

ELIZADE UNIVERSITY

ILARA-MOKIN, ONDO STATE



**DEPARTMENT OF CIVIL
ENGINEERING**

Handbook for Undergraduate Programme

Department of Civil Engineering, Elizade
University, Ilara-Mokin, Ondo State,
Nigeria

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Ilara-Mokin, Ondo State, Nigeria

HEAD OF DEPARTMENT

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Note: The Information contained in this handbook is accurate and up-to-date at the time of publication. However, the matters covered are subject to change from time to time. The Department will publish such changes, if there are any, in the next edition of the handbook.



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Preface

This Departmental Handbook provides information to prospective and registered students about the programme of studies offered by the Department of Civil Engineering, Elizade University, Ilara – Mokin, Ondo State, Nigeria. It is hoped that the information would assist students derive maximum benefits from the opportunities and facilities available in the Department and the University in planning their academic programmes.

The currently available five-year engineering degree programme is built on a common foundation of basic studies, comprising Mathematics, Basic Sciences, Engineering Sciences and General Studies. The programme is designed to facilitate specialization, while offering opportunities for taking approved courses in other areas. The programme is also fashioned to allow the prospective graduate engineer to have appropriate technical expertise and human perspective.

The Department of Civil Engineering, Elizade University, Ilara – Mokin, Ondo State, Nigeria issues this Handbook as a general guide to its courses and facilities. It forms no part of a contract. The Department reserves the right to modify or alter without prior notice any of the contents herein.

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PRINCIPAL OFFICERS OF THE UNIVERSITY

VISITOR/FOUNDER

Chief Michael Ade.Ojo, OON

B.A. (UNN.)

CHAIRMAN, BOARD OF TRUSTEES

Chief Michael Ade.Ojo, OON

B.A. (UNN.)

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LL.B (Ife), LL.M (Pennsylvania)

PRO-CHANCELLOR AND CHAIRMAN OF COUNCIL

Professor Femi Bamiro, CON

B.Eng. (Nottingham), Ph.D (McGill)

VICE-CHANCELLOR

Distinguished Prof. Kayode Thadius Ijadunola

MBChB. (Ile-Ife), MSc. (Ile-Ife), FWACP, MD

REGISTRAR

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B.A. (Ado), MCA (Ibadan), PGD (Lagos)

UNIVERSITY BURSAR

Mr. Samuel Ajeigbe

FCA, MBA, ACTI

UNIVERSITY LIBRARIAN

Dr. Ugwunwa Chinyere ESSE

B.Sc. (Ibadan), M.Info.Sc (Ibadan), PhD.

The University's Mission

To produce graduates with the appropriate skills and knowledge for the development of the nation and global competitiveness.

The University's Vision

Elizade University seeks to be a globally competitive institution that produces entrepreneurial, innovative and ethical graduates.

The University's Strategic Objectives

The strategic objectives of the University (Elizade University, Ilara- Mokin) are to:

- a. produce graduates of international standard, with appropriate knowledge and skills in their field of study, who will be highly employable and to employ themselves;
- b. provide high quality research and development activities that will promote the development of the Nation and enhance the image of the University and the researchers;

- c. harness modern technology especially ICT and modern social, economic and financial strategies to run a cost of efficient and effective academic programme and institutional management;
- d. provide services that have relevance to and impact on the local community and the Nation;
- e. provide conditions of study, work and living in the University Community that are of appropriate standard;
- f. expand access to tertiary education in the face of unmet demand; and
- g. operate as an equal opportunity educational institution, sensitive to the principle of gender equity and non-discriminatory based on race, ethnicity, religion or physical disability.

Roll of Honours for Students

Senate decided that Roll of Honours for Students be instituted in the University to enhance discipline and good performance among students. All students are enjoined to strive to be on the Honours Roll.

The Details of the honours roll are as follows:

The Honours Roll should be at three levels as follows:

- a. Founder list: for suitably qualified candidate with a minimum CGPA of 4.75 on 5-point grade
- b. VC list: for suitably qualified candidate with a minimum CGPA of 4.50-4.74 on 5-point grade, and
- c. Dean's list: for suitably qualified candidate with a minimum CGPA of 4.29-4.49 on 5-point grade

The beneficiaries must have a minimum CGPA of 4.0 out of 5.00 and the beneficiary must maintain this grade annually to continue to enjoy the award. The recommendations must be processed along with results of second Semester Examinations. Student must be of good conduct. He or she must not have outstanding or carry-over courses and must not be repeating the year. No student on Leave of Absence shall enjoy the Annual Roll of Honours Award. No student that has a disciplinary problem shall enjoy the award. The award shall be based on the recommendation of the Department Board of Examiners and the Faculty Board of Examiners. Each beneficiary shall be given a certificate and scholarship.

Department of Students' Affairs

Information on students' welfare can be summarized as follows:

- a. Guidance and Counselling Unit:** The Division of Student Affairs has Professional Counsellors who are committed to helping students grow in self-understanding in the Process of integrating their personal and academic experiences. The Services are free to students and are confidential (not used as part of his/her other University records). The services include personal counselling, group counselling, study skills improvement, tests anxiety reduction, personal crisis intervention, psychological testing, career and occupational counselling and settlement of grievances between students, where necessary, consultations are made with campus organizations, sound academic Departments, to ensure that students' problems are resolved satisfactorily. The Counsellors can be contacted on the ground floor of the Senate Building;
- b. Scholarship and Financial Assistance:** The Division of Students' Affairs serves as a link between students and Sponsoring authorities, both within and outside Nigeria. Students are to check the Notice Boards in their respective faculties as well as those at the Division of Student Affairs Building for advertisements and other relevant information. Liaison is also maintained between

students and governments at various levels for scholarship and bursaries.

