DENNIS OSADEBAY UNIVERSITY

ASABA, NIGERIA

FACULTY OF ENVIRONMENTAL SCIENCES

DEPARTMENT OF SURVEYING AND GEOINFORMATICS

HANDBOOK

FOR

BACHELOR OF SCIENCE (B.Sc.)

IN

SURVEYING AND GEOINFORMATICS

2023 – 2027

PREFACE

The University environment is diverse and dynamic, requiring students to be familiar with the rules and procedures of both the University and their Department. This handbook provides essential information on the Department of Surveying and Geoinformatics, including programme structure, courses offered, grading system, graduation requirements, staff details, and other guidelines to support students throughout their academic journey.

The B.Sc. Surveying and Geoinformatics programme was established and accredited in 2021 as one of the founding programmes of the Faculty of Environmental Sciences. It aims to foster excellence, critical thinking, and professionalism in teaching, research, and service. The programme equips students with the Surveying and Geoinformatics knowledge and skills needed to qualify to become surveyors and excel in the surveying profession, engineering industry, and further studies.

Students are encouraged to keep this handbook as a guide, especially during their first year.

I welcome you to the Department of Surveying and Geoinformatics and wish you a successful and rewarding studentship.

Eteje Sylvester O., Ph.D.
Lecturer-in-Charge
January, 2023

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SECTION 1.0

PREAMBLES

The overall challenges in our educational system and the underlying moral values have become a major concern to the nation. This situation has created a moral obligation on the part of the Government, which underpins the establishment of Dennis Osadebay University, Anwai, Asaba, to leverage education as a tool for social transformation.

Dennis Osadebay University (DOU), Asaba is one of the three new universities established by the Delta State government and approved by the National Universities Commission (NUC) in 2021. The university was established during the second tenure of the then Delta State Governor, Senator (Dr.) Arthur Ifeanyi Okowa and located at the former campus of Delta State University, Anwai, Asaba, the Delta State capital. Dennis Osadebay University started the 2021-2022 academic session with six faculties: Agriculture, Science, Arts, Environmental Sciences, Management and Social Sciences, and Computing, and with forty-six programmes.

SECTION 2.0

UNIVERSITY ORGANISATION AND ADMINISTRATION

The administrative structure of Dennis Osadebay University is patterned towards the existing Universities in Nigeria in the following order;

a. Visitor

The visitor to the Dennis Osadebay University, Asaba is the Executive Governor of the State. The visitor ensures adequate financial base and support for the optimized performance and management of the University.

b. Chancellor

The Chancellor of the Dennis Osadebay University, Asaba is appointed by the Visitor and is the highest Principal Officer of the University. The Chancellor, in relation to the University, take precedence before all other members of the University held for conferring degrees, diplomas and certificates, and other awards. The Chancellor is often a distinguished person in the society who is also visibly committed to the ideals of the University.

c. Pro-Chancellor

The Pro-Chancellor is appointed by the Visitor of the Dennis Osadebay University. The Pro-Chancellor take precedence before all members of the University except the Chancellor and except the Vice Chancellor when acting as chairman of Convocation.

d. Governing Council

The Council is the governing body empowered with the management of the affairs of the University and in particular, the control of the property and expenditure of the University.

e. The Vice-Chancellor

The Vice-Chancellor is the Chief Executive Officer and Academic Head of the University, and Chairman of Senate and Congregation.

f. Senate

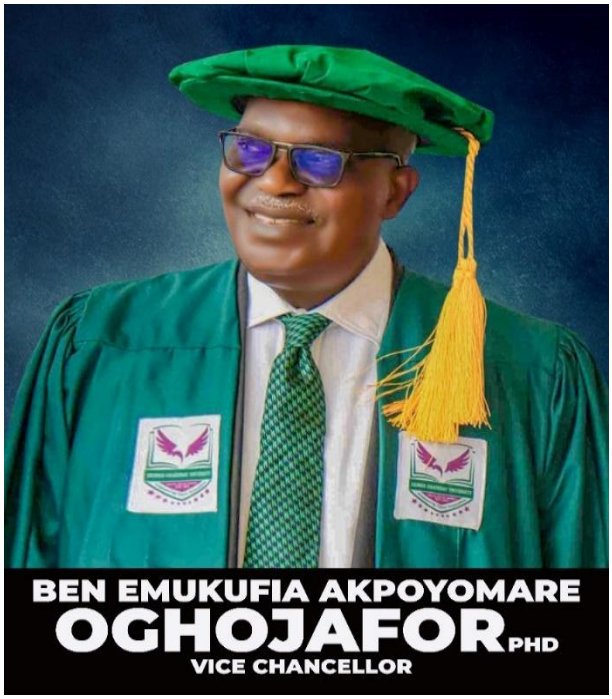
The Senate formulates academic policies including the organization and control of all academic activities of the University. It is the function of the Senate to organize and control teaching,

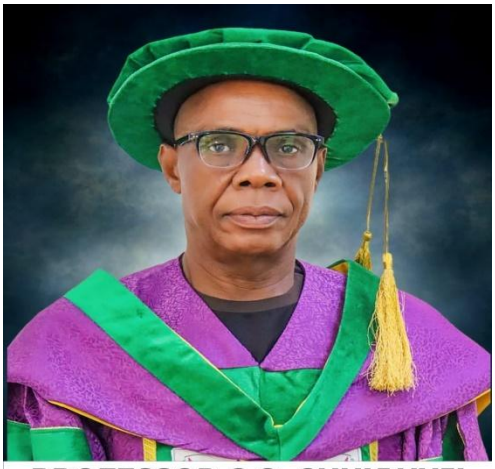
students' admission, and discipline of students and to promote research within the University. The member of the University Senate is comprising of:

i. Vice Chancellor	Chairman
ii. Deputy Vice-Chancellors	Member
iii. Deans of Faculties	Member
iv. Directors	Member
v. Heads of Academic Departments (HoDs)	Member
vi. Professors	Member
vii. University Librarian	Member
viii. Six Representatives of Congregation	Member
ix. Registrar	Secretary

SECTION 3.0

PRINCIPAL OFFICERS OF THE UNIVERSITY

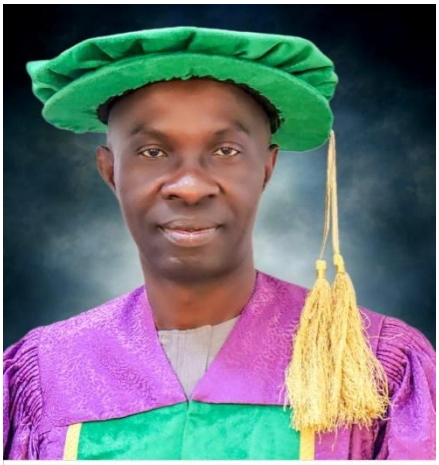




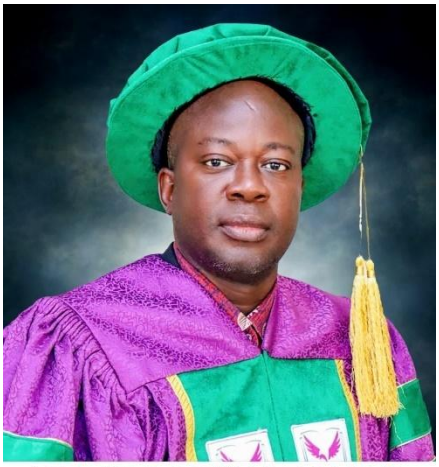
PROFESSOR C.O. CHUKWUJI
(DEPUTY VICE CHANCELLOR, ADMINISTRATION)

PROFESSOR R.O DODE
(DEPUTY VICE CHANCELLOR OF ACADEMICS)

MRS. GENEVIEVE .I. OBADAN
(REGISTRAR)



MR. OKOLO EMMANUEL OKOLO
(BURSAR)



DR. NELSON EDEWOR
(UNIVERSITY LIBRARIAN)

The day-day administration of the university is managed by the principal officers:

Vice-Chancellor
Professor Ben Emukofia Akpoyomare OGHOJAFOR
B.Sc. (UNILAG)
M.Sc. (UNILAG)
Ph.D. (UNILAG)

Deputy Vice Chancellor, Administration
Prof. Christopher Okeleke CHUKWUJI
B. Agriculture (UNN)
M.Sc (UNN)
PhD. (DELSU)

Deputy Vice Chancellor, Academics
Prof. Robert Oghenedoro DODE
B.Sc. (UNIUYO)
M.Sc. (UNIUYO)
PhD. (UNIPORT)

Registrar
Mrs. Genevieve Isioma OBADAN
B.Sc. (UNIBEN)
PGD (UNIBEN)
M.Sc. (UNIBEN)

Bursar
Mr. Okolo Emmanuel OKOLO (FCA)
B.Sc. (UNN)
MBA. (DELSU

University Librarian
Dr. Nelson EDEWOR
B.Sc. (DELSU)
M.Sc. (DELSU)
PhD. (UNN)

Location of the University
Dennis Osadebay University, Asaba, Delta State, Nigeria

SECTION 4.0

VISION AND MISSION OF THE UNIVERSITY

a. **Vision:** To be a leading transformational University for the empowerment of stakeholders by leveraging technology.

b. **Mission:** To provide a tradition of excellence in teaching, research, innovation, entrepreneurial skills, and competence endeavours towards meeting societal needs.

SECTION 5.0

FACULTY OF ENVIRONMENTAL SCIENCES

The Faculty of Environmental Sciences (FES) at the Dennis Osadebay University in Asaba, Nigeria, is one of the university's pioneering and prominent faculties. The FES, established at the inception of the university, has played a significant role in advancing science, research, and innovation in the region.

At the inception, FES consists of six different departments, each dedicated to a specific scientific discipline, fostering a comprehensive and diverse environment for scientific exploration and learning. These departments include: Architecture**,** Building, Fine and Applied Arts, Surveying and Geoinformatics, and Urban and Regional Planning. Today, the faculty has a total of ten programmes with the inclusion of Estate Management, Environmental Management, Geography, Industrial Design and Quantity Surveying. It serves as a hub for scientific exploration, innovation, and collaboration, making significant contributions to the academic and scientific landscape in Asaba, Nigeria, and beyond.

History of the Programme

On February 25th, 2021, the University was founded. Later that year, the NUC representatives and team visited and approved the BSc programme for the Department of Surveying and Geoinformatics in the Faculty of Environmental Sciences. The Department's program aims to equip students with broad practical and theoretical knowledge in the field of Surveying and Geoinformatics.

The programme' duration is five years and may vary depending on the mode of entry. In the first year, students learn general studies, basic sciences, and introductory courses in Surveying and Geoinformatics. During the second and third years, students take various courses related to Surveying and Geoinformatics. The fourth year is focused on practical experience in the same field. Students also receive specialized training in Surveying and Geoinformatics during this year. Additionally, students must complete a project on a specific Surveying and Geoinformatics issue under the guidance of a supervisor.

Vision Statement

The Surveying and Geoinformatics programme has a vision to crave excellence, precision and professionalism in teaching, research and service in all disciplines of Surveying and Geoinformatics which finishes in the development and growth of learners.

Mission

Our mission is to create and provide adequate training that can encourage the right interest in students who want to acquire the Surveying and Geoinformatics knowledge and skills needed to gain ascension to the highest level in Surveying and Geoinformatics discipline.

B.Sc Surveying and Geoinformatics Degree

Philosophy

The philosophy of the Department of Surveying and Geoinformatics, Dennis Osadebay University, Asaba is to expose students to the essential theoretical and practical training needed to make them grow into full and well-qualified professional who is abreast with technological advancements in the field of Surveying and Geoinformatics and to inculcate in the students, entrepreneurial and managerial skills geared towards self-employment.

Objectives

The objectives are to:

(1) ensure adequate knowledge of mathematics, physics, computer science, environmental management and protection, law, finance and management studies needed by surveying and geo-informatics experts;
(2) provide students with a broad and balanced foundation in theoretical and practical skills in surveying and geo-informatics;
(3) develop in students, the ability to apply theoretical and practical knowledge of surveying and geo informatics in solving environmental problems; and
(4) provide students with knowledge and skills from which they can proceed to further studies in the specialized areas of surveying and geo-informatics.

