environment over time and space.

URP 207: Transportation Planning 1 (2 Units: LH 15, PH 45)

The aims, models, roles and objectives of transportation planning. Relationship between transportation planning and land use planning. Methods of collection, analysis, interpretation and projection of traffic data, traffic problems and control problems, control measures and management problems of organization and regulation of public transport.

URP 208: Site Planning (2 Units: LH 15, PH 45)

Concepts, process, principles and factors of site selections, purpose of site selection: natural, cultural and factors plus criteria for selection. Grading and earthwork; gradient, method of earthwork calculations. Movement system and land uses: vehicular circulation system, street patterns, technical subdivision regulation: Concept, layout subdivision regulations, zoning regulations-residential, elements of landscaping; Basic consideration for landscaping, natural and man made elements, organization, plant selection trees, shrubs, hedges, grass, water plants etc

URP 209: Environmental Planning and Management (3 Units: LH 30, PH 45)

Concept of the environment; development and the environment; environmental problems; sustainable development and environmental planning objectives; intervention policies, techniques and world community awareness. Atmospheric and Regional Environment: Atmosphere pollution and green house effects, soil erosion, water pollution, deforestation and desertification; ecological, cultural and resource management concerns. Urban environment: aspects of housing, recreation and work environment, solid waste problems; automotive pollution. Environmental management projects. Sustainable fuel wood production, resource recovery, sustainable population and environmental Health, urban environmental planning principles and practices. Nigerian Policy and practice on the Environment; scope and functions of Ministry of Environment, and the role of Urban and Regional Planners in the ministry.

URP 210: Urbanization (2 Units: LH 30)

Urbanism as way of life. The process of change and population shifts between rural and urban area. Process of concentration and activities in a few urban centers. theories and techniques for studying urban growth. Urban-rural linkages. Urban planning, urban systems and national integration. Urbanization in relation to industrialization, modernization and development. Urbanization characteristics of Nigeria to the African continent and other Third world Countries. Urbanization policies in relation to general development objectives.

URP 211: Field Studies (3 Units: LH 135)

Field studies to be carried out in any state of Nigeria for students to identify and familiarize with urban and environmental planning, urbanization and urban growth, problems and potentials at various levels; etc, reports to be submitted.

URP 217: Regional Development Planning (2 Units: LH 30)

Concept of a region; Central place theory; Theories and processes of regional development; Regional Imbalance; Strategies for regional planning. Von Thunen Theory of concentric zones and economic base theory.

URP 218: Pollution Control (2 Units: LH 30)

Pollution and society; development and environment; the cost of pollution; version of pollution and pollution control; non-waste technology; the integrated approach action programme for the community, government, industry; the right to clean environment; United Nations Environmental Programme (UNEP).

CMS 201: Computer Programming (2 Units: LH 30)

Introduction to the computer and definitions, key functions of the computer, classification, components. Word processing using Microsoft words with an aim for report writing. Principles of Good Programming; Structured Programming concepts, Debugging and testing; string processing, Internal searching and sorting, Data Structures, Recursion. Use a programming Language difference form that in CS 201.

URP 216: Globalization and Urban Development (3 Units: LH 45)

World globalization (trends), impact of globalization on urban development; contemporary issues in globalization; indications of globalization; costs and benefits of globalization in Nigeria.

URP 214: Urban Land Economics I (2 Units: LH 30)

Land resources of Nigeria; Land as factor of production; population growth and land use; land and property markets; Legal controls on land Use; Land tenure system; Economic basis of urbanization; urban structure and land use pattern.

URP 215: Social Aspects of Planning (2 Units: LH 30)

Meaning and relationship of sociology to town planning. Concepts of ethnic groups and social structure. Social stratification and its theories. The effect of physical environment on sociology of a community urbanism and social problems, crime delinquency etc.

ECO 219: Urban and Regional Economics (2 Units: LH 30)

The application of micro-economic concepts to practical urban planning problems. Spatial price theory and application. Interaction of land, labour, capital management,

land capacity and efficiency; theory of rent, relation to value and spatial allocation of land uses to various competitive activities, real estate market. Economics of urban growth and special structure. The urban formal and informal economic sectors. Economics of urban development and basic cost estimation of projects.

SOC 212: Social change in Contemporary Africa (2 Units: LH 30)

An analysis of the nature and mechanisms of the transformation that African societies have undergone (and are undergoing) since the colonial encounter with the Western world. The colonial situation and African responses to it; the emergence of new economic, social, political institutions, status structures and ideological orientations, as well as the crisis of development in the post-colonial era will be explored. Theories of social change (e.g. functionalist, conflict, etc) are implicated throughout the discussion.

URP 301: Urban Design History I (2 Units: LH 15, PH 45)

Introduction to urban design and its relationship to urbanization. Elements of Urban design and their impact on the quality of environment. A general study of urban design of human settlements during the early times. Ancient, Medieval, Renaissance, Baroque, Evolution of industrial settlements and contemporary human settlements. The effects of new movements in civic design and town planning, Examples of traditional urban design characteristics of Nigerian cities

URP 302: Housing II (2 Units: LH 30)

Housing as a basic necessity, a major land use component and an integral component of urban and regional development. The universality of the housing problem. Classification of dwellings by building, materials, location, tenure and design variables. Assessing housing needs and demand in quantitative terms. Population structure, household, characteristics of housing, housing delivery systems.