Information on the University Library

Membership of the Library is available, on completion of a registration card, to all students, members of the senior staff of the University and such other persons as may be determined by the Library Committee or the University Librarian on behalf of it. Students are required to renew their registration at the beginning of each academic year. Library Cards and Borrower's Tickets are not transferable; books issued on them remain the responsibility of the person whose name appears on them. A Lost Library Card or Borrower's Ticket may be replaced on submission of a written application.

History and Location of the University and the Programme

The Elizade University is located in Ilara-Mokin in Ondo State of Nigeria. Ondo State, Nigeria in which was created on 3 February 1976 from the former Western State. It originally included what is now Ekiti State, which was split off in 1996. Akure is the State capital. The State lies between Longitudes 4° 30' and 6' East of the Greenwich Meridian, 5° 45' and 8° 15' North of the Equator. This means that the State lies' entirely in the tropics. Ondo State is bounded in the North by Ekiti and Kogi States; in the East by Edo State; in the West by Oyo and

Ogun States; and in the South by the Atlantic Ocean. The State has a land area of 14,788.723 Square Kilometres. The State has a population of 3,441,024 comprising 1,761,263 males and 1,679,761 females.

Having completed all due processes, approval for the establishment of the Elizade University was given by the Federal Government on 22 February 2012. The approval was conveyed through the Provisional Licence to Operate as a Private University No. 46 dated 28 February 2012 issued by the National Universities Commission. The Elizade University aims to attract the best and the brightest students in Nigeria and beyond. The main aim is to provide them with practical-oriented scientific, technological and arts education which shall make them self-reliant while preparing them for future leadership and success in their chosen careers in the highly competitive new knowledge society. Academic session of the Elizade University started at 2012/ 2013 session (6th January 2013). The Engineering Faculty started at the Elizade University during 2013 / 2014 academic session.

The Department of Civil and Environmental Engineering started with the take-off of the University in 2012 as one of the pioneer departments in the Faculty of Engineering. The Department commenced academic activities at the beginning of

2013/2014 academic session. The total students' enrolment rose from 14 in the first year to the current figure of 63 students' enrolment on its Bachelor of Engineering (Civil and Environmental Engineering programme).

TEACHING STAFF

S/N	NAME	DESIGNATION	QUALIFICATION	PROFESSIONAL QUALIFICATION	AREA OF SPECIALIZATION
1	Engr. Dr. A. O. Akinro	Senior Lecturer	B.Eng. M. Eng, Ph.D	MNSE, COREN Registered	Soil and Water Engineering
2	Engr. Prof. P. Oguntunde	Professor	B. Eng, M.Eng, Ph. D	MNSE, COREN Registered	Environmental Hydrology and Water Engineering
3	Engr. Dr. O.K. Akinmusere	Lecturer I	B. Tech, M.Sc, Ph. D	MNSE, COREN Registered	Water Resources and Environmental Engineering
4	Engr. Dr. C. S. Ezemenike	Senior Lecturer (Adjunct)	B. Eng. M. Sc. Ph.D	MNSE, COREN Registered	Highway / Transportation Engineering
5	Engr. E. O. Fakorede	Lecturer I	B. Eng, M. Eng	MNSE, COREN Registered	Water Resources/ Environmental Engineering
6	Engr. J.A. Ajayi	Lecturer II	M. Eng	MNSE, COREN Registered	Structural Engineering
7	Mr. R. Ikumawoyi	Asst. Assistant	B. Eng, M. Eng		Highway / Transportation Engineering
8	Mr. C. G. Williams	Asst. Lecturer	B.Eng, M.Eng	MNSE	Geotechnical Engineering
9	Engr. O. S. Yakubu	Asst. Assistant	B. Eng	COREN Registered	Structural Engineering
10	Engr. A. O. Fasuba	Asst. Assistant	B. Eng	MNSE, COREN Registered	Structural Engineering

NON-TEACHING STAFF

Technical and Supporting Staff Members

1. Technical Staff

S/N	NAME OF STAFF	RANK	QUALIFICATIONS	NO. OF LABORATORY	NAME OF WORK/LABORATORY
1	Engr.Tech. K. S. Ayegbo	Technologist I	HND	1	Soil Mech/Geotechnical/ Water Engineering/ Fluid Mechanics
2	Mr. Lawal Temitope	Technologist I	HND	1	Survey or Photogrammetric/Structures/Highway
3	Engr. Lasisi Kabir	Principal Technologist	HND	1	Fundamental of Electrical Engr. Lab
4	Dr. Olanrewaju Stephen	Chief Technologist	M. Eng, Ph.D	1	Workshop practice lab
5	Engr. Ileoye S.	Technologist I	PGD, HND	1	Applied Mechanic lab

ADMINISTRATIVE STAFF

Name of Staff	Rank/Designation	Qualification and Dates Obtained	Duties
Mrs. Hellen IBO	Senior Confidential Secretary.	HND Secretarial Studies (Ekiti, 2009)	General secretarial duties and other administrative assignments assigned by the Head of Department
Mrs. Ebunoluwa Babayemi-Amuleya	Clerical Officer	NCE, English/Yoruba (Ikere-Ekiti, 2006).	General clerical duties

The Course Unit System and Computation of Cumulative Grade Point Average [CGPA].