Geographic Information System (GIS) Laboratory

The Geographic Information System (GIS) laboratory is equipped with computer systems and printers for Staff and Students. The GIS software installed on the computer systems include: ArcGIS, Elder, ArcView etc.

Surveying Store

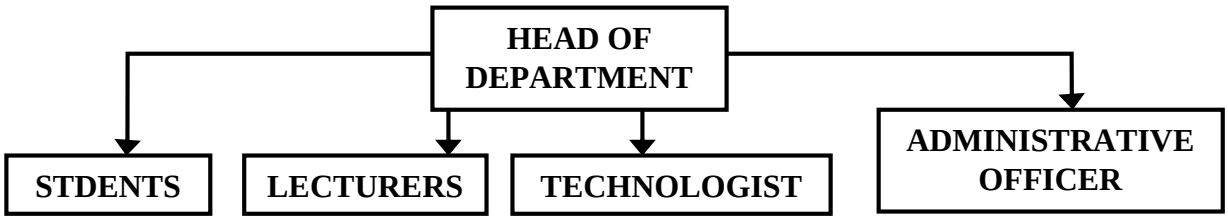
The Surveying Store is equipped with the following instruments:

S/N	ITEM	QUANTITY
1	Theodolite	2
2	Electronic Theodolite	4
3	Level	5
4	Compass	3
5	Single Frequency GPS Receiver (RTK) and Accessories	2 set (4 units)
6	Dual Frequency GPS Receiver and Accessories	7 units
7	Handheld GPS Receiver	10
8	Total Stations and Accessories	5
9	Tripod	10
10	Walkie Talkies	2
11	Ranging Pole	15
12	100 Metre Steel Tape	3
13	A0 Plotters and Accessories	1
14	A0 Scanners and Accessories	1
15	Echo sounder and Accessories	1
16	C-NAV 1 010 GNSS and accessories	2
17	C-NAV Display	1
18	GyroTrac	2
19	Tritech SSS and Accessories	1
20	Tritech SBP and Accessories	1
21	Easytrak USBL	1
22	EDM (Electronic Distance Measurement) devices	1
23	Digitizing Table	2

Course Adviser

The Head of Department appoints for each level a Course Adviser, who is a member of Academic Staff. The course adviser approves students' registration forms, advises students individually and ensures right choice in line with the regulations and requirements for the award of degree.

Departmental Organizational Structure/Board of Studies



The Department have both academic and non-academic staff with the Head of Department at the apex of the department's organizational chart. The organizational structure allows members of staff to interact freely with the Head of Department. Besides departmental management meetings, Committees are set up to handle some matters arising in the department.

Departmental Committees

The department has several Committees that oversee different arms, each committee with a Coordinator and some staff serving as members. The following is the list of the departmental committees whose members are roles/objectives are likewise presented: Administrative; Level Advisers; Curriculum Committee; Academic Standards & Quality Assurance Committee; Examinations/Time table Committee; Staff Welfare Committee; Accreditation; and Laboratory and Instrumentation Committee.

SN	Departmental Committee
A.	Level Advisers
B.	Curriculum Committee
C.	Academic Standards & Quality Assurance Committee
D.	Examinations/Time Table Committee
E.	Staff Welfare Committee
F.	Accreditation Committee
G.	Laboratory and Instrumentation Committee
H.	Library Committee

The Objectives/Roles of the Surveying and Geoinformatics Departmental Committee

A. Level Advisers Committee (Objectives/Roles)

1. To guide students on selection of course for registration and document them or students' signature.
2. To properly register students.
3. To collect for the department copies of registration form for the files.
4. To have good information on each student under them.
5. To have proper documentation on any of the assigned students going out of the university on any academic field trip, by counter signing and making recommendation for approval or otherwise on any application by the students.
6. To prepare monthly information on students' registration from the beginning to the end of each semester, this should be submitted to the coordinator.
7. Two copies of all communications on students must be collected by the special level advisers, one for the Department and the other for the adviser.
8. To open a black or red file on students who are to be watched or monitored especially for alignment with department/University requirements.
9. To have more direct relationship with the students than the coordinator.
10. To link up with the level representative/deputy in order to obtain information about each student when required.

B Curriculum Committee (Objectives/Roles)

The objectives of the Curriculum Committee are:

1. To develop, review, and update academic programs and curricula to ensure they remain current, relevant, and aligned with the university's mission and educational goals.
2. To maintain and enhance the quality of education by setting standards, benchmarks, and best practices for curriculum design.
3. To focus on promoting innovation in teaching and learning. It explores emerging trends in education and recommends the integration of new teaching methods, technologies, and interdisciplinary approaches into the curriculum.
4. To serve as a liaison between different departments and faculties within the university, and ensure that programs are coordinated to avoid redundancy and to encourage cross-disciplinary collaboration.
5. To ensure that the curriculum meets accreditation standards and guidelines, which is crucial for the university's reputation and the recognition of degrees awarded.

C Academic Standards & Quality Assurance Committee (Objectives/Roles)

The objectives of the Academic Standards & Quality Assurance Committee are:

1. To assess the quality, relevance, and alignment of academic programs and curricula with the university's mission and goals. It reviews and recommends changes to ensure that programs meet established standards and benchmarks.
2. To ensure that the university maintains compliance with accreditation standards and requirements.
3. To develop and implement quality assurance processes to monitor and evaluate the effectiveness of teaching and learning.
4. To formulate and update academic policies and procedures to uphold and improve academic standards.
5. To promote a culture of continuous improvement within the institution.
6. To facilitate processes for gathering student feedback on their academic experiences and incorporating this feedback into quality improvement initiatives.

D Examinations/Timetable Committee (Objectives/Roles)

The responsibilities of the exam office committee are as follows:

1. Collation of examination questions and marking guides from course lecturers.
2. Printing and keeping custody of examination materials before and after examination.
3. Preparation of examination invigilation schedule and monitoring the compliance level of invigilators and time-table preparation.
4. Liaising with the HOD to ensure that final year questions are sent out on time to approved external examiners for vetting, and correction where necessary.
5. Liaising with college examination office to ensure smooth conduct of examinations in the department.
6. Ensuring that only legible students are allowed to write examinations in the department.
7. Collection of result spreadsheet and making required number of copies for the College Board meetings.
8. Participation in College Board meetings for approval of results at the end of the semesters.
9. Liaising with the CSIS to effect necessary corrections on student’s result as the occasion demands.
10. To maintain constant touch with lecturers in other departments to teach our students to ensure that our students results are made available to the department as at when due.
11. Liaising with the CSIS to ensure that any students who have met the graduation requirement of the department is cleared and subsequently graduated.

E. Departmental Staff Welfare Committee (Objectives/Roles)

The objectives of the Departmental Staff Welfare Committee are:

1. To assess the unique (social) needs and concerns of staff within the department.
2. To promote the overall well-being of departmental staff by addressing their needs and concerns.
3. To facilitate opportunities for staff within the department to enhance their skills and knowledge through training, workshops, and other professional development activities that are specific to their roles and responsibilities.
4. To foster open and transparent communication within the department.
5. To develop and implement programs to recognize and reward the contributions and achievements of departmental staff.

F. Departmental Accreditation Committee (Objectives/Roles)

The objectives of the Departmental Accreditation Committee are:

1. To ensure that the department adheres to the specific accreditation standards and criteria established for the Surveying and Geoinformatics discipline/programme.
2. To continuously monitor and enhance the quality of the department's educational programs, faculty, research, and resources to meet or exceed the accreditation standards.
3. To maintain comprehensive records and documentation related to the department's compliance with accreditation standards.
4. To facilitate the self-assessment process within the department.
5. To develop and implement strategies and action plans to address areas in need of improvement as identified through the accreditation process.
6. To ensure that all communication and documentation are in line with accreditation requirements.
7. Oversee the preparation of self-study reports which evaluate the department's compliance with accreditation standards.
8. To stay informed about changes in accreditation standards and guidelines specific to the department's field of study. Make recommendations for policy or program adjustments to maintain compliance

G. The Laboratory and Instrumentation Committee

The committee is to:

1. ensure that all laboratory equipment and survey instruments are properly maintained and calibrated;
2. oversee and enforce safety standards and protocols within the laboratories;
3. assess the needs of the department/units and researchers within the university and make recommendations for the acquisition of new equipment or the upgrade of existing instruments to enhance research capabilities;
4. develop and manage the budget for laboratory and instrumentation needs. This includes allocating funds for equipment purchases, maintenance, and safety improvements; and
5. provide support to researchers and faculty members by facilitating access to advanced instrumentation and laboratory resources.

H. Library Committee (Objectives/Roles)

The objectives of the Departmental Library Committee are:

1. To assess the specific information and research needs of the department and recommend the acquisition of relevant library resources, including books, journals, databases, and digital materials.
2. To enhance library services tailored to the needs of the department.
3. To assist in managing the department's library budget.
4. To encourage staff and students within the department to utilize the library's resources effectively for research, teaching, and learning.
5. To advocate for the department's specific library requirements and communicate them to the university's library administration.

SECTION 6.0
Admission Requirements

UTME – Five Year Degree Programme. In addition to acceptable scores in UTME, candidates must have obtained five Senior Secondary Certificate (SSC) credit passes which must include Mathematics, Physics, English Language and any two of the following subjects: Geography; Technical drawing; Fine Arts; Chemistry; Biology; Economics; Agricultural Science and Elementary Surveying may be admitted into the programme.

The modes of entry into the programme include:

Direct Entry admission: Candidates who satisfy the UTME requirements and have G.C.E. (A/Level) passes in Mathematics, Physics and any one of the following subjects: Geography, Technical drawing, Fine Arts, Chemistry, Biology, Economics, Agricultural Science OR hold a National Diploma in Surveying and Geoinformatics or other related discipline with a minimum of upper credit from the recognised programme may be admitted into 200 level. Candidates who satisfy the ND requirements and in addition hold Higher National Diploma in Surveying Geoinformatics with a minimum of Upper credit from the recognised accredited programme and have successfully completed mandatory National Youth Corps Service (NYSC) scheme may be admitted into 300 level of the programme.

Graduation Requirements

UTME Students
For a candidate to graduate under a five-year B.Sc. (Honours) degree programme in Surveying and Geoinformatics, he or she MUST pass a minimum of 150 units including all compulsory courses for the programme.

Direct Entry Students
For candidates with the National Diploma (ND) and Higher National Diploma (HND) to graduate under a five-year B.Sc. (Honours) degree programme in Surveying and Geoinformatics, they MUST pass a minimum of 120 units and 90 units, respectively, including all compulsory courses for the programme.
Adequate units are given in each programme for the student's choice of elective courses within and outside the Faculty of Environmental Sciences.

Academic Advisers
Every student is attached to an Academic Adviser who is a member of the academic staff of the department and who will advise him/her on academic affairs as well as on personal matters where necessary. Academic Advisors are expected to follow their student's academic progress and provide counseling to them. It is the duty of the Head of the Department to assign an Academic Adviser to each student at the beginning of each academic session.

Minimum Duration
The minimum duration of the B.Sc. Surveying and Geoinformatics is five academic sessions (10 semesters) for candidates who entered through the UTME Mode. Direct entry candidates admitted into 200 level of the programme will spend a minimum of four academic sessions (8 semesters). While those admitted into 300 level will spend a minimum of three academic sessions (6 semesters). The maximum sessions allowed for the programme are seven academic sessions (14 semesters) for the 5-year degree programme through UTME. The maximum sessions allowed for the programme for students admitted through the direct entry mode, ND and HND are six and five academic sessions (12 semesters) and (10 semesters, respectively.

Continuous Assessment
During the semester, students are given take-home assignments, quizzes and tests in each course. These constitute continuous assessment. The continuous assessment scores are recorded and form part of the

final score in the given course. The CA forms 30% of the marks, while the exams are 70% making a total of 100%.