URP 303: Planning Studio II (2 Units: PH 90)

Urban renewal and assessment of housing needs, housing problems and devising of appropriate solution. Goals, principles and methods of urban renewal. Social culture and socio- economic effects of urban renewal. costs and benefits of urban renewal schemes. Management of urban schemes. Case studies of urban renewal schemes.

URP 304: Planning Theory (4 Units: LH 45)

The purpose, philosophy and nature of planning. The scope and limit of urban and regional planning. Framework for planning and the political, social and economic variables. Ethics and social justice in planning and rising conflicts. Theories in/for planning and theories of planning. The nature of planning theory. Theory of planning and theory in planning. Normative descriptive, and prescriptive theories of planning. Evolution of town planning philosophy. The planning process, management and decision – making in planning process; the dynamic of political, social, cultural and economic variables. The planner's role and functions. Citizen's participation and evaluation in the planning process.

URP 305: Regional Planning (2 Units: LH 30)

Nature of regional planning and regional development. Formal, functional, administrative and planning regions, their unifying characteristic; the regional planning process; delineation techniques, analysis of regional change and growth, economic base theory, spatial and economic structure analysis of regions, goals formation surveys and

analysis, preparation of the regional plan, regional plan implementation, monitoring and evaluation.

URP 306: Planning Law and Administration I (2 Units: LH 30)

Purpose and legal basis of planning legislation. General introduction to the legal provision of legislation, contract, adjudication and to the concept of justice. A review of the evolution of laws relating to land and urban and regional planning in Nigeria and other countries. A critical review of some urban and regional planning laws and acts. Trends in planning legislation, land tenure and land policy: a review of the misuse of fundamental rights under the Nigerian. Constitution relating to land, land development. The land use acts, its provisions and limitations, building bye-laws and their application to regulate urban growth and direct development. Review and approval/process of land use plan. Planning law as a mechanism for solving urban problems of health, congestion and pollution.

URP 307: Transportation Planning II (3 Units: LH 30, PH 45)

Role of transportation in urban and regional planning: traffic generation as a function of land use: mode of transportation of goods, services, and people-characteristic and performances. Functional classification and hierarchy of urban and regional road networks. Introduction to road geometric and design of intersections. Surveys in traffic and transportation planning. Introduction to traffic control systems and management. Introduction to planning management and administration of mass transportation in cities. The accompanying workshop assignment will include basic surveys analysis, interpretation, synthesis and application of results in a variety of situations like road intersection, parking areas etc.

URP 308: Population Studies (3 Units: LH 30)

World population growth and distribution. Demographic and cultural characteristics. Types and causes of population movements, population composition and its analysis for the existing situation. Balanced population and prevalent trends. Estimation of current population characteristics and factors used in forecasting. Methods of population forecasting, trend projection, regression, ratio and apportionment, migration and natural increase growth composition analysis, matrix of framework and allocative forecasting methods.

URP 309: Quantitative Techniques and Methods in Planning (3 Units: LH45)

Estimate of current population characteristics and factors used in forecasting. Methods of population forecasting, trend projection, regression, ratio and apportionment, migration and natural increase growth composition analysis, metric of framework and allocative forecasting methods. Introduction to quantitative method, time series analysis, regression analysis, index numbers, linear programming and transportation network. Analysis of variance, scaling techniques, types of scales, social distance, social-metric measurement etc. Frequency distribution, comparison and complex tables. Statistical tests of hypothesis, mathematical models used in town planning simulation models, headship rate model, gravity model, rent model, demands models etc.

URP 310: Urban Renewal (3 Units: LH 45)

Urban renewal techniques, theories of urban renewal; Urban renewal as a technique for improving living conditions. Cost and benefits of urban renewal schemes; Economic

and social considerations for urban renewal. Management of urban renewal scheme; case studies of renewal schemes. Case studies of urban renewal schemes.

URP 311: Field Studies (3 Units: LH 135)

Case studies of planning projects, planning issues such as: urban sprawl, urban decay, regional planning strategy, urban renewal, new town/settlements etc

URP 312: Metropolitan Planning (3 Units: LH 45)

Planning peculiarities and definitions of metropolitan areas; Differences between other settlements in relationship to land use, population size and economy; planning needs of metropolitan areas; case studies of metropolitan area planning; special planning issues of metropolitan planning.

URP 313: Urban Land Economics II (3 Units: LH 45)

The application of micro-economy concepts to practical urban planning problems. Spatial price theory and application; Interaction of land, labour, capital, management, land capacity and efficiency; theory of rent, relation to value and spatial allocation land use to various competitive activities, real estate market. Economics of urban growth and spatial structure, the urban formal and informal economic sectors.

URP 314: Utility Planning (2 Units: LH 30)

Types and nature of urban utility system, utility and land use within the city. Estimates of the land, water supply: sources, quality and quantity, treatment, storage and distribution. Design and layout of drainage and sewerage, principles of storm water and sewage collection, treatment, disposal. Design of networks of utilities using wires – electricity, telegraph and telephone.

URP 316: Principles of GIS (2 Units: LH 15, PH 45)

Introduction to GIS basic principles; GIS components; Subsystems; the basic concepts of space (spatial modeling); components of a spatial database, spatial data model; Geoinformatics tools.

URP 317: Urbanization in Third World (2 Units: LH 30)

African cities in the context of the central place theory; city development in Pre-industrial Pre-colonial times; City development in post-colonial times; the nature and process of urbanization in Africa; Urbanization and the city system; Cities and African development.