The course units in the Department are organized on the course credit system per semester. A semester lasts for approximately 17 weeks, including the periods of registration and examinations provided that not less than 14 weeks are devoted to actual teaching. One credit unit is the equivalent of 15 contact hours of classroom teaching or 30 hours of laboratory work. Most of the course units in the Department carry the weight of 3 or 2 credit units, suggesting that they are taught for 45 or 30 hours in the semester or 3 or 2 one-hour periods per week. In courses with strong practical component, this means that there are 15 hours of teaching and 45 hours of practicals to qualify for 2 credit units or 30 hours of teaching and 45 hours of practical for 3 credit unit courses. However, there are fewer 3 credit unit courses which suggest that more work is required to be done in 45 contact hours per semester or the equivalent in terms of practical and classroom teaching. At the end of each semester, a final examination is given to bring the course to final conclusion. The final examination in each course unit is weighted 60% of the component, usually 2 per course unit, carries the weight of 40% of total marks for the course. No student can pass in a course unit if he/she fails to submit the continuous assignment (CA) assignments.

Pattern of Examination

Each course shall be examined at the end of the semester. The examination shall be conducted as prescribed by Senate. Each examination shall be 1-3 hours in duration. In addition, there may be a practical paper and/or an oral examination. There shall be continuous assessment for each course and this shall constitute a percentage of the formal grade.

Measurement of Performance

Performance in a course shall be measured in terms of:

- a. The results of prescribed theory and practical examination;
- b. Continuous assessment which shall constitute 40% of measured performance; and
- c. Assessment of such essay, practical exercises and reports prescribed for each course.

Level of Performance

A student shall be recorded as having attained in a course a level of achievement graded as follows:

Level of Performance	Rating	Credit Points Per Unit
A	70% - 100%	5 (Excellent)
B	60% - 69%	4 (Very Good)
C	50% - 59%	3 (Good)
D	45% - 49%	2 (Adequate)
F	0% - 44%	0 (Failure)

Calculation of Grade Point Average [GPA]

The overall performance of each candidate during an entire semester shall be determined by means of a weighted grade point average, obtained by awarding credit points in respect of each course multiplied by the numeral value of the grade obtained as follows:

Level of Performance	Rating	Credit Points Per Unit
A	70% - 100%	5
B	60% - 69%	4
C	50% - 59%	3
D	45% - 49%	2
F	44% - 40%	0

Definition of Term.

- a. **Student Workload:** This is defined in terms of course units. One unit represents one hour of lecture or one hour of Tutorial or 2-4 hours of practical work per week throughout a semester. Thus for example, a course in which there are 2 hours of lectures and 1hour of Tutorial per week is a 3 unit course.
- b. **Total Number of Units (TNU):** This is the total number of course units carried by a student in a particular semester. It is the summation of the load Units on all courses carried during the semester. For example, A student who is carrying 6 courses of 3 units each has a TNU of 18 for that semester. No student shall be allowed to carry (i.e. register for) or be examined in more than 24 units in any particular semester.

- c. Cumulative Number of Units (CNU):** This is the summation of total number of Units over all the semesters from the beginning to date. A student who is prone to repeating courses will finish (if he does not drop out) with a higher CNU than his non-repeating colleagues and will most likely require a longer time to complete requirements for the award of Degrees.
- d. Level of Performance Rating:** This is the rating of grades obtained in terms of Credit points per load unit. The rating used is as follows:

Level of Performance	Rating	Credit Points Per Unit
A	70% - 100%	5
B	60% - 69%	4
C	50% - 59%	3
D	45% - 49%	2
F	44% - 40%	0

Based on the above, a student who obtained a grade of "A" in a 4-unit course has scored 20 Credit points, and one who obtained a grade of C in that course has scored 12 Credit points.

- e. Total Credit Point (TCP):** This is the sum of the products of the course units and rating in each course, for the entire semester period. For example, consider a student who took 4 courses of 5 units each. Let's say the grade obtained in the four courses were C.B.E.D. respectively. The TCP of this student is obtained as $5 \times 3 + 5 \times 4 + 5 \times 0 + 5 \times 2 = 45$
- f. Cumulative Credit Point (CCP):** This is the summation of Total Credit Points over all semesters from beginning to date.
- g. Grade Point Average (GPA):** This is the total credit points (TCP) divided by the total units (TNU). For example, consider the student's scores referred to above. His TCP is 45, and of course, his TNU is 20 (4 courses at 5 units each, for the semester). The highest GPA that can be earned is 5.0 and that is when a student has earned a grade of "A" in every course during the semester. The lowest GPA obtainable is 0.0 and this would happen if the student has F all round during the semester
- h. Cumulative Grade Point Average (CGPA):** This is the summation of TCPs for all semesters, divided by the summation of TNU s for the said semesters. Like the GPA, CGPA obtained ranges from 0 to 5.

GPA and CGPA Sample Computations

Sample Computations: Consider a student who has enrolled for his/her 100level courses, and has just completed 2 full semesters in the University, His/her GPA and CGPA could be computed as follows (Tables 1 & 2).