Semester Examinations
At the end of each semester, students are given an organized examination in each course. The score obtained in the examination together with the continuous assessment score form the course final score.

External examiners' system
The involvement of external examiners from other universities is a crucial quality assurance requirement for all courses in the Nigerian University system. In this regard, external examiner is appointed by the management as recommended by the department head and/or dean of the faculty. The external examiner moderates the final year examination question papers to the scope and depth of the respective course vis-à-vis the curricular expectation. The external examiner also examines the student's final project work orally. Here, the student is expected to defend his/her written/practical work before the external examiner.

Grading System

Examination grades are reported with the following designations:

Mark/Score (%)	Grade	Grade Point
70-100	A	5.00
60-69	B	4.00
50-59	C	3.00
45-49	D	2.00
40-44	E	1.00
0-39	F	0.00

Degree Classification

Classes and Ranges

Degree Class	CGPA Range
First class	4.50 - 5.00
Second class upper	3.50 - 4.49
Second class lower	2.40 - 3.49
Third class	1.50 - 2.39
Pass	1.00 - 1.49

Probation
A student whose cumulative Grade Point Average is below 1.00 at the end of a particular session, earns a period of probation for one academic session.

Withdrawal
A candidate whose cumulative Grade Point Average is below 1.00 at the end of a particular year of probation shall withdraw from the university. However, in order to minimize the waste of human resources, consideration shall be given to withdrawal from the programme and possible transfer to other programmes within the university as recommended.

HOW TO CALCULATE GRADE POINT AND GRADE POINT AVERAGE

A **Grade Point (GP)** is the product of the Course Credit Unit (CU) and the Point Score (PS) for each course. The formula is:

$$GP = CU \times PS$$

The sum of all Grade Points for a semester is called the **Total Grade Point (TGP)**, calculated as:

$$TGP = \sum GP$$

The **Grade Point Average (GPA)** is then calculated by dividing the TGP by the **Total Credit Units (TCU)**:

$$GPA = TGP / TCU$$

Example: A student registered for five courses and received the following marks in the Examination:

Table 3.2: Course Grades and Points Calculation

Course	Credit Unit (CU)	Score (%)	Grade	Point Score (PS)	Grade Point (GP)
DOU-MUO 111	6	62	B	4.0	24
DOU-MUO 112	3	48	D	2.0	6
DOU-MUO 113	3	54	C	3.0	9
DOU-MUO 114	6	72	A	5.0	30
DOU-GST 112	2	60	B	4.0	8
TOTAL	**20**				**77**

To calculate the GPA:

- **TGP** = (6 × 4) + (3 × 2) + (3 × 3) + (6 × 5) + (2 × 4) = **77**
- **TCU** = 6 + 3 + 3 + 6 + 2 = **20**
- **GPA** = TGP / TCU = 77 / 20 = **3.85**

The **GPA** scale ranges from **0** to **5**, with **5.0** being the highest possible GPA.

The **Cumulative Grade Point Average (CGPA)** is calculated by adding the TGP for all semesters and dividing it by the sum of the TCU for those semesters. Like the GPA, the CGPA also ranges from **0** to **5**. It is calculated for all courses taken from the first semester (Alpha Semester) of the first year (100 level) to the current semester.

The final degree classification is based on the cumulative GPA. A candidate must have an overall **GPA of 1.50** or higher to be awarded an Honours Degree.

SENATE REGULATIONS GOVERNING CONDUCT OF EXAMINATIONS

The following rules and regulations shall govern the conduct of examinations at Dennis Osadebay University. Any contravention of the under-listed rules and regulations shall constitute an examination misconduct:

(i) A registered student must earn 75% class attendance to be allowed to write the end of semester examination.

(ii) Attendance sheets for examination are generated from the list of registered students.

(iii) Any student who has not paid fees will not have his/her name on the list of registered students which will be published two weeks before the commencement of each semester's examination for the purpose of cross-checking.

(iv) Students not duly registered by their departments as having fulfilled the prescribed conditions for course registration will not be admitted into the examination hall.

(v) Students shall report at the stipulated examination halls 30 minutes before the start of examinations.

(vi) No student shall be allowed into the examination hall after 30 minutes of the start of the examination.

(vii) No student shall be allowed to withdraw from the examination within 30 minutes of the commencement of the examination.

(viii) Students may go to the toilet, etc., during examination provided that they are accompanied throughout the period of absence by an authorized University staff. Such absence must not be unreasonably prolonged and the student shall not be allowed any extra time by reason of such absence.
(ix) Students shall not be allowed to bring into the examination hall any answer sheet/booklet used or unused.
(x) Students shall not walk out of the examination hall with any answer sheet/ booklet used or unused.
(xi) Students shall comply with any instructions given by the invigilators as to the submission of their answer booklet after the examination.
(xii) Faculties and Departments shall provide security checks by ensuring that examination booklets are duly stamped and signed before the start of examinations.
(xiii) It shall be the responsibility of each student to ensure that his/her examination booklet is duly stamped and signed.
(xiv) Students shall not talk to one another, give or receive from one another any form of assistance such as pens, erasers, pencils, rulers, calculators etc.
(xv) All questions pertaining to the examination must be directed to the invigilators.
(xvi) Invigilators shall report any examination misconduct formally to the HOD or Dean of the appropriate Department or Faculty as specified by the Senate.
(xvii) Invigilators shall inform the students of the exact time to start an examination and thereafter inform them of the time left at reasonable intervals until the end of the examination.
(xviii) Examination question papers must contain marks allotted for the examination and marks allotted for each question.
(xix) Invigilators shall ensure that personal effects such as bags, textbooks, scrap notes, handsets, MP3 players, earphones, unauthorized calculators and logbooks, smart watches, organizers, hotspots gadgets and any other incriminating materials etc., are not brought into the examination hall by students.
(xx) Silence shall be maintained throughout the duration of examinations.
(xxi) Invigilators shall ensure that all students sign the attendance register
(xxii) No one is permitted to enter an examination hall earlier than 30 minutes before the start of an examination
(xxiii) Upon entry into the examination hall, students should sit at the desk that has been assigned to them.
(xxiv) Students will be required to process and present examination dockets from their departments before examinations. Evidence of Faculty, Department dues and School fee payments shall be verified during the week of revision.
(xxv) All rough work must be done in the answer booklets provided.
(xxvi) Students are not allowed to eat or drink during the examination
(xxvii) At the end of the examination, students must stop writing and remain seated until they hand in their answer booklets in an orderly manner
(xxviii) Any student caught committing an examination misconduct should be issued an examination misconduct form to fill out and be allowed to continue with the examination.

Penalties for Examination Misconduct

A student may be penalized based on the established case of examination misconduct or any action likely to cause a breach of peace during examinations. Such a student will however have the opportunity to defend him/herself before the Students' Examination Misconduct Committee. Once a student is expelled from the University on grounds of examination misconduct he/she has no opportunity of being re-admitted to the University.

Prescribed Penalties for various forms of Examination Misconducts

S/N	Examination Misconducts	Penalty
1.	Impersonation or Fake identity	Expulsion
2.	Smuggling and Possession of Answer Booklet	Expulsion
3.	Destruction of unauthorized materials when caught	Expulsion
4.	Attacking or threatening Invigilators	Expulsion
5.	Plagiarism of content	Expulsion
6.	Tendering unauthentic (fake) document	Expulsion
7.	Auto Coding Software and use of Team Viewer software to take control of students' computers remotely	Expulsion
8.	Hacking of the question bank/system, resulting in content leakage of questions	Expulsion
9.	Screen sharing/Mirroring to other devices/Projectors of friends/classmates/family/experts to cheat	Rustication: two (2) semesters
10.	Cheating with Technological Devices/ High-Tech Equipment e.g. micro Bluetooth powered devices buds, augmented reality glasses, invisible smart watches, hard drives, USA among other things	Rustication: two (2) semesters
11.	Use of Smart phones/Smart Devices and Mobile Education apps, to retrieve automated recommended answers	Rustication: two (2) semesters
12.	Deliberate obstruction of Proctoring Device	Rustication: two (2) semesters
13.	Presence of Family/Friends in the Examination Room	Rustication: two (2) semesters
14.	Indecent Dressing (Dressing that does not conform to the University Dress Code)/Nudity	Rustication: two (2) semesters
15.	Smoking, eating or drinking during the examination	Rustication: two (2) semesters, and Referral to the student Disciplinary Board for Drugs and Drug related offences
16.	Failure to submit answer scripts	Rustication: two (2) semesters
17.	Possession and copying from jottings of relevant materials on body parts/devices	Rustication: two (2) semesters
18.	Possession and Copying from unauthorized/written materials	Rustication: two (2) semesters
19.	Aiding and Abetting others to copy	Rustication: two (2) semesters
20.	Refusal to submit offending materials	Rustication: two (2) semesters
21.	Collaborative copying	Rustication: two (2) semesters
22.	Refusal to complete examination Misconduct Forms	Rustication: two (2) semesters
23.	Unauthorized communication	1st Timer: Warning 2nd Timer: Rustication: One (1) Semester
24.	Disruptive Behaviour in the examination hall	1st Timer: Warning 2nd Timer: Rustication: One (1) Semester
25.	Influencing Examination Official	1st Timer: Warning 2nd Timer: Rustication: One (1) Semester
26.	Unauthorized Changing of Sitting position	1st Timer: Warning 2nd Timer: Rustication: One (1) Semester
27.	Possession of mobile telephone(s) and other device in the examination hall, either in use or not	Rustication: two (2) semesters

28.	Taking examination in an environment that does not conform to the University guidelines for Virtual Examination (For example: Writing Examinations in public/private transport, noisy areas etc.....)	Rustication: two (2) semesters
29.	Disobeying Examination Instructions	1st Timer: Warning 2nd Timer: Rustication: One (1) Semester
30.	Recidivism	Expulsion (Except cases listed in 25-28 above)
31.	Failure to appear before the Misconduct Panel	Suspension for 2 semesters after which non-appearance leads to expulsion
32.	Other related acts of Examination Misconduct not specifically stated	Penalty shall be determined based on the recommendation of the Misconduct Panel.

SECTION 7.0 Courses for B.Sc. Surveying and Geoinformatics Programme

CCMAS-Course Structure and Contents

This subsection presents the CCMAS courses, outlining their structure and providing a synopsis of the Surveying and Geoinformatics programme.