URP 318: Project Planning and Evaluation (3 Units: LH 45)

The nature and processes of project planning; The need for project evaluation; Public vs private projects; Techniques and Methods of evaluating projects. Types of project; project initiation; feasibility studies; project planning and budgeting system; critical path analysis; sensitivity analysis – NPV, IRR. Project financing; sources of finance; project evaluation; cost – benefit analysis; cost-effectiveness analysis.

URP 319: Elements of Land Law (2 Units: LH 30)

Basic elements of land law; Land tenure, ownership; Rights in land, easement, right of occupancy; Legal controls over land ownership

URP 320: Principles of Valuation (2 Units: LH 30)

Functions of valuer; definition of value; types of landed property; demand and supply of and investment market; the property market; principles and methods of property valuation and Case studies

URP 401: Urban Design II (2 Units: LH 15, PH 45)

Scope and limits of Urban design form, scale, colour, harmony, texture, light, shade, dominance. Organization of space, solid and voids, symmetry and height. Space articulation –squares, streets.

UPR 402: Housing Studies III (2 Units: LH 15, PH 45)

Advanced Housing; Course will advance earlier knowledge in basic in housing and urban renewal techniques. Key concepts in housing provision, design, finance, construction and management will be studied in relation to typical housing area. Housing policy, mortgage institution; partnership in housing development and the role of informal organisations – Co-operative, NGOs, self-help etc. in housing development.

URP 403: Planning Studio III (3 Units: PH 135)

To introduce the concept of comprehensive urban planning (master plan). Methods of field survey, data analysis and projection modes. Emphasis will also be focused on the planning of central areas of the urban area. Theories of the city centre and its sphere of influence. Determination of functions and problems of city centre such as traffic, Land use, density control, etc.

URP 404: Planning Theory III (3 Units: LH 45)

The nature of planning, procedural and substantive theories in planning; statutory and advocacy planning; the planning process; modes, and traditions in both capitalist and socialist economics; public participation in planning; social science contribution to the development of planning theory; planning and the state; planning and the economy; the politics of planning. Synoptic comprehensive model, disjointed incrementalism, mixed scanning model, pluralism and advocacy. Radicalist planning thought.

URP 405: Professional Planning and Practice 1 (2 Units: LH 30)

Legal Planning: the ethics of preparing land use/master plans: Principles of writing planning briefs, pitfalls in planning, communication, technical reporting and graphic technique.

URP 406: Planning Law and Administration II (3 Units: LH 45)

Purpose and legal basis of planning legislation in Nigeria; General introduction to the legal process of legislation, contract, adjudication and the concept of justice; A review of the evolution of law relating to land and urban and regional planning in Nigeria; A critical review of some urban and regional planning laws an acts, Urban Renewal Act, Anti-Pollution Act, etc; Recent trends in planning legislation; Land tenure and land policy; A review of the misuse of fundamental rights under the Nigeria constitution relating to land, land development. The Land Use Act, its provisions, limitations and implications for planning, building by-laws and their applications to regulate urban growth and direct development; Legal aspect of review and approval process of land use plans. Planning laws as a mechanism for solving urban problems of health, congestion and pollution. Introduction to the elements and principles of administration, political structure and bureaucracy. The structure of federal, State and Local

Governments; Their planning scope and functions; Functions, power structures and resources of Administration of inter-regional and intra-regional planning. Management and decision making at various levels and within parastatals and line ministries; the administration of implementation of Urban Development plans; the legal provisions, the administrative structure and financing.

URP 407: Transportation Planning III (2 Units: LH 15, PH 45)

Traffic and Transportation II; Traffic engineering and design; Mass transit system. Advanced techniques for transportation planning; Preparation and implementation of transportation plan.

URP 408: Development Control (2 Units: LH 30)

The various strategies of development control; the mechanics of control; Laws, Codes, Regulations and standards; development plans/schemes and their implementation. Planning applications; consents; appeals; enforcement procedures of arbitration submission. Appointment of arbitration, rules of evidence. Preparation and publication for awards; Methods of enforcing and impeaching an award. Reference by order of the court statutory arbitration.

URP 409: Planning Workshop (2 Units: LH 15, PH 45)

This is a practical course on the design of urban sub-divisions and small towns; the art and oral block linear patterns, transportation linkages, zoning are discussed; site constraints, planning standard (density, noise, pacing and open space) housing types and organization (Plot size, broad acres, row housing and orientation) approval processes are considered.

URP 411: Data Base Design and Creation in GIS (2 Units: LH 15, PH 45)

Spatial database creation: Overview of database systems and its importance in a GIS, entities and relationships, database design and the conceptual database model, create attribute database on any of the database software's with preference to Microsoft access.

URP 413: Research Methods 1 (3 Units: LH 45)

Introduction to research methods in urban and Regional Planning: Selection of a research topic; definition of study problems and objectives; Formulation of research hypotheses; Experimental design for collection and analysis of data; writing a research proposal.

URP 414: Tourism/Recreational Planning (2 Units: LH 30)

Definition of recreation; Assessment of supply and demand for recreational resource; Recreation planning standard; Management of recreational resources; Nature of tourism development; Essentials of tourism planning; Tourism resources in Nigeria; consideration or design, construction and development of tourist resorts; Tourist organization; Travel agents and developers, impact of tourism; Tourism management.