Table 1: Example of CGPA Computation for First Semester

100-LEVEL: 1ST SEMESTER										
Course Code	Course Title	Units	Lecture	Tutorial	Practical	Examination Score	Rating	CP	TCP	TNU
GST 101	Use of English I	2	1	1	-	75 (A)	5	10	10	2
GST 103	Use of Library and Information Literacy	1	1	-	-	35 (F)	0	0	10	3
GST 105	Citizenship and Leadership Education	1	2	-	-	60 (B)	4	4	14	4
MTH 101	General Mathematics I	3	2	1	-	87 (A)	5	15	29	7
MTH 103	General Mathematics III	3	2	1	-	67 (B)	4	12	41	10
PHY 101	General Physics I	3	2	-	3	78 (A)	5	15	56	13
CHM 101	General Chemistry I	3	2	1	-	45 (D)	2	6	62	16
CSC 101	Introduction to Computer Science I	3	2	-	3	88 (A)	5	15	77	19
						Previous		Current		
						GPA	0	GPA	4.05	
						CGPA	0	CGPA	4.05	

Table 2: Example of CGPA Computation for Second Semester

100-LEVEL: 2ND SEMESTER										
Course Code	Course Title	Units	Lecture	Tutorial	Practical	Examination Score	Rating	CP	TCP	TNU
GST 102	Use of English II	2	1	1	-	75 (A)	5	10	10	2
GST 104	History And Philosophy of Science and Technology	1	1	-	-	75 (A)	5	5	15	3
GST 106	Philosophy and Logic	2	2	-	-	60 (B)	4	8	23	5
MTH 102	General Mathematics II (Calculus)	3	2	1	-	87 (A)	5	15	38	8
PHY 102	General Physics II	3	2	1	-	88 (A)	5	15	53	11
CHM 102	General Chemistry I	3	2	1	-	67 (B)	4	12	65	14
PHY 106	Properties of Matter	1	1	-	-			0	65	15
CSC 102	Introduction to Computer Science II	3	2	-	3	78 (A)	5	15	80	18
GNE 102	Engineer –in– Society	1	1	-	-	45 (D)	2	2	82	19
						Previous		Current		
	Total	19				GPA	4.05	GPA	4.32	
						CGPA	4.05	CGPA	4.18	

Transfer within the University and Length of Stay in the University

For a student to qualify for a degree, a candidate will normally be required to spend a minimum of three academic years at the Elizade University. If a student transfers from one Faculty to another, the transfer would be treated as if he/she is just being admitted into the University since as part of the requirement for graduation the student has to take all the foundation/compulsory courses in the new Faculty or Department. In that case his/her stay in the new Faculty or Department should be 1.5 times the number of semesters required to complete a programme. Where student transfers from a science based Faculty to another, the computation of his result in the new Faculty shall take cognizance of his previous CGPA in the new Department. The duration of the stay in the University will be what remains of the 1.5 times the number of semesters required to complete the programme as approved by Senate.

Where a student is transferring from an engineering or a science-based to a Humanities, Arts-based Faculty or vice-versa, the transfer should be treated as if the student is just being admitted into the University. The GPA of the student will not be transferred to the new Department. He or She will however be required to take all the foundation or compulsory courses in the new Department.

Release of Examination Results

- a. At the end of each semester, a provisional list of successful candidates in course examination shall be published by the Chief Examiner soon after the ratification of the recommendation of the Board of Examiners by the Faculty Board.
- b. The proceedings of Boards of Examiners are confidential and are in no circumstances to be disclosed at any time to any candidate or to any other unauthorized person.
- c. However, without prejudice to Regulation (b) above, a student contesting a given grade after the release of results can appeal to the Vice-Chancellor, who shall cause the Head of Department to call for the affected paper of the candidate for re-marking. This shall be done after payment of the prescribed fee.
- d. The final results of candidates for the award of a degree shall be published by the Registrar after they have been approved by Senate.

Withdrawal from the University

Students are considered withdrawn from the University when their case falls under any of the followings:

- a. Termination of Studentship:** A student that fails to register for courses in two consecutive semesters are credited with 2 Number of Registration Information (NRI) and subsequently withdrawn from the University.
- b. Poor Academic Performance:** Student is considered to have automatically withdrawn from the university if he/she scores a Cumulative Grade Point Average [CGPA] that is less than one in two consecutive semesters.
- c. Voluntary Withdrawal:** A student is also considered withdrawn when his/her application for voluntary withdrawal has been processed through all the statutorily meetings for such a case.
- d. Gross Misconduct:** A student can also be considered for withdrawal through expulsion from the University when found guilty of a gross misconduct by the University Administration. Offences leading to such misconduct includes: examination malpractice disobedience to the University Authority through one of several misdemeanours

Final Assessment and Classification

Final assessment of the student can be summarized as follows:

- a. A student's workload is defined in terms of course units. One unit represents one hour of lecture or one hour of tutorial, or 24 hours of practical work per week throughout a semester. All courses shall run for one semester or a full session of two semesters.
- b. The final award and the class of the degree shall be based on the Cumulative Grade Point Average [CGPA] obtained by each candidate in all prescribed courses approved by the University. The final cumulative grade point average shall be calculated-on the basis of the total number of credit points and the total number of course units registered for during the course of the student's programme. In the case of a failed course, the candidate must repeat the course at the next available opportunity. If the course is an elective, the candidate may substitute another course which is an elective, and shall not be required to pass the failed elective course. If the course is a restricted elective, substitution can only be made from the list of restricted electives. The failed grade would however be reflected in the transcript.
- c. A candidate who scores a cumulative grade point average [CGPA] of less than 1.00 in two consecutive semesters shall be required to withdraw from the University

- d. A candidate who has satisfactorily completed all requirements for the degree with an overall grade point average of not less than 1.50 shall be awarded the honours degree as indicated as follows:

I.	First Class	4.50 - 5.00
II.	Second Class (Upper Division)	3.50 - 4.49
III.	Second Class (Lower Division)	2.40 - 3.49
IV.	Third Class Honours	1.50 - 2.39
V.	Pass	1.00 - 1.49

Passes in required units of special electives is a requirement for graduation.