CCMAS Course Structure

100 Level Courses (FIRST SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
GST 111	Communication in English	2	C	15	45
MTH 111	Elementary Mathematics 1	2	C	30	-
PHY 111	General Physics I	2	C	30	-
PHY 112	General Physics Practical I	1	C	-	45
COS 111	Introduction to Computing Sciences	3	C	30	45
BUD 111	Introduction to Building I	2	C	30	-
FAA 111	Basic Drawing I	2	C	-	90
DOU-SVG 111	Basic Draughtmanship I	2	C	15	15
	First Semester Total	**16**			

100 Level Courses (SECOND SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
GST 121	Nigerian Peoples and Culture	2	C	30	-
MTH 121	Elementary Mathematics II	2	C	30	-
PHY 121	General Physics II	2	C	30	-
PHY 122	General Physics Practical II	1	C	-	45
SVG 121	Introduction to Surveying and Geoinformatics	1	C	15	-
GEO 121	Introduction to Practical Geography	3	C	15	15
DOU-SVG 121	Basic Draughtmanship II	2	C	15	15
DOU-SVG 122	Technical Drawing	3	C	15	15
	Second Semester Total	**16**			
	Sessional Total	**32**			

200 Level Courses (FIRST SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
GST 211	Philosophy, Logic and Human Existence	2	C	30	-
ENT 211	Entrepreneurship and Innovation	2	C	15	45
SVG 211	Basic Surveying I	2	C	15	45
SVG 212	Photogrammetry I	2	C	15	45
SVG 213	Cadastral Surveying I	2	C	15	45
SVG 214	Computer Applications in Surveying	2	C	15	45
COS 211	Computer Programming I	3	C	30	45
DOU-SVG 211	Elementary Cartography	2	C	15	15
First Semester Total		**17**			

200 Level Courses (SECOND SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
SVG 221	Geodetic Astronomy	2	C	15	45
SVG 222	Field Astronomy	2	C	15	45
SVG 223	Cadastral Surveying II	2	C	15	45
SVG 224	Basic Surveying II	2	C	15	45
SVG 225	Surveying Computations	2	C	15	
SVG 226	Surveying Instrumentation	2	C	15	45
DOU-SVG 221	Electronic Surveying	3	C	15	
Semester Total		**15**			
Sessional Total		**32**			

300 Level Courses (FIRST SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
GST 311	Peace and Conflict Resolution	2	C	30	-
ENT 311	Venture Creation	2	C	30	-
SVG 311	Photogrammetry II	2	C	15	45
SVG 312	Remote Sensing I	2	C	15	45
SVG 313	Mining and Special Survey	2	C	15	45
SVG 314	Cadastral Surveying III	2	C	15	45
GEY 314	Principles of Geophysics	2	C	30	
DOU-SVG 311	Database Design and Application	2	C	15	15
First Semester Total		**16**			

300 Level Courses (SECOND SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
SVG 321	Geodetic Surveying	2	C	15	45
SVG 322	Adjustment Computation I	2	C	30	-
SVG 323	Geographic Information System	2	C	15	45
SVG 324	Engineering Surveying	2	C	15	45
SVG 325	Topographic Surveying	2	C	15	45
DOU-SVG 321	Survey Camping	3	C	-	45
DOU-SVG 322	Cartography and Map Creation	2	C	15	15
DOU-SVG 323	Potential Theory and Spherical Harmonics	2	C	15	15
Second Semester Total		**17**			
Sessional Total		**33**			

400 Level Courses (FIRST SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
SVG 411	Photogrammetry III	2	C	15	45
SVG 412	Adjustment computation II	2	C	30	-
SVG 413	Remote Sensing II	2	C	15	45
SVG 414	Map Projection	2	C	30	-
SVG 415	Hydro-Graphic Surveying I	2	C	15	45
DOU-SVG 411	GIS Tools and Applications	2	C	15	15
DOU-SVG 412	Practical for Surveying and Geoinformatics Students	3	C		30
DOU-SVG 413	Digital Mapping Methods	2	C	15	15
First Semester Total		**17**			

400 Level Courses (SECOND SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
SVG 499	Students Industrial Work Experience Scheme (SIWES)	15	C	-	270
Second Semester Total		**15**			
Sessional Total		**32**			

500 Level Courses (FIRST SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
SVG 511	Aerial Triangulation	2	C	15	45
SVG 512	Hydro-graphic Surveying II	2	C	15	45
SVG 513	Photogrammetry IV	2	C	15	45
SVG 514	Research Method	2	C	30	-
DOU-SVG 511	Project Management For Surveyors	2	C	30	-
DOU-SVG 512	Seminar	2	C	30	-
DOU-SVG 513	Coastal and Marine Studies	3	C	30	-
First Semester Total		**15**			

500 Level Courses (SECOND SEMESTER)

Course Code	Course Title	Units	Status	LH	PH
SVG 521	Geometric Geodesy	2	C	30	-
SVG 522	Satellite Geodesy	2	C	15	45
SVG 523	Physical Geodesy	2	C	30	-
SVG 599	Project Dissertation	4	C	-	180
DOU-SVG 521	GNSS Theory and Applications	3	C	15	15
DOU-SVG 522	Survey Laws, Regulations and Professional Practice	2	C	30	-
Second Semester Total		**15**			
Sessional Total		**30**			

CCMAS course synopsis

GST 111: Communication in English (2 Units C: LH 15; PH 45)

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter,

Curriculum Vitae, Report writing, Note making and Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening. Report writing.

MTH 111: Elementary Mathematic I (2 Units C: LH 30)
Elementary set theory, subsets, union, intersection, complements and Venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series. Theory of quadratic equations and binomial theorem. Complex numbers, algebra of complex numbers and the Argand diagram. De-Moivre's theorem and nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

PHY 111: General Physics I (2 Units C: LH 30)
Space and time. Units and dimension. Vectors and scalars. Differentiation of vectors. Displacement, velocity and acceleration. Kinematics, Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics, equations of motion, conservation principles in physics, conservative forces, conservation of linear momentum, kinetic energy and work. Potential energy, system of particles and centre of mass. Rotational motion; Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates, conservation of angular momentum and circular motion. Moments of inertia, gyroscopes and precession. Gravitation: Newton's law of gravitation, Kepler's Laws of planetary motion, gravitational potential energy, escape velocity, satellites motion and orbits.

PHY 112: General Practical Physics I (1 Unit C: PH 45)
Quantitative measurements. Treatment of measurement, errors and graphical analysis. Experimental techniques for studies of meters, oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity and others covered in PHY 101. Emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

COS 111: Introduction to Computing Science (2 Units C: LH 15, PH 15)
Brief history of computing. Description of the basic components of a computer/computing device. Input/output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and impact in the world today. The different areas/programs of the computing discipline. The job specializations for computing professionals. The future of computing. Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smart boards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.

BUD 111: Introduction to Building I (2 Units Core: LH 30)
Overview of the building construction process and the building industry. The role of different stakeholders in the construction industry. Building as a structure, a process and a discipline. The history of building, its function and types; origin and growth of settlements, factors affecting settlements and its development, statutory and local authority requirement. Introduction to building profession and other related professions in the built environment such as Land Surveying and Geo-informatics, Urban and Regional Planning, Architecture, Quantity surveying, Estate Management, Civil, Mechanical and Electrical Engineering. Scope of duties, future prospects and roles of professionals in the construction industry.

FAA 111: Basic Drawing I (2 Units C: PH 45)
This course is an introduction to basic drawing skills. The course aims to sharpen manual skills through exercises that stress the relationship between the drawing tool and the wrist and fingers, the coordination between the hand and the eyes, and the design and placement of objects on paper. Competence is honed through the exploration of analytical and expressive drawing to develop technical, intellectual, and observational skills.

DOU-SVG 111: Basic Draughtmanship I (2 Units C: LH 15, PH 15)
Draughting Instruments. Drawing methods and techniques. Typography and lettering. Introduction to Map Reading and Interpretation: Definition of map reading and interpretation, map/plan, types of maps, classification and function of map. Map scale; types and construction, vertical exaggeration of map scale, reduction and enlargement, conventional signs and symbols used on maps. Plotting of basic plans and maps.

GST 121: Nigerian Peoples and Culture (2 Units C: LH 30)
Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups).Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria).Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence).Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War).Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

MTH 121: Elementary Mathematics II (2 Units C: LH 30)
Function of a real variable, graphs, limits and idea of continuity. The derivative, as limit of rate of change. Techniques of differentiation. Extreme curve sketching. Integration as an inverse of differentiation. Methods of integration and definite integrals. Application to areas and volumes.

PHY 121: General Physics II (2 Units C: LH 30)
Heat, temperature and temperature scales. Gas laws; general gas equation, thermal conductivity. First Law of thermodynamics, heat, work and internal energy. Reversibility, second law of thermodynamics, heat engines and entropy. Zero's law of thermodynamics, kinetic theory of gases, molecular collisions and mean free path. Elasticity, Hooke's law, Young's, shear and bulk moduli. Hydrostatics, pressure, buoyancy, Archimedes' principles. Bernoulli's equation and incompressible fluid flow. Surface tension, adhesion, cohesion, viscosity, capillarity, drops and bubbles.

PHY 122: General Practical Physics II (1 Unit C: PH 45)
This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements, the treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

SVG 121: Introduction to Surveying and Geo-informatics (1 Unit Core: LH 15)
History of Surveying. Definition and procedural categories in Surveying. Principles, Classes and Uses of Surveying. Methods used in Surveying. Fields of study in Surveying. Practice of Surveying and Qualities of a Surveyor. National and International Surveying Organizations. Concept of Geographic Information System (GIS). Benefits and components of GIS. Definition, classes and units of measurements. Types, treatment of errors, precision and accuracy in Surveying measurements. Employment opportunities in Surveying and Geo-informatics. Basic concept, historical development and applications of Geo-informatics. Relationship among GIS, Geo-informatics and Geomatics Engineering. Geospatial data sources. Data models, format, quality and providers.

GEO 121: Introduction to Practical Geography (3 Units C: LH 15, PH 15)
The concepts of location. Types of location and place. Map scale. Characteristics of a map. Components of maps. Sizes of scale. Conversion from one scale type to another. Colours in topographic maps representation. Map enlargement and reduction. Relief representation. Contours. Types of slope. Types of landforms. Identification of cultural features from topographical sheet. Interpretation of topographical maps. Map interpretation procedure. Spatial Analysis. Concept of map symbols. Map analysis and interpretation. Analysis of point features. Analysis of linear features. Graphical representation of data.

DOU-SVG 121: Basic Draughtmanship II (2 Units C: LH 15, PH 15)
Plotting Instruments, Plotting plans, plotting using distance and bearing, plotting from coordinates. Anatomy of topographic and other maps. Methods of showing relief on maps, analysis and interpretation of contour representation of relief on maps, section drawing and profile, intervisibility and gradient. Plotting of contoured plans, horizontal profiles, etc.

DOU-SVG 122: Technical Drawing (3 Units C: LH 15, PH 15)
Introduction to technical drawing/building graphics. Identification of Common drawing instruments: T-squares, set squares, scales, pencils, dividers, compasses, protractors, irregular curves. Prepare drawing sheet with appropriate title block. Lettering: styles, guidelines, sizes, composition in lettering. Dimensioning: lines and symbols, sizes of dimensions, location, and standard detail. Bisecting straight lines, arcs and angles. Draw perpendicular to a given line, at a point on the line or from a point outside the line. Draw a line parallel to a given line. Divide straight lines and angles geometrically. Construct triangles given three sides. Construct triangles given two angles and one side. Construct triangles given two sides and included angle. Perimeter and proportion of sides. Altitude and base angles. Perimeter and base angle. Construct a square given the length of one side and the diagonal. Construct a rectangle given the length of the diagonal and one side. Construct a parallelogram given the lengths of two adjacent sides and an angle. Draw isometric, oblique and 1-and 2-point perspective drawings of geometric solids and simple models. Using Drawing Aids: grid, snap, isoplane settings. Draw orthographic projections of geometric solids and simple models using First angle or Third Angle projection.

GST 211: Philosophy, Logic and Human Existence (2 Units C: LH 30)
Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character moulding.

Concept of entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics

of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

SVG 211: Basic Surveying I (2 Units C: LH 15; PH 45)
Basic principles and methods used in ranging, chaining, off-setting, measurement of tie and check lines. Principles and methods used in chain surveying. Carrying out measurements and plotting of chain survey of an area. Sources of errors, corrections and accuracy attainable in chain surveying. Principles and methods used in compass surveys. Collection of field data, processing of data and production of plan at suitable scale in compass surveying. Principles and methods, field observations, computations, sources/correction of errors and production of plans at suitable scale in plane tabling.

SVG 212: Photogrammetry I (2 Units C: LH 15; PH 45)
General introduction to photogrammetry. Relationship of photogrammetry to land surveying, Remote sensing and GIS. Aerial and terrestrial photogrammetry. Classical and digital photogrammetry. Application areas of photogrammetry. Components of photogrammetric camera, photographic processes, distortions and resolution of film-based camera. Working principles and properties of digital cameras. Aerial Photography: classification according to camera axis inclination, angular coverage and photographic materials. Geometry of photographs. Image and object space and coordinate systems, photo scale, tilt, relief displacement and ground coverage. Photographs as perspective projections and difference from maps. Uses of stereoscopes, stereo-plotters (analogue, analytical and digital), comparators and orthoprojectors. Introduction to Photo Interpretation.

SVG 213: Cadastral Surveying I (2 Units C: LH 15; PH 45)
History, principles and methods of dealings in land tenure system in Nigeria. Customary land tenure systems in Nigeria. Right and interests in land and rights to land and natural resources. Deeds and title registration systems. Registrable Instruments and Deed Registry. Defects of deeds registration and title registration. Title registration act, registered land act and land use decree. Comparative analysis of land administration systems. Environmental coastal zone management. Law of the sea and delimitation of maritime boundaries.