URP 415: Landscape Planning (2 Units: LH 15, PH 45)

Concept in landscape planning and design; Basic elements of landscape; History of landscape planning; Landscape evaluation techniques; Topology of humanized landscape housing; Landscape construction, materials and methods; Landscape design techniques; Management of landscape.

URP 416: Planning Practice and Administration (2 Units: LH 30)

Qualification required to practice the profession; Code of conduct as prescribed by the Nigerian Institute of Town Planners (NITP) and Town Planning Registration Council (TOPREC); The town planning briefs; initiation of the projects, preparation and submission of preliminary outline for the proposed project. Selection of project team; Stages of approval by the appropriate authorities; Contract terms, condition and agreement; Scale of fees; Organization of planning office; Planning organization in Nigeria; Federal, state and Local Government Levels; Management and decision making in planning, Enforcement of planning controls and politics of planning in Nigeria.

URP 417: Law of Contract and Tort (3 Units: LH 45)

Introduction to Nigeria legal system; Formation of contract; Breach of contract and remedies; Nature of tort; Negligence; Public nuisance; The Rule in Ray lands and Fletcher

URP 418: Management and Planning (2 Units: LH 30)

Principles of management as applied to planning profession; Methods of financing plans; Methods of implementing and managing land use plans; Personnel management in planning.

URP 420: Remote Sensing (3 Units: LH 30, PH 45)

Elements of remote sensing system, techniques of remote sensing. Visual interpretation of imageries, digital image analysis, remote sensing application, interpretation of remote sensing and GIS in Planning research, case studies.

URP 421: SIWES (15 Units: 26 WEEKS)

Students are expected to spend six (6) months of the second semester of 400 level for practical work experience in any organization of their choice relevant to Urban Regional Planning profession. They are to participate in activities such as map making, planning practices, land survey, GIS and Remote sensing, Land, human and socio-economic surveys, basic field operations, equipments and facilities and any related assignments. They are to be supervised and a technical report is expected to be submitted for assessment after an oral defence has been completed by the students.

URP 501: Project Planning and Implementation 7 (3 Units: LH 45)

The course will include the process of project planning-phasing time scheduling, financing, budgeting and manpower assessment, techniques of project appraisal, project evaluation and project plan administration. Administration of inter-regional and regional planning. Management and decision-making at various levels and within practical. The administration and implementation of urban physical plans; the legal provision, the administrative structure and financing the implementation of the urban physical plan. Urban physical plan, information systems and techniques of reporting, evaluation and review of plans. Urban land policy and management.

URP 502: Housing Policy and Practice (3 Units: LH 30, PH 45)

Aims and objectives of housing policies and programmes. Housing as a sector of investment and integral part of national plan in Nigeria; Housing finance. Course will advance earlier knowledge in basic course in housing and urban renewal techniques. Key

concepts in housing provision, design, finance, construction and management will be studied in relation to typical housing areas.

URP 503: Planning Studio (Final) (3 Units: LH 15, PH 90)

Projects on city centre renewal and devising appropriate planning solutions. Methods and techniques of preparing local plans, briefs to be provided and Technical reports to be submitted after presentations to the external examiner

URP 504: Advanced Planning Theory (2 Units: LH 30)

Theory and philosophy of planning, systems, view of planning, different approaches to planning, public participation in planning, planning and professionalism, sustainable cities concepts and strategies, models in planning, social conflicts and social justice in the city and implications for planning and land use. New trends and concepts affecting planning theory gender issues., entrepreneurial and political issues, etc.

URP 505: Professional Planning and Practice II (2 Units: LH 30)

Town planning as a profession, planning process and the role of professional planners in the operation of the process. Relationship of planners with clients, contractors, developers, and institutions engaged in planning or other activities related to planning and implementation. Code of professional Conduct, conditions of engagement dispute and arbitration, conception, copy rights contract/ agreement documents. The NITP as compared with other professional bodies; Procedures for membership of NITP; Planning and politics; Planners and the elected representative; Planners and the general public

URP 506: Public Finance Management (2 Units: LH 30)

Development indices; national goals and economic decision making system in Nigeria. Fiscal system in Nigeria. Local taxation and property taxation systems and their relation effects on investment activities. State and local government fiscal relations: Financing and local services. Source and methods of obtaining public revenue, public budget making, public works, methods of cost benefit analysis in public decision making; public works, project financing, scheduling and management. Fiscal programming and long-term budgeting; financing of capital improvements. PPSB project evaluation. Comparative system of public finance. Impact of the private sector on shaping the urban environment, focusing on financial, political, legal and other forces. The function of governmental expenditure in the national economy, fiscal policies and sectoral outlays; spatial, implication of investment decisions.

URP 507: Environmental Impact Assessment (3 Units: LH 30, PH 45)

The idea of environment, impact, impact assessment. Historical evolution of Environmental Impact Assessment (EIA). Types of EIA. Techniques of EIA. Variations in EIA. Environmental Audit. Environmental impact studies and experiences in selected advanced countries; Nigeria's EIA Decree 1992 and its relevance to environmental protection.

URP 508: Urban Management (2 Units: LH 30)

Urbanism, urban growth, urban structures. Provision and financing of urban utilities; facilities and services; waste management, water, transportation, etc. A case study project.