Student Registration on E-Portal

Visit the university URL directly with <https://my.elizadeuniversity.edu.ng/> Follow the instruction. Pay the school fees and registered all the necessary courses from course list for the programme through my Elizade.

Academic Regulations (Rules and Regulations Governing the Conduct of Examinations)

Eligibility

All students who are registered for courses in a given semester are eligible to sit for examination in those courses EXCEPT for students in the following categories:

- a. A student who fails to attend up to 75% of lectures or practical in any course.
- b. A student who is absent from the University for one (1) semester without official notification" and permission. Such a student is deemed by Senate to have withdrawn from the University.

The implementation of cases listed above is normally subject to Senate approval on the recommendation of the Faculty Board.

Examination Instructions to Students

Every student shall:

- a.
 - i. be admitted into the Examination Hall only on the production of the University Identity Card, and/or Examination Card;
 - ii. ensure that he/she acquaints himself/herself with and adhere strictly to the instructions governing examinations in the University including those printed on the front cover of the answer booklets.
 - iii. have the full responsibility of ensuring, before the commencement of any examination or test that nothing incriminating is found in his/her possession or on materials he/she legitimately brought into the examination hall, e.g rulers, four figure tables, etc. to aid his/ her performance in the Examination
 - iv. conduct himself or herself in an orderly manner and obey all instructions of the invigilator/examiner.
 - v. not to be engaged in or attempt any manner of examination malpractice.
- b. Students are not expected in the vicinity of the examination hall earlier than 30 minutes before the commencement of each examination. They are also required to keep strictly to the sitting arrangements. No candidate should, under any circumstances remove chairs arranged in halls used for examination purposes.
- c. Students must report at the examination venues punctually at the time schedule for their papers. Students arriving later than half an hour for an examination may be refused entry into the examination hall.
- d. Students must bring with them to the examination hall, their writing materials which may be permitted by these regulations (as stated here under). They are however not allowed to bring any books or papers except those that may be permitted or provided by the Department responsible for the examination being held. Students are warned in their own interest to ensure that lecture notes, textbooks, jotters, bags or any other unauthorized materials or aids etc. are not brought into the examination hall
- e. The invigilator may search students before they are allowed into the examination hall

- f. To ensure orderliness in the examination hall, seats will be arranged accordingly at each particular time.
- g. Students are NOT ALLOWED to be in possession of any radio and audio equipment or mobile phone in the examination hall. While any examination is in progress, no handset should therefore be found on any student.
- h. Communication of any kind between candidates is strictly forbidden during examination. Any student found to be giving or receiving irregular assistance shall face disciplinary action
- i. Silence must be observed in the examination hall. The only permissible way of attracting the attention of the invigilator is for the student to raise his/her hand.
- j. The use of scrap paper is not permitted. Rough work must be inside the answer booklets, crossed neatly and boldly written "ROUGH WORK" before submission of the answer script.
- k. Students offering mathematics or courses requiring technical instruments must bring their own mathematical or drawing instruments
- l. Personal copies of Mathematical Tables will not be allowed In examination halls (see regulation on the use of calculators).
- m. Students must use their matriculation numbers for the examination and not names.
- n. Before handing in their answer scripts at the end of the examination, students must satisfy themselves that they have inserted, at the appropriate places, their Matriculation Numbers and the number of the question answered. Except for the question papers and any other materials they may have legitimately brought with them (as indicated above), students are not allowed to remove or mutilate any paper or materials supplied by the University.
- o. Students shall not normally be permitted to leave the examination hall during the first 30 minutes of any examination.
- p. At the end of an examination, students must remain seated while invigilators go from row to row to collect answer scripts.
- q. Students are required to sign against their matriculation numbers on the attendance register during the examination.

Invigilation of Examinations

- a. Invigilators shall normally allow the students into the hall ten minutes before the commencement of the examination and to sit in an orderly manner. Blank answer sheets and other necessary required materials shall then be distributed.
- b. Students shall not commence writing at the start of an examination session until authorised to do so by the invigilator. Students shall stop writing at the end of an examination session when similarly instructed.
- c. About five minutes before commencement of the examination, the packet of question paper shall be opened and the papers distributed with face downwards, while students are warned not to start until they are told to do so.
- d. At the scheduled time for the commencement of the examination and after the distribution of papers has ended, the invigilator shall ask the students to start and note the "exact time of commencement," and the exact time to end the examinations, depending on the periods of time allowed for the examinations.
- e. Invigilators shall pass round the students' attendance register corresponding to the examined course for the students to fill and sign during the examination.
- f. Invigilators shall familiarize themselves with instructions to students and enforce the rules and regulations contained in these instructions.
- g. During the examination, invigilators shall, exercise constant and vigilant supervision over the, students.
- h. In any case of examination misconduct by students, the Chief Invigilator shall require the student(s) concerned to write and fill the irregularity form, and allow the student(s) to proceed with the examination. The Chief Invigilator shall report such cases to the Faculty Dean, the Head of Department and the Chief Examiner concerned within 24 hours.
- i. Invigilators shall ensure that students bring only authorized materials into the examination hall. Bags, books and other students' property must be left outside the examination hall. For this purpose, invigilators shall inspect the hall after students have been seated before the commencement of each examination.
- j. No student may leave the examination hall during the first half hour of an examination except to go to the toilet or the first-aid room and must be accompanied by an attendant/invigilator of the same gender.