SVG 214: Computer Applications in Surveying (2 Units C: LH 15; PH 45)
Introduction to basic computing, hardware and software systems. Basic computer maintenance. Flowchart, Algorithm and steps for program development in VISUAL BASIC, MATLAB and Python environments. Development and applications of computer routines and sub-routine for basic surveying computations like traversing, levelling, triangulation, areas and volumes of earth works. The use of computer packages for storage, processing, retrieval and analysis of geospatial data.

COS 211: Computer Programming I (3 Units C: LH 30; PH 45)
Introduction to computer programming. Functional programming; Declarative programming; Logic programming; Scripting languages. Introduction to object-orientation as a technique for modelling computation. Introduction of a typical object-oriented language, such as Java. Basic data types, variables, expressions, assignment statements and operators. Basic object-oriented concepts: abstraction; objects; classes; methods; parameter passing; encapsulation. Introduction to Strings and

string processing; Simple I/O; control structures; Arrays; Simple recursive algorithms; inheritance; polymorphism. Lab work: Programming assignments involving hands-on practice in the design and implementation of simple algorithms such as finding the average, standard deviation, searching and sorting. Practice in developing and tracing simple recursive algorithms. Developing programmes involving inheritance and polymorphism.

DOU-SVG 211: Elementary Cartography (2 Units C: LH 15, PH 15)
Fundamentals of Cartography. 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.

SVG 221: Geodetic Astronomy (2 Units C: LH 15; PH 45)

Variations in celestial coordinate system. Timing with stop watch and chronometer, time conversion and variations. Determination of azimuth by hour angle of E-W stars near Elongation. Determination of hour angle of the sun. Computation by hour-angle methods of the sun and correction to astronomic azimuth. Other methods of determining astronomic azimuth. Determination of latitude by circum-meridian altitudes, programme for circum-meridian observations. Observations and computations for the independent determination of latitude and longitude. Selection of pair E-W stars. Simultaneous determination of latitude and longitude (ASTROFIX). Laplace equation and stations and geodetic uses of astronomic positions.

SVG 222: Field Astronomy (2 Units C: LH 15; PH 45)
Nature of universe and solar, stellar and satellite systems. The motion of planets, Normal orbit, Kepler's laws and perturbed orbit of satellite. The motion and the relationship of the earth and the sun/star. Stars constellations, magnitude and distance of sun/star from the earth. Solution of astronomical triangle. Celestial coordinate system. Time system, Star catalogues and charts. Uses of stars almanac. Solar and stellar observations. Processing of observations for the determination of azimuth.

SVG 223: Cadastral Surveying II (2 Units C: LH 15; PH 45)
Principles and scope of cadastral surveying. Rules and regulations governing demarcation, organization and procedure for cadastral surveying. Field methods and office preparations for property surveys. Specifications for large scale cadastral surveying. Principles of sub-division of properties and layout design for surveying. Origins, establishment and re-establishment of beacons. Cadastral survey records. Intra/interstate, national and international boundaries. Control surveys. Location of sequence conveyance and reversion of right. Compensation and claim surveys. Procedures for land in dispute surveys. Process of land registration and professional conduct of surveyors.

SVG 224: Basic Surveying II (2 Units C: LH 15; PH 45)
Basic concept and types of traverses. Temporary and permanent adjustment of traverse instruments (Theodolite, EDM, Total Station and GPS). Field observations, Forward, Backward and area computations in traversing. Elementary adjustment of traverse network. Production of traverse plan at a suitable scale. Sources of errors and accuracy attainable in traversing. Basic concept, method and uses of leveling. Leveling with inverted staff, double and reciprocal leveling. leveling data collection, computation and elementary adjustment of level network. Sources of errors, corrections and accuracy

attainable in leveling. Principles, special features and uses of tachometry. Field observations, computations and production of plans at suitable scales from tachometry. Substance bar and its uses.

SVG 225: Surveying Computations (2 Units C: LH 30)
Basic concept and processes of surveying computations. Field and office computations, decimal and significant figures, accurate and inaccurate figures, rounding off and approximation. Care of computation machines. Methods used in surveying computation. Selection and manipulation of formulae for surveying computations. Computations of distances and angles with their various corrections. Computation of grid, magnetic, whole circle and reduced bearings from true bearing. Computations of rectangular coordinates from one station to the other, Computations of bearing and distances from coordinates of known points. Closing misclosure, treatment of misclosure and attainable accuracy. Area computations of surveying networks, Computation of omitted data in a closed network observation. Computations involved in the booking of field observations.

SVG 226: Surveying Instrumentation (2 Units C: LH 15; PH 45)
Basic principles, design, construction, sources of errors, accuracy attainable, uses and care of the following surveying equipment: Ranging poles, cross staves, optical square prism. Chains, wires, lines tapes, steel bands, Survey compasses, Tripods. Effect of diurnal variations, magnetic, storms and local attraction on compass. Different types and uses of levels, parts of levels and leveling staves. Sub tense bar, Range finder, Parallax bar, Stereoscope, Plan meter, Pantograph, Coordinatograph, Plane-table and other elementary surveying Instruments. Working principles, construction, classification, calibration, types, uses, care, sources of errors, accuracy attainable, temporary and permanent adjustment of the following surveying instruments: EDMs, Theodolites, Levels, Tachometers, Altimeter, Psychomotor, Gravimeter, Doppler shift frequency, Laser, Global Positioning System (GPS), Total station Instruments targets/reflectors, Digital Plotters and scanners, Comparators and Drone.

DOU-SVG 221: Electronic Surveying (3 Units, Core, LH 15)
History of electronic surveying. Properties of electronic 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. Group velocity, transmitters, receivers and antennal. 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). EDM Equipment Systems: Basic Principles of EDM, Classifications, applications and comparison with conventional surveying. Errors - instrumental and atmospheric. 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). Modern positioning systems: Total station - Setting out works - Baseline Measurement, EDM traversing: observations and computation of area, Trilateration. Interferometric methods of baseline measurements

GST 311: Peace and Conflict Resolution (2 Units C: LH 30)
Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; ZangoKartaf, Chieftaincy and Land disputes. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government and Community Leaders). Elements of

Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration. Roles of International Organizations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 311 Venture Creation (2 Units C: LH 15; PH 45)

Opportunity Identification (Sources of business opportunities in Nigeria. Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research. Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research).Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organizations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, Ecommerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Block chain, Cloud Computing, Renewable Energy among others. Digital Business and ECommerce Strategies).

SVG 311: Photogrammetry II (2 Units C: LH 15; PH 45)

Stereoscopy, parallax and height determination. Procedure for interior, relative and absolute orientations. Strip and block formation, stereo-model error analysis. Aero-triangulation by independent models. Stereoscopic models. Model and photo-coordinate systems, measurement and correction of image coordinates. Mathematical relationships between image and object space. Conformal, affine and projective equations. Rotation, Collinearity and Coplanarity conditions and equations. Space resection and intersection, analytical relative and absolute orientations. Introduction to analytical plotting. Terrestrial photogrammetry methods and applications. Photogrammetric data processing.

SVG 312: Remote Sensing I (2 Units C: LH 15; PH 45)

Basic concept of Remote Sensing, Electromagnetic radiation and spectrum. Energy interaction with atmosphere and earth surface. Spectral reflectance curves. Passive and active sensing. Platforms, sensors and resolution. Satellite orbital types and characteristics. Overview of popular active sensors which includes MeteoSat, NOAA, LandSat, SPOT, Ikonos, and Quick Bird. Aerial survey missions such as UAVs. Radiometric, spectral, spatial and temporal resolutions and multispectral imagery. Image analysis, visual interpretation and image classification. Presentation of remote sensing data and results.

SVG 313: Mining and Special Survey (2 Units C: LH 15; PH 45)

Basic concept of mining and underground surveying techniques. Design of underground survey networks. Mine orientation, mechanical and optical shaft plumbing gyroscopic methods, laser and

accuracies obtainable. Operation, sources of errors and accuracy obtainable for gyro theodolite. Volume determination, erosion problems and crustal movements. Survey for subsidence and stability of large structures.

SVG 314: Cadastral Surveying III (2 Units C: LH 15; PH 45)
Property laws and survey regulations. Chapter 194 of the laws of the Federation and other relevant survey legislations, decrees and their amendments. Laws in mining Surveys, Rights of way and town planning laws. Land Use Act and Land Information System. Professional practice and body. Control of the profession and code of ethics. Costing of cadastral, topographical, engineering, hydro graphic surveys and other mapping projects.

GEY 314: Principles of Geophysics (2 Units, C, LH 30)
Definition. Types of geophysical surveys. Active and passive techniques of geophysical surveys. Techniques of geophysical surveys. Exploration applications. Design of geophysical surveys. Planning of geophysical surveys. Typical constraints of geophysical surveys. Gravimetric exploration. Gravity reduction and gravity anomaly. Components of gravity anomaly. Applications of gravity anomaly. Seismic exploration. Electrical geophysical surveys. Magnetic geophysical surveys. Field observation and data acquisition. Interpretation of results in gravimetric, seismic, magnetic and electrical methods of geophysical surveys.

DOU-SVG 311 - Database Design and Application I (2 Units, Core, LH 15, PH 15)
Introduction to Database, Database Environment, Relational Model, Relational Algebra, Draw ER modelling, Normalization, SQL practice. Users and Uses of GIS, Open-source GIS and Open Data, Spatial statistics (hotspot analysis), geographical data generalisation. Other sources of spatial data: smart buildings, smart cars/, Autonomous Vehicles, Building Information Management will learn how to use Esri's ArcMap Online product to build story maps using qualitative and quantitative data. Application of GIS in Virtual, augmented, and mixed realities. Mobile, real time, cloud GIS. Integration of GIS with Remote Sensing data. Application of GIS is crime, Land suitability analysis using different methods, land cover change modelling etc.

SVG 321: Geodetic Surveying (2 Units C: LH 15; PH 45)
Basic concept of geodetic surveying. Design, specifications, observational procedure, accuracy attainable for geodetic surveying. Control surveys using triangulation, trilateration and traversing, geodetic leveling. Determination of normal, dynamic and orthometric heights. Satellite station, Laplace station and equations for the control of geodetic surveys. Sources of errors and application of appropriate corrections. Computations of geodetic coordinates. Adjustment of geodetic survey networks. Production of geodetic reports and plans. Deformation surveys and monitoring of large structure.

SVG 322: Adjustment Computation I (2 Units C: LH 30)
Review of matrix algebra. Theory and propagation of errors. Principles and methods of survey network adjustment. Non-least squares adjustment methods like Bowditch, transit, equal shift and unaltered bearing adjustment methods. Braced quadrilateral and centered polygon adjustment. Linear and nonlinear models, Linearization. Methods of solving systems of linear equations: Direct (ad joint, crammer, elimination/substitution, bordering, Cholesky) methods and indirect or iterative (Jacobi, Gauss-Siedel, SOR) methods. Introduction to least squares adjustment.

SVG 323- Geographic Information System (2 Units C: LH 15; PH 45)
Basic concept and uses of GIS. Components of GIS and its relationship to CAD and BIM. GIS data input, sources and integration. Spatial data models: discrete vs. continuous data, 2D, 2.5D, 3D and 4D data. Vector and raster data types. Non-spatial or attribute data. GIS reference system and geodetic datum. Data formats, standards and providers. Topology and spatial relationship. Data

analysis toolbox (Selection, buffer, overlay). Data query, GIS output and visualization. Web mapping and location-based services. Temporal GIS and GIS packages. GIS data management. Data encoding principles and equipment. Raster-to-vector conversion. Editing and error analysis. Data scale and accuracy. Database structures, ordered and indexed lists, hierarchical, network, relational, object-oriented and hybrid structure. Standards and practice, creation, maintenance, distribution of metadata. Control terrain representation and analysis. Network models and analysis. GIS applications in utility management, environmental monitoring and assessment, land management, engineering.