URP 509: Application of Remote Sensing in Planning (2 Units: LH 30, PH 45)

Elements of remote sensing system, techniques of remote sensing. Visual interpretation of imageries, digital image analysis, remote sensing application, interpretation of remote sensing and GIS in Planning research, case studies.

URP 510: Planning Seminars (2 Units: LH 30, PH 45)

Seminars to be presented by each student covering specific problems, topics, phenomena in planning. This is to test the candidates ability to present his ideas in a seminar paper of high academic and professional standards.

URP 511: GIS Application in Planning (2 Units: LH 30, PH 45)

Application areas, basic questions that can be investigated using GIS. GIS project design, basic analysis in GIS, Cartographic Modeling and Land Information System.

URP 512: Project/Dissertation (6 Units: PH 270)

Every student is required to undertake a research study on any chosen topic as a special area of study in the planning profession to demonstrate their ability to carry out an independent work making contribution to knowledge with the guidance of an academic staff. Students are to choose their subjects in due consultation with their supervisors. The examination will be conducted with a viva, which will be attended by the external examiner.

URP 513: Research Method II (3 Units: LH 45)

Review of methodologies in Urban and Regional Planning, Types and sources of data requirements, development of research instrument, techniques in research methods and appropriate statistical analyses, presentation of research findings and conclusion, Referencing and appendixes.

URP 515: Tourism and Recreational planning (3 Units: LH 30, PH 45)

Definition of recreation; Assessments, supply and demand for recreational resources; Recreation planning standard; Management of recreation resources; Nature of tourism and development. Essentials of tourism Planning; Tourism resources of Nigeria. Consideration for design, construction and development tourist resorts; Tourism organization, travel agent and developers; Impact of tourism; Principles of tourism management.

URP 516: Advanced Landscape Design (2 Units: LH 30, PH 45)

This course is build-up on landscape design. It is in form of lectures and a major studio project. Practical work include detailed studies of landscape construction materials (both hard and software) and design exercises on major landscape projects such as housing, erosion, flooding, transportation, industry, public parks, forestry, beaches, land reclamation, landscape conservation techniques, landscape management techniques.

URP 517: Environmental Law (2 Units: LH 30)

Basic concept of environmental standard criteria and regulation. Federal environmental laws; organisation of environmental protection. States edict and regulations on the environment, plant and animal quarantine. Regulations and enforcement mechanisms, violations and sanctions. Comparative study of environmental laws in some advance countries. e.g. USA, Canada, Thailand, etc. International Laws and conventions.

URP 518: National Development Planning (2 Units: LH 30)

The meaning of national development planning, historical background of national development planning in Nigeria, its prospects and constraints.

URP 519: Rural settlement Planning (2 Units: LH 30)

The origin, growth and decline of Nigerian rural settlements as a reflection of changing social, economic, political and technological forces. Functions of rural settlements and their inter-relationships. Rural settlement patterns and structure in different culture zones in Nigeria. Case studies

URP 520: Politics of Development (2 Units: LH 30)

Definitions and concepts of development; types and aspects of development; politics in development; the role of politics in development; the need for politics in development; the politics of development in Nigeria-challenges and benefits

URP 521: Climate Change (3 Units: LH 45)

Climate change; environmental management implication of climate change with emphasis on Nigeria and West Africa; Global Strategies and the role(s) of institutions and organisations: WMO, UNEP, IPCC, manifestation of climate change. Vulnerability to climate change. Adaptation to climate change. Communicating climate change. Climate change versus environmental change.

URP 522: Rural Water Supply and Sanitation (2 Units: LH 30)

Water demand and supply globally. Population growth, Urbanization and water demand and supply in Nigeria. Strategies for rural and urban water supply. Design for urban water supply. Water treatment and sewage disposal systems (domestic, industrial and municipal). Urban sanitation systems. Public policies, plans and programmes on water and sanitation in Nigeria (the role of public, private, NGO's and CBO's). implementation of the MDG's on water and sanitation in Nigeria. Case studies on water and sanitation in specific neighbourhoods of Jos and other cities in Nigeria.

URP 523: Advanced Remote Sensing (3 Units: LH 30, PH 45)

Remote Sensing analytic digital image processing system. Fundamentals (Computers imaging systems, image representation- colour space, image sampling quantization, quality measurement, data products, storage and retrieval- Photowite systems, dip systems and software. Preprocessing (Encoding and decoding, sources of image degradation, atmospheric, radiometric and geometric errors, systematic and non-systematic correction, image geometry operations. Image Enhancement (Image characters, histogram, scatter plots, statistics and spatial statistics for processing, image models, spatial transforms, enhancements: radiometric and geometric operators, Fourier transforms, scale space transforms, image fusion, texture analysis. Image Classification (Spectral discrimination pattern matching Baye's theorem- signature and feature extraction- training and classification, supervised and unsupervised methods error matrix and accuracy estimates. Image Analysis (Concept of uncertainty, fuzzy partitioning, neural nets, sub-pixel classification concept, pattern recognition, feature descriptors). Remote sensing application, Integration of Remote Sensing and GIS in geographical research, case studies.

Please, forward your comment on any section of this document to the following email:
nucassessment@gmail.com
You can also call the following phone numbers: 08033145087, 08033201097
All comments should be received before 31st October, 2015

URP 524: Urban Sociology

(2 Units: LH 30)

Theories of urbanism, and impact of city life on social relationships and social institutions. The problems of urbanization and the implications for public policy. A treatment of the most important issues relating to the promotion of growth and the conservation of natural resources and environment, and the need to balance efficiency with justice in the allocation of resources in the public sector; representation, welfare, financial allocation, transportation, housing recreation, and environmental quality will be treated.