- k. Normally, no student shall be admitted after the first half-hour of the examination and no question paper, shall be removed from the hall before the first half-hour of the examination has lapsed.
- l. If any student shall have finished his/her paper before the time required, the Chief Invigilator at his/her discretion allow the student to submit his/her answer booklet and retire, otherwise, students may not normally leave the examination hall during the first and last half-hour.
- m. Invigilators shall ensure that silence is maintained in the examination hall. The only permissible way of attracting the attention of the invigilator is by the student raising his/her hand.
- n. Invigilators must inform students of the time, 30 minutes and five minutes before the close of the examination.
- o. At the close of each examination, invigilators shall go round to collect from students, their answer booklets/scripts and check them against the attendance register.
- p. Students are required to dress decently and not in a manner that is likely to create a disturbance in the examination hall or to distract the attention of other students.
- q. No student shall take into examination hall or have in his/her possession during an examination any book or paper relevant to the examination unless specifically authorised. The invigilator/ examiner has authority to confiscate such document.
- r. Students attending a practical examination must comply with the safety requirement of the laboratory in which their examination is held.
- s. No students shall take into the examination hall any electronic calculator or other means of data storage or retrieval unless specifically authorised. When specified, an electronic calculator must be approved for the University examinations.
- t. The invigilator shall enclose the collected answer booklets/scripts and the corresponding attendance registers in the special envelopes provided by the Chief Examiner.
- u. The Chief Invigilator shall sign and seal-the envelopes and 'submit them to the Chief Examiner concerned.

The Use of Calculators and Other Electronic Devices

- a. For examinations in certain courses, the use of electronic calculator is permitted but the calculator must be non-programmable. Only one calculator shall be allowed per student. Organizers are not permitted.

- b. The calculator must be small (hand-held), and battery-operated.
- c. A student must not borrow another student's calculator during an examination.
- d. The responsibility for correct operation of the calculator rests with the student alone.
- e. Instruction manuals, calculator packets and containers are forbidden in the examination halls. Invigilators and Examination Assistants shall confiscate them whenever and wherever they are discovered in the examination halls.
- f. The calculator must be switched off on entry into the examination room and can only be turned on when ready to be used.
- g. Student shall declare their calculators and make them available for inspection by invigilators on entry into the examination hall.
- h. Contravention of any of these regulations shall constitute examination malpractice or misconduct and shall so be treated.
- i. Student should not bring phone to the examination room

Absence from Examination

- a. All students must present themselves at all University Examinations for which they have registered under these regulations. Students who fail to do so for reasons other than illness or accident or other exceptional causes shall be deemed to have failed that examination.
- b. Misreading of the time table and such lapses on the part of the students shall not normally be accepted as satisfactory explanation for absence.
- c. A student who falls ill during an examination period should report in writing to the Dean of his/her Faculty through his/her Head of Department with a report from the University's Director of Medical Services.
- d. A student who is absent from an examination on account of illness confirmed by the medical evidence from the University Medical Centre may seek the permission of Senate to make up the examination at the next available opportunity without penalty. Approval for the make-up examination shall be given by Senate on the recommendation of Faculty Board.

Examination Misconduct and Malpractices

Types of Examination Malpractices: Types of examination malpractice which are by no means exhaustive include:

- a. Possession of question papers before examination/test or attempt to do so.
- b. Swapping or attempt thereof of answers before, during or after examination/test.
- c. Bringing into the examination hall, any unauthorized pieces of paper.
- d. Tattooing: inscription of answers, hints or codes thereof on any part of the student's body/dress, or in any other manner whatsoever.
- e. Passing information from one student to another in the examination hall.
- f. Seeking or soliciting any assistance whatsoever from any other student or any other unauthorized person in the examination hall.
- g. Any disorderly conduct before or during any examination or test.
- h. Pre-arranged sitting pattern by any student or group of students in the examination hall with a view to facilitating unauthorized exchange of information.
- i. Impersonation-one candidate arranging with another person to write an examination on his/her behalf.
- j. Unauthorized possession of the University answers booklets or attempt thereof.
- k. Assaulting/manhandling invigilators and/or attendant.
- l. Any action or inaction of any student in and around the examination hall which is inimical to or subversive of the integrity of the University examination process, such as the offences listed above, shall constitute examination misconduct.
- m. Offering information/assistance and accepting information/ assistance from another student during examination is a breach of examination regulation and both carry equal punishment.
- n. Students are not allowed to use unfair means in any University examination: unfair means shall include plagiarism- which means submitting a work that is part or fully from the work of another without due acknowledgement.
- o. Any other irresponsible act not listed above but that from time to time be considered to jeopardize the essence of a good examination by the University Authority.

Procedure for Handling Cases of Examination Misconduct

Examination misconduct shall continue to be processed by the Student Disciplinary Committee (SDC).

- a. In any case of examination misconduct by student(s), the Chief Invigilator shall require the student(s) concerned to write and fill the irregularity form and allow the student(s) to proceed with the examination.
- b. The Chief Invigilator shall write his own statement and report the case(s) of examination misconduct to the Chief Examiner who is also the Head of Department concerned for onward transmission to the Faculty Dean for necessary action(s).
- c. On receiving the report, the Faculty Dean shall set up a Faculty Committee of 3 members to investigate the case; the report of this Committee shall be forwarded to the Vice-Chancellor.