SVG 324: Engineering Surveying (2 Units C: LH 15; PH 45)
Basic concept of Engineering Surveying. Feasibility study in engineering surveying. Primary line and control for mapping an area. Route Surveys. Definition, classification and uses of curves and curves formulae. Methods of setting out simple, compound, reverse, transition and vertical curves. Longitudinal and cross sectioning. Super-elevation. Setting out with theodolites, rectangular grid and polar coordinates. Establishment and construction of benchmarks and industrial setting out. Computation of area and volumes of earthwork using trapezoidal rule, Simpson and prismoidal rules, graphical and give and take methods. Cuttings and embankments, Eccentricity, Pappus theorem and Mass haul diagram.

SVG 325: Topographic Surveying (2 Units C: LH 15; PH 45)
Principles and uses of topographic maps/plan. Methods of obtaining field data for topographic surveys such as traversing, leveling, tachometry, triangulation, trilateration, intersection, resection planning, office and field recce, observations, field completion and detail survey, computations and adjustment. Contouring and production of other topographic maps/plans.

DOU -SVG 321: Survey Camping (3 Units; Core, PH 45)
The period of the camping is three to four weeks. Students will carry out observation using various methods of position determination such as traversing, triangulation, trilateration, resection, intersection, etc., using Theodolite, EDM, Total station, GNSS receivers, etc. Trigonometric and differential (spirit) levelling. Processing of the acquired data (computation, level reduction and adjustment). Plotting of the surveys. The survey will consist of not less than nine unknown stations. Observation and computation of the Azimuth of a line. A point latitude and longitude determination using the Astronomical method. Application of laser scanner and drone for data acquisition. DOU-

DOU-SVG 322: Cartography and Map Creation (2 Units, Core, LH 15, PH 15)
Map Compilation, Generalization and Classification. Map Reproduction Techniques, Photo-litho processes, Photomaps, Ortho photomaps, Map revision processes. Depiction of relief. Transfer of details from map to map, map orientation.

DOU-SVG 323: Potential Theory and Spherical Harmonics (2 Units, Core, LH 15, PH 15)
Fundamentals of potential theory: Harmonics functions, Legendre's functions and spherical harmonics. Boundary value problems of potential theory and their applications to the representation of earth's gravity field.

SVG 411: Photogrammetry III (2 Units C: LH 15; PH 45)
Review of photo-coordinates determination. Collinearity and Coplanarity principles, bundle and block adjustments. Processes and tasks involved in digital photogrammetry. Generic digital photogrammetry environment and integration with GIS and CAD systems. Software & hardware requirements for digital photogrammetry and digital photogrammetric work stations. Advantages and characteristics of digital images. Spatial, radiometric and spectral resolutions, geometric accuracy, digitization, sampling, quantization of grey levels and noise. Data acquisition for digital

photogrammetry using digital cameras, scanners. Data compression, image processing, image enhancement and restoration techniques and image resampling.

SVG 412: Adjustment Computation II (2 Units C: LH 30)
Partitioning and diagonalisation of matrix. Principles of Least Squares Adjustment (LSA). Condition equations, observation equations, combined (mixed) model equations methods of LSA. Design of weight matrices in LSA. Weight and functional constraints. Treatment of large geodetic networks. Addition and removal of observations and parameters. Statistical analysis, error ellipse and error ellipsoid. Application of LSA in Surveying and Geo-informatics.

SVG 413: Remote Sensing II (2 Units C: LH 15; PH 45)
Analytic digital image processing system. Computer imaging systems, image representation in colour space. Image sampling quantization, quality measurement, data products, storage and retrieval. Photo systems and dip systems. Pre-processing (Encoding and decoding). Sources of image degradation, atmospheric, radiometric and geometric errors, systematic and nonsystematic correction and 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 and texture analysis. Image classification, spectral discrimination pattern, matching Baye's theorem-signature and feature extraction and training. 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 applications, Integration of Remote Sensing and GIS.

SVG 414: Map Projection (2 Units C: LH 30)
Basic concept, theory and uses of map projection. Representation of the earth's surface by physical and mathematical figures. Geometry of the ellipse and reference ellipsoids. Coordinate systems (Cartesians, spherical and ellipsoidal), Computations on spherical and ellipsoidal surfaces. Types of geodetic reference systems, computational procedures and coordinate transformation methods. Projection systems: plane, conic, cylindrical, conformal, equidistance, equivalent, azimuthal projections, convergence, line scale factor, arc-to-chord correction. Concept of conformal projection, Transverse Mercator (TM), Nigeria Traverse Mercator (NTM) and Universal Transverse Mercator (UTM). Transformation of coordinates from geographic to NTM and UTM and vice versa.

SVG 415: Hydro-graphic Surveying I (2 Units C: LH 15; PH 45)
Basic concept of hydro graphic surveying. Z-dimensional positioning at sea and on water. Depth determination, tides and mean sea level. Sounding methods and position fixing at sea. Three point problem, Strength of fix, Sextants and station pointer. Positioning accuracies, measuring systems and sources of errors. Navigation and positioning, tides and tidal streams. Chart and sounding Datums. Mean sea level determination. Tide gauge and poles. River surveys and measurement of current and discharge.

DOU-SVG 411 - GIS Tools and Applications (2 Units C: LH 15, PH 15)
GIS subsystems. Data collection and input. Data storage and retrieval. Data manipulation and analysis. Visualization and reporting. Structured Query Language (SQL). Database Management System (DBMS) types and functions. Review of some existing GIS software. Database design steps and implementation. Specific study of a topic under one of the chosen topics: GIS for retail store location and revenue prediction, GIS for epidemiology and health care planning and Environmental Information System. The study to focus on concept, design considerations, data requirements and modelling, selection of implementation hardware and software.

DOU-SVG 412 - Practical for Surveying and Geoinformatics Students (3 Units C: PH 30)
Project design and analysis: Survey specifications, equipment calibration, reconnaissance, design of survey control points, resection, traversing, differential levelling, and mapping. Error analysis, error figures and error visualization using a graphical approach. Pre-analysis, design, observation and computation, post analysis and interpretation of results. Develop a deep understanding of surveying observations and their errors and apply it in design of control surveys that efficiently meet client requirements. Students learn operational principles of instruments, behaviour and mitigation of observation errors, interpretation of specifications for surveys, and design and analysis of control surveys. Angle, azimuth, distance, and height difference observables are covered. Issues of occupational health and safety in survey design will also be addressed. Surveying Design Practicum: Apply principles of survey design and analysis to a control survey involving total station, differential levelling, and GNSS observations. Students undertake two weeks of practical exercises in survey planning, execution, and analysis. Management of occupational health and safety is discussed and applied in field operations.

DOU-SVG 413- Digital Mapping Methods (2 Units C: LH 15, PH 15)
Conversion of analogue Data to Digital- Table Digitizing, Automatic digitizing. Digital image acquisition. Software configuration for mapping. Digital Data Structures. Digital preparation of maps and plans. Digital interpolation and construction of contour lines. Digital Image Processing (DIP) techniques and Computer vision concepts.

SVG 511: Aerial Triangulation (2 Units C: LH 15; PH 45)
Basic concept of aerial triangulation. Analogue and digital aerial triangulation. Strip formation, strip and block adjustment. Perspective centre determination. Independent model aerial triangulations. Multiple photo resection. Bundle adjustment of photographs. Flight Planning and procedure of aerial triangulation leading to production of map/plan.

SVG 512: Hydro graphic Surveying II (2 Units C: LH 15; PH 45)
Sounding, wave propagation, Mathews chart and vertical beam, Echo Sounder instrumentation, operation and calibration. Acoustic waves. Ports development and management. Sweeping, side looking sonar, multibeam sonar and electronic sweeping. Elements of Oceanography, tides, currents, temperature, salinity, dredging and channelization. Pressure measurement, sedimentation and beach erosion. Modern techniques in hydro graphic, bathymetric survey in reservoirs and sediment monitoring in reservoirs using bathymetric data.

SVG 513: Photogrammetry IV (2 Units C: LH 15; PH 45)
Review of least squares application in photogrammetry. Collinearity and Coplanarity concepts and least squares methods in relative orientation. Strip, bundle and block adjustments. Systematic effects in photogrammetry. Image matching, DTM generation, digital orthophoto creation. Digital line map production, digital monoplotting. Digital photogrammetry using appropriate software. Principles and methods of photogrammetric mapping using Drone technology. Computer applications in photogrammetric projects.

SVG 514: Research Method (2 Units C: LH 30)
Review of methodologies in Surveying and Geo-informatics. Techniques in research methods. Identification of research problems, review of related literature and justification for the research. Description of data source, acquisition, quality and presentation of data, processing of data. Presentation and analysis of results, research findings, conclusions, recommendations and research contributions to knowledge. References and appendices.

DOU-SVG 511: Project Management for Surveyors (2 Units, Core, LH 30)
The definition of project management. Choice of project. Choice of services. Production planning. Production development. Choice of technology. Fiscal feasibility assessment. Economic analysis.

Financial feasibility assessment. Evaluation of infrastructural facilities. Site selection. Cost/benefit analysis. Project finance. Source of capital. Cost of capital. Risk management. Time management. Scope management.

DOU-SVG 512: Seminar (2 Units, Core, LH 30)
Introduction to seminar presentation. Overview of topical geospatial issues. Independent research. Reconnaissance. Research preparation. Research presentation. Research problems. Research trends. Data abstraction. Data mining. Data outsourcing. Data comparison. Team work by students. The use of internet. The use of library. Research collaboration. Research publication.

DOU-SVG 513: Coastal and Marine Studies (3 Units, Core, LH 30)
Coastal surveys. Coastal Engineering. Coastal Management and Development. Harbour Surveys. Demarcation of Harbour limits and Laws. Surveys for dredging and Applications. Hydrographic Project Costing. Managements and Applications. Port Development. Port Management. Introduction to Geophysical Surveys. Maritime Boundaries (Territorial Sea and Internal Waters). Base Lines. Continental Shelf. Exclusive Economic Zone. Contiguous Zone. Maritime Boundary Delineation: Equi-ratio and Equidistant methods.

SVG 521: Geometric Geodesy (2 Units C: LH 30)
Basic concept of geodesy. Aims and historical development of geodesy. Methods used in Geodesy and factors used for the classification in Geodesy. Representation of the figure of the earth. Coordinate systems like terrestrial and celestial coordinate systems, satellite coordinate system, inertial coordinates, curvilinear and Cartesian coordinate systems. Three-dimensional geodesy, Relative and absolute geodetic positioning. 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.

SVG 522: Satellite Geodesy (2 Units C: LH 15; PH 45)
Basic concept of satellite geodesy. Geometric and dynamic techniques. Methods of observations. Satellites orbits, normal/perturbed orbits. Mathematical model, error behavior and applications of satellite techniques. Types of satellites. Very Long Baseline Interferometry (VLBI), Satellite laser ranging and satellite altimetry. Anatomy of Global Position System (GPS). Description, observations, mathematics models, error analysis, software structure and data processing in GPS. Classical and modern 3–Dimensional approaches to geodetic networks. Global coordinate system and applications of satellite to positioning and figure of the earth, gravity field determination and geodynamics.

SVG 523: Physical Geodesy (2 Units C: LH 30)
The earth and its gravity field. Gravitation, gravity and potential. Geoidal undulation and deflections of the vertical, geo potential numbers, orthometric, dynamic and normal heights. Size and shape of the earth, geoid as figure of the earth and other approximations. Gravity observations, absolute and relative gravity values, gravity reduction and gravity anomalies. Inverse problem in physical geodesy. Gravimetric, astro-geodetic, astro-gravimetric and satellite altimetry methods of determining the figure of the earth.

SVG 599: Project Dissertation (4 Units C: PH 180)
Identification of all types of projects of interest in Survey and Geo-informatics. Choosing, design and planning of project. Acquisition of data, quality assessment of data, documentation, and processing of data. Analysis of results and plotting of map/plan. Production of technical report on the project.