DRAFT

SECTION FOUR:

LABORATORY AND EQUIPMENT REQUIREMENT FOR ENVIRONMENTAL SCIENCE PROGRAMMES

4.1 Centralized Laboratory and Technical Facilities

Certain laboratories and Technical facilities are common to many of the programmes. It is therefore strongly recommended that such laboratories and facilities be established centrally in each faculty/college. The will include:

1. Computer Laboratory
2. Library/Resource Centre
3. Soil Science Laboratory
4. Materials Laboratory
5. Building Physics Laboratory
6. Reprographics Centre
7. Workshops

A. Computer Laboratory

The computer lab is a classroom designed to teach about and with computers. The primary considerations in its design size and location should be; ease of use, security and reliability. Appropriate hardware and software to meet the general student needs in the environmental sciences need to be provided.

i. List of equipment:

- a. Work stations at the minimum ratio of 1computer to every 4 full time equivalent students.
- b. Management Station: a set of control work stations to control access and usage of the work stations
- c. Server(s)
- d. Switch
- e. UPS systems/power backup
- f. Power voltage regulators/stabilizers
- g. Air conditioning
- h. Internet connectivity

B. Library/Resource Centre

The library/Resource Centre will normally be a quick reference library stocked with reference materials and current journal and periodicals relevant to the different programmes in each faculty. Internet access and electronic materials are strongly recommended for these specialized discipline libraries

C. Soil Science laboratory

The soil science laboratory will normally be equipped to carry out soil sampling and classification tests, soil analysis and soil moisture, permeability and bearing capacity tests. This range of tests will normally guide the range and type of equipment required. Listed below is a sample list of such equipment.

ii. List of equipment

- a. Soil sampling and classification
 - ✓ Hand Auger kits
 - ✓ Soil prospecting kit

- ✓ Soil samplers
- ✓ Soil sample bags
- ✓ Soil sieve sets
- ✓ Soil texture testing kits
- ✓ Tropical soil colour charts
- ✓ Soil penetrometers
- ✓ Hand operated compression machine
- ✓ Automatic compression machine with load paper
- ✓ Flexural/Tensile Testing Apparatus
- ✓ Compaction Factor Apparatus
- ✓ Atterberg limit apparatus
- ✓ Schmidt testing set
- ✓ Bituminous plastic flow tester
- ✓ Penetrometer
- ✓ Vicat apparatus
- ✓ Consistometer
- ✓ Oven - Heating and Drying
- ✓ Mortar Capping Apparatus
- ✓ Drying Shrinkage and Moisture movement Apparatus
- ✓ Aggregate Impact Value Apparatus
- ✓ Aggregate Compression Machine
- ✓ Curing Tanks
- ✓ Riffle Boxes
- ✓ Balances
- ✓ Slump test apparatus
- ✓ Void measurement apparatus
- ✓ Moulds of all types
- ✓ Set of Sieves
- ✓ Flow table
- ✓ Sieve Shaker
- ✓ Speedy Moisture tester
- ✓ Concrete Test Hammer
- ✓ Stone/Concrete Cutter

- b. Soil analysis
 - ✓ Different meters: PH, Nitrates, Potassium, Salt,
 - ✓ Sewage effluent test kit
- c. Permeability, moisture and compaction
 - ✓ Tensiometers
 - ✓ Infiltrometer
 - ✓ Soil moisture probes
 - ✓ Soil drying ovens
 - ✓ Soil compaction meters
 - ✓ Soil moisture sensor and meter
 - ✓ Soil temperature, moisture and salinity probes
 - ✓ Data loggers

D. Materials Testing Laboratory

The materials testing lab should be equipped to carry out experiments and tests on a wide range of materials including concrete, soils, asphalt, bitumen, and aggregates.

iii. **List of Equipment**

- a. Mechanical testing equipment
 - ✓ Universal testing machine
 - ✓ Impact testing machine
 - ✓ Vickers hardness testers
 - ✓ Notching machines
 - ✓ Hydraulic test pump
 - ✓ Extensometer
 - ✓ Digital thermometers
- b. Metallographic testing equipment
 - ✓ Shadowgraph checking machine
 - ✓ Metallurgical microscope with image analyser
- c. Chemical analysis
 - ✓ Carbon sulphur determinator
 - ✓ Atomic absorption spectrometer
 - ✓ Vacuum spectrometer
 - ✓ Weighing machines
 - ✓ Muffle furnace
 - ✓ Glass thermometer
 - ✓ Oven
 - ✓ Ammeter
 - ✓ Pressure gauges
 - ✓ Proving rings

E. **Building Physics Laboratory**

The building science lab enables multi scale experiments and studies ranging from urban scale to the micro environment. The range of equipment required include field studies equipment (usually hand-held) and controlled environment equipment.