Procedure for Investigating Examination Misconduct Alleged

- a. Failure to observe any of the examination rules of conduct or any breach thereof shall prima-facie constitute examination malpractice or misconduct generally.
- b. At the discretion of the Chief Invigilator, a student may be asked to leave the examination hall when his/her conduct is judged to be disturbing or likely to disturb the examination. The Chief Invigilator shall submit a written report on any such action to the Head of Department and Dean of his/her Faculty at the end of the examination.
- c. Any student suspected of any examination irregularities shall be required to submit to the Chief Invigilator, a written statement immediately after the paper. Failure to make a written statement shall be regarded as an admission of the allegations against him/ her and may also be charged for insubordination. Reports from invigilators shall always-be through the Chief invigilators.

Programme Philosophy

In consonance with the national goals and objectives of industrialisation and self-reliance, the undergraduate Civil Engineering programmes are geared towards: early broad-based training in general engineering and technology; the development of a thorough engineering practice after

training; practical application of Civil Engineering skills in meeting the basic human needs; and close association of the programme with engineering industries in the country. Graduates of the Civil Engineering programmes should have acquired high academic standards with adequate practical background, to be of immediate value to industry and the nation in general.

The Civil Engineering programme is structured in such a way that students will have the opportunity to take courses that will provide a basic understanding of all areas of Civil Engineering practice, while they can concentrate in any of the following options in the final year: Structural Engineering, Geotechnical Engineering, Transportation Engineering, and Construction Engineering. Environmental Engineering is that branch of engineering which is concerned with:

- a) The protection of human population from the effects of adverse environmental factors,
- b) The protection of environments both local and global from the potentially deleterious effects of human activities, and
- c) The improvement of environmental quality for man's health and well-being.

It is the systematic application of physical, chemical and biological sciences to protect the environment (air, water and soil). Bordered on one side by the subject of conservation (protection of natural resources) and on the other by medical studies (dealing with the protection of man), it focuses on the change-producing factors in the environment – including the origin, transport, and interaction of pollutants (particulate matter, gases, vapours, liquids, ionizing and non-ionizing radiation, and undesirable organisms) as they relate to the evaluation, treatment and control of the quality of the environment for sustained use by people. Environmental engineering is therefore that discipline of applied science and technology particularly concerned with the relationship of man to his surrounding physical environment and the socio-economic environment in which he is contained. Physical and social sciences are applied to make our environment best suited for man's needs, by solving the problems related to the quality of the environment and the impact of their application on the society, the controlled use and preservation of man's environment.

Civil and Environmental Engineers have several employment opportunities in the public and private sectors of the national economy. These include Federal and State Government Establishments such as the Ministry of Environment, Ministry of Lands and Housing, and River Basin Development Authorities. Opportunities in the private sector include consulting (design)

firms, construction companies, waste management companies, oil exploration, exploitation and servicing companies.

Programme Objectives

The Civil Engineering programme is designed to train engineers that would be capable of analysing, designing, constructing and maintaining physical facilities for the development of the environment. The facilities of interest include structural systems, water supply, wastewater systems and transportation systems. The programme is planned such that its products (graduates) would have been thoroughly trained in structural analysis and structural design, surveying and highway engineering, soil mechanics and foundation engineering, water systems designs (water works, wastewater works, dams and various hydraulic systems). There is of course a set of standard Civil and Environmental Engineering core courses. But in addition to this, the programme is intended to train engineers that would be truly literate. Indeed, this is in the expression of the philosophy of the Faculty of Engineering, Elizade University, Ilara- Mokin. In this connection, the programme includes courses in Applied Electricity and Applied Electricity Laboratory, Civil and Environmental Engineering Report Writing, Industrial Economics, Industrial Law and Management, and so on.

The first two years (after the preliminary year) of the Civil Engineering Curriculum are devoted to studies in mathematics, fundamental engineering courses including Engineering Drawing, Surveying, Thermodynamics, Engineering Mechanics, Workshop Technology and Applied Electricity; as well as a number of more advanced courses such as Strength of Materials, Geology, Materials for Civil Engineering Construction, etc. The remaining two years are devoted to courses in structures, transportation engineering, geotechnical engineering and environmental engineering. Electives are provided in the final year, so that students can opt for additional grounding in structures, transportation, environmental engineering, and geotechnical engineering or, indeed in combinations there from. A great deal of emphasis is laid on linkage with industries especially through the Student Industrial Work Experience Schemes (SIWES). The aim of the industrial training scheme (SIWES), as envisaged by the Department, is to introduce the student to a real life situation of an industrial environment. During the industrial attachment period the student is to appreciate how and why certain decisions (both technical and managerial) are taken under given conditions. He or She is to learn to relate his/her lecture hall knowledge to the

practice in the industry and thereby appreciate the difference between theory and practical implementation. The summary of the objectives of the programmes are to:

- a. develop in the students the ability to use the acquired technical knowledge, sense of analysis, and creative design abilities, in various ways that can contribute to the development of a more satisfying life and environment for the country and for all mankind;
- b. produce leaders, both in creativity and adaptability, in the planning, design, evaluation and analysis of technological innovation for improving the quality of the environment, and of life generally, in response to the ever-changing goals and needs of the Nigerian society;
- c. develop the student's intellectual qualities, technical ability and critical judgement expected in the Engineering profession.
- d. produce graduates that have entrepreneurial skills for self-employment in the Civil Engineering professions; and
- e. lay the foundation on which students can proceed to further studies in specialized aspects of Civil Engineering practice or multi-disciplinary areas involving Civil Engineering.