DOU-SVG 521: GNSS Theory and Applications (3 Units, Core, LH 15, PH 15)

The concept of GNSS. Difference among the GPS, GLONASS, Galileo, and Beidou. Workings of the Handheld GPS. Differential GPS. Pseudorange observation. Point positioning. Differential positioning. Carrier phase observation. Relative positioning and differencing techniques. Ambiguity resolution methods. Sources of errors in GPS. Different modes of GPS positioning. Practical field observations. Data processing. The concept of Continuously Operating Reference Stations (CORS). Analytical analysis of CORS. Processing CORS data.

DOU-SVG 522: Surveying Laws, Regulations and Professional Practice (2 Units, Core, LH 30)

The evolution of Nigerian survey laws and regulations. Study of laws of the Federal Republic of Nigeria. Acts of Parliament. Military decrees relating to survey practice. Military edicts relating to survey practice. Survey coordination act. Surveyors Registration Council. Comparison of survey laws of other countries. Interplay between state and federal survey regulations. Interplay between state and federal survey implementation. Application to cadastral surveys. Land use act. GPS surveys. Photogrammetric surveys. Remote sensing applications. Costing of survey. Private prohibitions Decree No 34. 1981.

BMAS - Course Structure and Contents

100-LEVEL

FIRST SEMESTER				
S/N	**Course Code**	**Course Title**	**Units**	**Status**
1	GST 111	Use of English & Library	2	R
2	GST 112	Logic, Philosophy & Human Existence	2	R
3	FES 111	Introduction to Environmental Sciences	2	C
4	URP 111	Introduction to Land Use Planning	2	C
5	MTH 111	General Mathematics I (Algebra & Trig)	2	C
6	PHY 111	General Physics I	2	C
7	PHY 112	General Physics I Practical	1	C
8	BLD 113	Building Graphics I	2	C
9	CSC 111	Introduction to Computer Science	2	C
10	SVG 111	Elementary Land Surveying I	2	C
		Total	**19**	
SECOND SEMESTER				
S/N	**Course Code**	**Course Title**	**Units**	**Status**
1	GST 121	Nigerian Peoples & Culture	2	R
2	GST 122	History and Philosophy of Science	2	R
3	PHY 121	General Physics II	2	C
4	PHY 122	General Physics II Practical	1	C
5	MTH 121	General Mathematics II (Calculus)	2	C
6	ARC 123	Free Hand Sketching II	2	C
7	ARC 126	Planning and the Built Environment	2	C
8	FES 121	Introduction to Practical Geography	2	C
9	SVG 121	Elementary Land Surveying II	2	C
		Total	**17**	

200-LEVEL

FIRST SEMESTER				
S/N	**Course Code**	**Course Title**	**Units**	**Status**
1	SVG 211	Topographic Surveying	2	C
2	SVG 212	Cadastral Surveying I	2	C
3	SVG 215	Electronic Surveying I	2	C
4	SVG 216	Field Astronomy	2	C
5	SVG 217	Computer Application in Surveying	2	C
6	URP 212	Land Economics I	2	R
7	URP 213	Planning Principle and Practice	2	R
8	GEY 211	Physical Geology	2	R
9	STA 211	Statistics for Agriculture, Biological Science and Physical Science	3	C
10	CSC113	Introduction to Computer Programming with Python I	2	R
		Total	**21**	

SECOND SEMESTER				
S/N	**Course Code**	**Course Title**	**Unit**	**Status**
1	SVG 221	Cadastral Surveying II	2	C
2	SVG 222	Geodetic Astronomy	2	C
3	SVG 223	Map Projection	2	C
4	SVG 224	Geodetic Surveying	2	C
5	SVG 225	Elementary Cartography	2	C
6	SVG 226	Geometric Photogrammetry	2	C
7	URP 221	Environmental Planning and Management	2	R
8	MTH 223	Introduction to Numerical Analysis	3	C
9	CSC 223	Sequential Programming in Assembly Language with a Microcontroller	3	R
10	GST 221	Introduction to Entrepreneurship	2	R
		Total	**22**	

300-LEVEL

FIRST SEMESTER				
S/N	**Course Code**	**Course Title**	**Units**	**Status**
1	SVG311	Mining and Special Survey I	2	C
2	SVG312	Adjustment Computation I	2	C
3	SVG313	Analogue Photogrammetry	2	C
4	SVG314	Remote Sensing I	2	C
5	GST 311	Skill Acquisition	2	C
6	CSC314	Computer Architecture and Organisation I	3	C
7	CSC313	Systems Analysis and Design CSC 313	3	C
8	PHY331	Introduction to Geophysics	2	R
9	MTH311	Introduction to Mathematical Modelling	3	C
10	MTH332	Numerical Analysis I	3	C
		Total	**24**	

SECOND SEMESTER

S/N	Course Code	Course Title	Units	Status
1	SVG321	Geographic Information Systems I	2	C
2	SVG322	Land Surveying	2	C
3	SVG323	Analytical Photogrammetry	2	C
4	SVG324	Cadastral Surveying III	2	C
5	SVG325	Hydrographic Surveying I	2	C
6	STA322	Survey Methods and Sampling Theory	2	R
7	CSC123	Framework-Based Web Development with Django	2	C
8	PHY225	Electronics I	2	R
9	MTH227	Introduction to Operation Research	3	C
10	FES321	Cartography	2	R
		Total	**21**	

400-LEVEL

FIRST SEMESTER				
S/N	**Course Code**	**Course Title**	**Units**	**Status**
1	SVG411	Hydrographic Surveying II	2	C
2	SVG412	Entrepreneurship Studies	2	C
3	SVG413	Aerial Triangulation	2	C
4	SVG414	Geometric Geodesy	2	C
5	SVG415	Research Methods I	2	C
6	SVG416	Digital Mapping	2	C
7	SVG 417	Geographic Information Systems II	2	C
8	SVG418	Terrain Evaluation	2	C
9	SVG419	Remote Sensing II	2	C
10	GEO411	Environmental and Resources Management	3	R
11	GST 311	Skill Acquisition	2	C
		Total	23	
SECOND SEMESTER (industrial training)				
S/N	**Course Code**	**Course Title**	**Units**	**Status**
1	SVG 421	SIWES	6	C
		Total	6	

500-LEVEL

FIRST SEMESTER				
S/N	**Course Code**	**Course Title**	**Units**	**Status**
1	SVG 511	Adjustment Computation II	2	C
2	SVG 512	Engineering survey	2	C
3	SVG 513	Advanced Land Surveying	2	C
4	SVG514	Mining and Special Survey II	2	C
5	SVG515	Physical Geodesy	2	C
6	SVG516	Marine Surveying	2	C
7	SVG517	Cadastral Surveying IV	2	C
8	SVG518	Computational Photogrammetry	2	C
9	SVG519	Electronics Surveying II	2	C
10	SVG531	Research Method II	2	C
		Total	20	

SECOND SEMESTER				
S/N	**Course Code**	**Course Title**	**Units**	**Status**
1	SVG521	Project Dissertation	6	C
2	SVG522	Satellite Geodesy	2	C
3	URP 527	Environmental Law	2	R
4	URP 520	Politics of Development	2	R
5	EMT524	Soil Erosion and Environmental Management	2	R
6	EMT528	Environmental Impact Assessment	2	R
7	EMT529	Environmental Audit	2	R
		Total	18	

100 LEVEL FIRST SEMESTER

CSC 111: Introduction to Computer Science (2 Units)
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.

SVG 111: Elementary Land Surveying I (2 Units)
General history of Surveying and Geoinformatics. Fields of study of Surveying and Geoinformatics. Definitions, principles and applications of Surveying and Geoinformatics in related fields and national economy. Old and new instruments used in Surveying and Geoinformatics. Chain surveying: Recce, chains, tapes, ranging poles, arrows, offsets, sources of errors, accuracy, corrections, and chain survey of parcel of land not less than $3000m^2$ with varied details of proper layout in triangles, baselines, chaining, detailing of offsets, area computation, booking in field book, and plotting of survey and presentation. Compass surveying: Azimuth and bearing, magnetic orientation, ranging poles, arrows, offsets, sources of errors, accuracy, corrections, and compass survey of parcel of land not less than $3000m^2$ with varied details of proper layout in triangles, baselines, adjustment of compass survey, detailing of offsets, booking in field book, and plotting of survey and presentation.

100 LEVEL SECOND SEMESTER

SVG 121: Elementary Land Surveying II (2 Units)
Electronic distance measurement, theodolite, total station, level, and Global Navigation Satellite System (GNSS) equipment. Introduction to traversing and levelling. General analysis of zero order, first order, second order, and third order traversing and levelling operations. Horizontal and vertical controls. Zero order, first order, second order, third order horizontal and vertical controls. Types of beacons for zero order, first order, second order, and third order controls. Perimeter traverse survey of not less than 1.2km. Production and emplacement of beacons. Traversing, triangulation and trilateration operations. Position resection and intersection. Levelling: general levelling operations, spirit levelling, profile levelling, inverse levelling, grid levelling, contouring, and topographic surveys. Route survey: longitudinal section (profile) and cross-section. Longitudinal section of not less than 5km, and cross-section of not less than 3km. Traverse and levelling computation and plotting. Analytical applications in traverse and levelling operations.

200 LEVEL FIRST SEMESTER

SVG 211: Topographic Surveying (2 Units)
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.

SVG 212: Cadastral Surveying I (2 Units)
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.

SVG 215: Electronic Surveying I (2 Units)
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.

SVG 216: Field Astronomy (2 Units)
The nature of the universe and the solar system. The celestial sphere. Solution of spherical triangles. Astronomical coordinate systems. Astronomical triangle. Time system. Star catalogues and charts. Use of star almanac for surveyor. Solar and stellar observations. Astronomical and instrumental corrections to observed altitudes and azimuths. Determination of azimuth: ex-meridian altitudes of sun or star. Hour angle of polaris or octantis; circumpolar star near elongation. Determination of longitude: altitude of east-west sun or east-west star. Position line methods. Field procedures, instrumentation and computations. Sources of error and their correction.

SVG 217: Computer Applications in Surveying (2 Units)
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.

URP 212: Land Economics I (2 Units)
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 213: Planning Principle and Practice(2 Units)
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.

GEY 211: Physical Geology (2 Units)
Planet Earth: its composition from core to crust. Minerals; rocks and weathering. Surface processes and landforms, major earth structures. Practical identification of common rock- forming minerals and rocks; interpretation of topographical and simple geologic maps.

STA 211: Statistics for Agriculture, Biological Science and Physical Science(3 Units)
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.

CSC113: Introduction to Computer Programming with Python I (2 Units)
Introduction to problem solving methods and algorithm development, designing, coding, debugging and documenting programmes using techniques of a good programming language style, programming language and programming algorithm development. Implemented with the Python programming language.

200 LEVEL SECOND SEMESTER

SVG 221: Cadastral Surveying II (2 Units)
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.

SVG 222: Geodetic Astronomy (2 Units)
Coordinate systems and their variations: precession, nutation, polar motion and proper motion. Reduction of star positions. Time systems: sidereal, universal, ephemeris and atomic. Time conversions and variations. Determination of first and second order astronomic positions azimuths: theory, instrumentation, computation and analysis of results. Reduction of observations. Geodetic uses of astronomic position. Astrogeodetic geoids.

SVG 223: Map Projection (2 Units)
Basic concept, theory and uses of map projection. Representation of the earth's surface by physical and mathematical figures. Geometry of the ellipse and reference ellipsoids. Coordinate systems (Cartesians, spherical and ellipsoidal), Computations on spherical and ellipsoidal surfaces. Types of geodetic reference systems, computational procedures and coordinate transformation methods. Projection systems: plane, conic, cylindrical, conformal, equidistance, equivalent, azimuthal projections, convergence, line scale factor, arc-to-chord correction. Concept of conformal projection, Transverse Mercator (TM), Nigeria Traverse Mercator (NTM) and Universal Transverse Mercator(UTM). Transformation of coordinates from geographic to NTM and UTM and vice versa

SVG 224: Geodetic Surveying (2 Units)
Higher order Surveying instruments: Use, Care, accuracy, Control Surveys. Design of 1^{st} and 2^{nd} order control systems. Positioning methods. Precise levelling. Computations of geodetic positions. Semi-rigorous and rigorous adjustment of control networks.