- iv. Field studies Equipment
 - ✓ Infrared thermometers
 - ✓ Environmental data loggers
 - ✓ Heat flux sensors/meters
 - ✓ Flow meters
 - ✓ Tracer gas systems
 - ✓ Watt hour meters
 - ✓ Thermometers/digital, thermocouple
 - ✓ Anemometers
 - ✓ Humidity meters
 - ✓ Air quality meters
 - ✓ Sound meters
 - ✓ Portable weather stations
 - ✓ Heliodons
- v. Controlled environment Equipment
 - ✓ Sky simulator
 - ✓ Boundary layer wind tunnel
 - ✓ Controlled environment chamber

F. **Reprographics centre**

- ✓ Heavy duty photocopiers
- ✓ Heavy duty batch scanners
- ✓ DV cameras
- ✓ SLR cameras
- ✓ A3 colour printers
- ✓ A3 scanners
- ✓ Large format (A0) plotters
- ✓ Large format (A0) scanners

G. **Workshops**

The following workshop spaces are required. The workshops may also be used for displays of different materials building systems:

- (a) Carpentry and Joinery/furniture
- (b) Masonry and concrete work
- (c) Simple electrical wiring
- (d) Plumbing and Drainage
- (e) Model Making
- (f) Painting and Decorating
- (g) Mechanical shop and Welding

vi. **List of equipment**

Wood/Timber Workshop Equipment

- ✓ Woodworking machinery (all-purpose)
- ✓ Wood making hand tools
- ✓ Protective cover equipment
- ✓ Circular Saw
- ✓ Drilling Machine
- ✓ Lathe Machine
- ✓ Electric blower
- ✓ Portable bracing machine
- ✓ Dimension bench
- ✓ Finishers
- ✓ Portable cross cut saw

Building Services Workshop Equipment

- ✓ Welding Apparatus
- ✓ Electric Blower
- ✓ Hand Drill
- ✓ Electric heater
- ✓ Soldering kit/apparatus
- ✓ Acetylene regulator
- ✓ Spark lighter
- ✓ Lead pot
- ✓ Sanitary Appliances and fittings
- ✓ Water heater
- ✓ Pipe Cutter
- ✓ Portable Copper tube bending
- ✓ Bench pipe vice
- ✓ Cylinders
- ✓ Forging Machine
- ✓ Plumbing and drainage pipe and fittings (assorted)
- ✓ Sets of Tool Boxes

4.2 Specialized programme-based laboratory facilities

4.2.1 Architecture Programme

Physical Facilities

Spaces

Office accommodation for academic, academic/administrative support staff and students per capital should be based on the guidelines in the appendix. Indicated in table 3 below are the requirements for spaces peculiar to the architecture programme:

Minimum requirements for Architecture programme academic spaces

Space	Use	Minimum Area (m ²)
Studio Space/student	Students	3
Exhibition Space	Academic	0.5
Computer Lab	Academic	2 (50 users)
Storage Space/student	Students	0.2

In addition to the minimum space recommendations above, the following recommendation are made for other academic spaces for the effective operation of the Architecture programme.

a) **Classroom Space**

A minimum of two classroom spaces (capacity depends on enrolment) will be required for the undergraduate programme in Architecture. This provision is based on an assumption of six hours of contact per day for each year of study.

b) **Studio Space**

A suitably furnished and equipped studio space is recommended for each year of study.

c) **Seminar Space**

A seminar room/hall is a critical ancillary space and is recommended for each Architecture programme. A space such as this may serve the dual purpose as a studio project presentation room.

d) **Exhibition spaces**

Each architecture programme will be expected to have at least one fully furnished exhibition gallery for the regular display of architectural projects, building materials and other similar works of interest to the students and staff.

e) **Drawing and Reprographic Equipment**

Reprographic technology is developing so fast and the rate of obsolescence is so high that any attempt to be prescriptive is avoided. However, certain categories of equipment can be identified:

- i. T-square, Set-square, I-square and Drawing boards;
- ii. Various types of drawing instrument used by staff and students, which are usually owned by them;

- iii. Plan printing machines, Trimming machines and Light tables for reading drawings etc;
- iv. Still and video Cameras and essential equipment for photographic dark room equipment
- v. Slide projectors, Overhead projectors and Epidiascopes
- vi. Computers, Printers, Scanners, UPS, digitizers, Plotters, Multi-media Projectors.

f) **Computer Aided Building Design Laboratory**

This will include computers with fully licensed software for architectural design drawings, building energy analysis software as well as 3-D modelling software. Examples of current software include AUTODESK AutoCAD 2012, REVIT Architecture, TAS and all freeware proprietary software for renewable energy systems analysis and design.

4.2.2 Building Programme

Physical Facilities

Spaces

Office accommodation for academic, non-academic staff and students per capital should be based on the guidelines set out in section 4 of this BMAS:

a) **Classroom Space**

A minimum of two classroom spaces will be required for the undergraduate programme in building. This provision is based on an assumption of six hours of contact per day for each year of study.

b) **Studio Space**

A studio space is recommended for each year of study above the first year.

c) **Seminar Space**

A seminar room/hall is a critical ancillary space and is recommended for each Building programme.

d) **Laboratory Spaces**

The following laboratories with adequate capacity for enrolled students at any given time are required in a department of Building:

e) **Workshop Spaces**

The following workshop spaces are required. The workshops may also be used for displays of different materials building systems:

- i. Carpentry and Joinery/furniture
 - ii. Masonry and concrete work
 - iii. Simple electrical wiring
 - iv. Plumbing and Drainage
 - v. Model Making
 - vi. Painting and Decorating
 - vii. Mechanical shop and Welding
- a) Drawing office Equipment
 - ✓ T-Squares and drawing tables
 - ✓ Enlargement and Reducing Machine
 - ✓ Guillotine