SVG225: Elementary Cartography(2 Units)
Fundamentals of Cartography (Cartography today, Nature of Cartography, History of Cartography, Cartographic, Visualization, Web Cartography, Graticule, 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.

SVG 226: Geometric Photogrammetry (2 Units)
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.

URP 221: Environmental Planning and Management (2 Units)
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.

MTH 223: Introduction to Numerical Analysis (3Units)
Solution of algebraic and transcendental equations. Curve fitting. Error analysis. Interpolation and approximation. Zeros or non- linear equations 'to one variable'. Systems of linear equations. Numerical differentiation and integral equations. Initial value problems for ordinary differential equation.

CSC223: Sequential Programming in Assembly Language with a Microcontroller (3 Units)
The relationship between H/L languages and the Computer Architecture that underlies their implementation: basic machine architecture, specification and translation of P/L Block Structured Languages, parameter passing machines.

300 LEVEL FIRST SEMESTER

SVG 311: Mining and Special Surveys (2 Units)
Definitions. Mining and underground surveying Techniques. Design of underground survey networks. Mine orientation, mechanical and optical shaft plumbing gyroscopic methods, laser etc, Accuracies.

SVG 312: Adjustment Computation I (2 Units)
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.

SVG 313: Analogue Photogrammetry (2 Units)
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.

SVG 314: Remote Sensing I (2Units)
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.

CSC 313: Systems Analysis and Design (3 Units)
System Concept; System Development Life Cycle Analysis: Fact gathering Techniques, data flow diagrams, Process description data modelling. System Design: Structure Charts, form designs, security, automated Tools for design.

CSC 314: Computer Architecture and Organization I (3 Units)
Fundamental building blocks, logic expressive immunization, sum of product forms. Register transfer notation, Physical considerations. Data representation, and number bases, Fixed and Floating-point systems, representation memory systems organization and architecture.

PHY331 Introduction to Geophysics (2 Units)

MTH 332: Numerical Analysis I (3 Units)
Polynomial and splines approximation. Orthogonal polynomials and Chebyshev approximations. Direct and interactive methods for the solution of systems of linear equations. Eigen value problem – power methods, inverse power methods. Pivoting strategies.

MTH311 Introduction to Mathematical Modelling (3 Units)

300 LEVEL SECOND SEMESTER

SVG321 Geographic Information Systems I (2 Units)
Basic concept and uses of GIS. Components of GIS and its relationship to CAD and BIM. GIS data input, sources and integration. Spatial data models: discrete vs. continuous data, 2D, 2.5D, 3D and 4D data. Vector and raster data types. Non-spatial or attribute data. GIS reference system and geodetic datum. Data formats, standards and providers. Topology and spatial relationship. Data analysis toolbox (Selection, buffer, overlay). Data query, GIS output and visualization. Web mapping and location-based services. Temporal GIS and GIS packages.GIS data management. Data encoding principles and equipment. Raster-to-vector conversion. Editing and error analysis. Data scale and accuracy. Database structures, ordered and indexed lists, hierarchical, network, relational, object-oriented and hybrid structure. Standards and practice, creation, maintenance, distribution of metadata. Control terrain representation and analysis. Network models and analysis. GIS applications in utility management, environmental monitoring and assessment, land management, engineering.

SVG 322: Land Surveying (2 Units)
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 levelling, Single and reciprocal observations, Precise levelling, 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.

SVG 323: Analytical Photogrammetry (2 Units)
Refinement of comparator measurements. Calibration of the Camera, the comparator and the stereoplotter. Collinearity Equations. Coplanarity condition equations, Errors, Weights.

SVG 324: Cadastral Surveying III (2 Units)
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.

SVG 325: Hydrographic Surveying I (2 Units)
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.

STA 322: Survey Methods and Sampling Theory (2 Units)
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.

CSC 121: Introduction Computer Programming with Python II (2 Units)
Project based application of basic programming concepts such as Variables and Simple Data Types, Lists, Sets, Arrays, Tuples, Dictionaries, Control Structures, Functions, Classes, Files and Exceptions, in solving real-world problems such as, Desktop Application Design, Game Design, Graphics and Data Visualisation or Web Design. Implemented with the Python programming language.

PHY225 Electronics I (2 Units)

MTH227: Introduction to Operations Research (3Units)
The nature of operations research, allocation problems, inventory problems; replacement, maintenance and reliability problems. Dynamic programming, sequencing and coordination.

FES 321: Cartography (2 Units)
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.

SVG 411: Hydrographic Surveying II (2 Units)
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.

SVG 412: Entrepreneurship Study (2 Units)
Students will learn a broad array of tools to more efficiently manage scarce resource in a venture. Applied approaches to asset and liability management.

SVG 413: Aerial Triangulation (2 Units)
Analogue Aerotriangulation. Strip formation. Strip and Block adjustment. Perspective Centre determination. Independent model aerotriangulations. Multiple photo resection. Bundle Adjustment of photographs. Flight Planning.

SVG 414: Geometric Geodesy (2 Units)
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.

SVG 415: Research Methods I (2 Units)
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.

SVG 416: Digital Mapping (2 Units)
Digital data capturing and processing hardware and software. Total stations, digital levels, GNSS receivers, terrestrial scanners, digital representation of graphic objects: point, line, and polygon elements; 2D graphics; cartographic symbols and placements. Review of coordinates transformation. Terrain mapping analysis.

SVG 417 Geographic Information Systems II (2 Units)
Raster and Vector data representations. Raster and vector data models and structure. Topology Building. Use of topological relationship in GIS. GIS analysis and modeling.

SVG 418: Terrain Evaluation (2 Units)
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.

SVG 419: Remote Sensing II (2 Units)
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.

SVG 511: Adjustment Computation II (2 Units)
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.

SVG 512: Engineering Surveying (2 Units)
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.

SVG 513: Advanced land surveying (2 Units)
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.

SVG 514: Advanced land surveying (2 Units)
The gyrotheodolite, sources of errors and accuracies, volume determination in mining area. Crustal movements and deformation, Erosion problem, Survey for subsidence and stability of large structure. Survey of boreholes.

SVG 515: Physical Geodesy (2 Units)
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.

SVG 516: Marine Surveying (2 Units)
Coastal engineering. Situation and erosion. Coastal zone Management. Demarcation of Harbours, habour laws. Position Fixing. Large scale surveys Dredging. Effects of wind and wave on sea bed. Oceanographic equipment. Tidal current Measurement.

SVG 517: Cadastral Surveying IV (2 Units)
Professional Practice. Professional body. Control of the profession. Code of ethics. Costing of Cadastral, topographical Engineering and Hydrographic Surveys. Costing of mapping projects.

SVG 518: Computational Photogrammetry (2 Units)
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.

SVG 519: Electronic Surveying II (2 Units)
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.

SVG 531: Research Method II (2 Units)
A Review of methodologies in Land Survey/Geoinformatics. 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.

SVG 521: Project Dissertation (6 Units)
Articulate all aspect of Survey and Geoinformatics that is of interest. Know how to procure, analyse and document data. Produce a standards report on the project explaining the theoretical and practical processes gone through.

SVG 522: Satellite Geodesy (2 Units)
The geometrical and dynamical applications of artificial satellites to position and earth's figure and gravity field determination.

List of Departmental Staff
The Departmental of Surveying and Geoinformatics staff comprises Teaching Staff, Academic Advisers, and Non-Teaching (Administrative) Staff. The following tables present their details, including names, disciplines, qualifications, ranks/designations, areas of specialization, and other relevant information.

Table L1: Academic (Teaching Staff) List

S/N	Name	Qualifications	Area of Specialization	Professional Certification	Rank	Employment Status
1	M. N. Ono	B.Sc. (UNIBEN, Benin), M.Sc. (ABU, Zaria), Ph.D. (UNN, Nsukka).	Geodesy and Geodynamics	SURCON	Professor	Full-Time (Sabbatical)
2	J. O. Mogborukor	PhD (AAU, Ekpoma), MSc. (DELSU, Abraka), BSc. (DELSU, Abraka)	Regional Development and Land Use Planning		Professor	Full-Time
3	K. E. Idhoko	B.Tech. (FUTA, Akure), PGD (FSS, Oyo), PGD (UNIZIK, Awka), M.Sc. (UNIZIK, Awka), Ph.D. (UNIZIK, Awka).	GIS and Remote Sensing	SURCON	Senior Lecturer	Full-Time (Sabbatical)
4	S. O. Edeki	BSc. (DELSU, Abraka) MSc. (UI, Ibadan) Ph.D (CU, Ota)	Financial Mathematics/ Fractional Calculus		Senior Lecturer	Full-Time
5	S. O. Eteje	HND (AUCHIPOLY, Auchi), PGD (UNIZIK, Awka) M.Sc. (UNIZIK, Awka), Ph.D. (UNIZIK, Awka).	Geodesy and Geodynamics	SURCON	Senior Lecturer	Full-Time
6	C. C. Ifuwe	B.Sc. (UNN, Nsukka), M.Sc. (UNN, Nsukka), Ph.D. (FUPRE, Warri).	Geoinformatics	SURCON	Lecturer I	Full-Time
7	M. O. Ashikodi	PhD (UNIBEN, Benin), MSc. (UNIBEN, Benin), BSc. (UNIBEN, Benin).	Environmental Management and Assessment		Lecturer II	Full-Time
8	A. C. Oburo	B.Sc. (UNIZIK, Awka), M.Sc. (UNIZIK, Awka).	GIS and Remote Sensing	SURCON	Lecturer II	Full-Time
9	F. C. Dibosa	MSc. (UNIBEN, Benin), BSc. (UNIJOS, Jos)	Geomorphology and Environmental Management		Lecturer II	Full-Time

Table L2: Academic Level Advisers

Level	Names of Advisers	Qualifications
100	A. C. Oburo	B.Sc. (UNIZIK, Awka), M.Sc. (UNIZIK, Awka).
200	A. C. Oburo	B.Sc. (UNIZIK, Awka), M.Sc. (UNIZIK, Awka).
300	C. C. Ifuwe	B.Sc. (UNN, Nsukka), M.Sc. (UNN, Nsukka), Ph.D. (FUPRE, Warri).
400	S. O. Eteje	HND (AUCHIPOLY, Auchi), PGD (UNIZIK, Awka) M.Sc. (UNIZIK, Awka), Ph.D. (UNIZIK, Awka).

Table L3: Laboratory Staff List

S/N	Name of Technical Staff	Name of workspace	Rank	Qualifications, Dates Obtained Membership of Professional Association	Duties Performed/Courses Taught
1	Mr. Collins Ojoh	GIS Laboratory	Senior Lab Technologist	B.Sc. Geography and Regional Planning (DELSU, Abraka, 2008), M.Sc. Geography/Climatology (DELSU, Abraka, 2011),	Taking the students GIS practicals
2	Surv. Inene Fidelis John	Field Practicals	Technologist I	HND, Surveying and Geoinformatics (2013); PGD Surveying and Geoinformatics (2019); SURCON, Member, Nigerian Institution of Surveyors (NIS), 2024	Instructor, Field Practicals such as: Topographic Survey, Perimeter Survey, Route Surveys, Detail Survey, Compass Surveying, Chain Survey.

Table L4: Non-Teaching Staff (Administrative)

S/N	Name of Staff	Qualification and Dates Obtained	Area of Specialization	Rank	Employment Status
1	Mrs. Ijeh-Isiekwene Obiageli Perpetual	B.Sc. (Geography and Meteorology), UNIZIK, 2012.	Geography and Meteorology	Administrative Officer	Full-time
2	Mrs. Nwalor. C. Canicemary	B.Sc. (Mass Communication), CARITAS ,2010	Mass Communication	Administrative Officer II	Full-time
3	Miss Imire Lucille Dumebi	B.A. (Philosophy), A.A.U (2019)	Philosophy	Administrative Officer II	Full-time