- ✓ Photocopier
 - ✓ Duplicating machine
 - ✓ Slide projector
 - ✓ Scanner
 - ✓ Typewriters
- b) Construction Equipment
- ✓ Concrete Mixers (1 small and 1 large)
 - ✓ Dumper
 - ✓ Poker Vibrator
 - ✓ Crane
 - ✓ Rammer
- c) Surveying Equipment
- ✓ Theodolites
 - ✓ Quick set levels
 - ✓ Chains
 - ✓ Tapes
 - ✓ Ranging Rods
 - ✓ Distance measure tapes

4.2.3 Fine Arts and Industrial Design

Physical Facilities

a) **Spaces**

Studio Spaces: Studio spaces are recommended for each study option and for each level of study:

- | | |
|------------------------------|----------------------------------|
| (i) 1 Life Drawing studio | (ii) 1 Basic Design Studio |
| (iii) Sculpture studios | (iv) Print room |
| (v) Graphic Design studios | (vi) Press Room |
| (vii) Photography Studios | (viii) Dark Room for Photography |
| (ix) Painting studios | (x) Glass Design Studio |
| (xi) Metal Work Studio | (xii) Musicology Studio |
| (xiii) Research Laboratories | |

Equipment and Studio Requirement

- ✓ Metal foundry
- ✓ Furnace
- ✓ Grinding Machine
- ✓ Centers

Painting

- ✓ Painting easels
- ✓ Drawing donkeys
- ✓ Grinders

Glass Design and Technology

- ✓ Glass Blower
- ✓ Working tables and stools
- ✓ Welding machine
- ✓ other essential equipment

Metal Work

- ✓ Anvils
- ✓ Vices
- ✓ Assorted clamps
- ✓ Hammers
- ✓ Welding machine
- ✓ other essential equipment

Photography

- ✓ Cameras
- ✓ A full equipped dark room
- ✓ Dryer
- ✓ Hammers
- ✓ Other essential equipment

Musicology

- ✓ Fumigants
- ✓ Fume Cupboards
- ✓ Shelves
- ✓ Glazing Equipment

4.2.4 Geography

Meteorological Station

GIS laboratory

- ✓ full complement of computer hardware and current fully licensed professional grade software

Cartography Lab

- ✓ Large format (A0) scanners
- ✓ Large format (A0) printers
- ✓ Drawing tables and stools
- ✓ Overhead projectors
- ✓ Light boards
- ✓ Large format digitizers

Map room/Library

- ✓ GPS units
- ✓ Compasses
- ✓ Video recorders
- ✓ Video players
- ✓ Audi tape recorders and players

4.2.5 Industrial Design Physical Facilities

Studio Space

Each industrial design programme will endeavour to have the following studio space:
The required studio spaces include Life Drawing Studio, Ceramics Studios, Fashion Design Studio and Graphics Design Studios. Others are Print room, Photography studio, Press room and Dark room for Photography as well as Glass Design and Metal Work Studios respectively

Ceramics

- ✓ Throwing wheels (manual and electric)
- ✓ Firing Kilns (Large, Medium, Small)
- ✓ Fuga Mill
- ✓ Plunger
- ✓ Weighing Scale
- ✓ Modelling Stands
- ✓ Working Table
- ✓ Shelves

Graphic Design

- ✓ Studio Tables and Stools
- ✓ Letter Press Printing Machine
- ✓ Etching/Lithography/Offset Press
- ✓ Desktop computer for graphic work
- ✓ Enlarging Machine
- ✓ Box of types
- ✓ Guillotine
- ✓ Type-setter benches
- ✓ Silk-screen printing equipment
- ✓ Photocopier
- ✓ Reprographic equipment

Fashion Design

- ✓ Design Tables
- ✓ Stools
- ✓ Sewing Machines and Accessories
- ✓ other essential equipments

Textile Design

- ✓ Looms and Accessories
- ✓ Large Printing Tables
- ✓ Cupboards
- ✓ Design Tables and Stools

Glass Design and Technology

- ✓ Glass blower
- ✓ Working tables and Stools
- ✓ Furnaces
- ✓ Other essentials equipment

Metal Work

- ✓ Metal Work Table with 2 Racks
- ✓ Anvils
- ✓ Vices
- ✓ Assorted Clamps
- ✓ Hammers
- ✓ Welding Soldering and Bracing Machine
- ✓ Other essential equipment

Photography

- ✓ Cameras
- ✓ A well equipped dark room
- ✓ Dryer
- ✓ Glazing Equipment
- ✓ Other essential equipment

4.2.6 Surveying and Geoinformatics

The following Laboratories are required in a surveying and Geoinformatics Department:

Physical Facilities

See Section 1.6.2

In addition to the general provisions in Section 1.6.2, at least three (3) classrooms will be required for the undergraduate programme in Surveying and Geoinformatics.

One Seminar space for the Department or Faculty is considered adequate and could also accommodate other departments in the faculty.

The following Laboratories are required in a surveying and Geoinformatics Department:

- 1) Photogrammetry Laboratory,
- 2) Cartographic/Drawing office (for students and staff),
- 3) Geoinformatics/computer laboratory,
- 4) Geodesy and Hydrographic surveying laboratory,
- 5) Remote sensing laboratory and
- 6) Equipment store-room.