Degree Offered

B.Eng. (Civil Engineering)

Admission Requirements

A. Unified Tertiary Matriculation Examination (UTME)

Admission to 100 Level is through the UTME of the Joint Admission Matriculation Board Examination in subjects such as English Language, Mathematics, Physics and Chemistry. To be eligible for admission, candidates must have a minimum of five credit pass in the General Certificate of Education (Ordinary Level), or West African Senior Secondary Certificate Examination (WASSCE) or NECO or its equivalent at not more than two (2) sittings in the following subjects: Chemistry, Physics, Mathematics and English Language, others should be either Further mathematics, Technical Drawing, Agricultural Science and Biology.

UTME Subjects: English Language, Chemistry, Mathematics and Physics

B. Direct Entry

In addition to the requirements specified above in (a), candidates seeking admission to 200 Level must possess

- i. National Diploma (ND) at Upper Credit Level or equivalent in Civil Engineering or related discipline from recognised institutions, or
- ii. Good passes (minimum of C grade) at the General Certificate of Education (Advanced Level) or its equivalent in Chemistry, Physics and Mathematics.

Programme Duration

The normal duration of the academic programme is five academic sessions for students admitted to 100 - level through the UTME and four academic sessions for those admitted into 200 - level by Direct Entry. Students that fail to graduate at the end of normal academic sessions shall not be allowed to exceed a total of 15 semesters in the case of UTME students and 13 semesters in the case of Direct Entry students.

Graduation Requirements

To be eligible for a degree of B.Eng. in Civil Engineering of Elizade University Ilara-Mokin, a candidate must:

- a) pass all prescribed compulsory courses as well as University required courses and the Departmental electives;
- b) complete a minimum of 192 course units if admitted through UTME and a minimum of 164 course units, if by Direct Entry and obtain a CGPA of not less than 1.50; and
- c) complete successfully all field projects, laboratory practicals and industrial training. Direct Entry students are expected to pass General Studies Courses required by the university.

The breakdown of the graduation requirement is as follows:

- a) 22 units of Part I Physics, Chemistry, and Mathematics courses including MTH 101, MTH 102, MTH 103, CHM 101, CHM 102, PHY 101 and PHY 106; or such courses as prescribed for first year Sciences Foundation Option A; or exemption from these courses;
- b) 80 units of Civil Engineering courses;
- c) 15 units of Industrial Attachment and Engineering Valuation (SIWES I, SIWES II, CVE 402, CVE 404 and CVE 406)
- d) 12 units of Civil Engineering electives (approved options);
- e) 6 units on Design/Research Project (CVE 509);
- f) 6 units based in the Department of Electronic and Electrical Engineering; including GNE 223 and GNE 228;
- g) 3 units based in the Geology (CVE 303);
- h) 9 units based in the Department of Computer Science and Engineering– CSC 101; CSC 201 and CSC 102;
- i) 12 units based in the Engineering Mathematics comprising GNE 211, GNE 212, GNE 315 and GNE 316
- j) 9 units in the Department of English (GST 201, GST 202, GST 203, GST 214 and GST 301)

CURRICULUM OUTLINE (NEW CURRICULUM)

100-LEVEL

1ST SEMESTER

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load
				L	T	P	
CHM 101	General Chemistry I	3	C	2	1	0	3
CHM 103	Practical Chemistry I	1	C	0	0	3	3
MTH 101	General Mathematics I	3	C	2	1	0	3
PHY 101	General Physics I	3	C	2	1	0	3
PHY 103	Practical Physics I	1	C	0	0	3	3
GST 101	Communication in English I	2	C	1	1	0	2
GST 109	Use of Library, Study Skills & ICT	1	C	1	0	0	1
GNE 101	Introduction to Computer Technology	3	C	2	0	3	5
GST 111	Citizenship and Human Kinetics Education	1	E				
Total		18					23

*U - Unit, ST – Status, L – Lecture Hour(s), T – Tutorial Hour(s), P – Practical Hour(s)

100 LEVEL

2ND SEMESTER

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load
				L	T	P	
CHM 102	General Chemistry II	3	C	2	1	0	3
CHM 104	Practical Chemistry II	1	C	0	0	3	3
MTH 102	General Mathematics II	3	C	2	1	0	3
MTH 104	General Mathematics IV	3	C	2	1	0	3
PHY 102	General Physics II	3	C	2	1	0	3

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load
				L	T	P	
PHY 104	Practical Physics II	1	C	0	0	3	3
PHY 106	Properties of Matter	1	C	1	0	0	1
GNE 102	Engineer –in– Society	1	C	1	0	0	1
GNE 104	Intro. to Computational Software	1	C	1	0	0	1
GNE 106	Introduction to Engineering Drawing	1	C	0	0	3	3
GST 102	Communication in English II	2	C	1	1	0	2
Total		20					26

200 LEVEL

1ST SEMESTER

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load	Preq.
				L	T	P		
CSC 201	Computer Programming I	3	C	2	0	3	5	
GNE 251	Engineering Drawing I	3	C	1	0	6	7	
GNE 253	Engineering Mathematics I	3	C	2	1	0	3	MTH 101
GNE 255	Applied Mechanics	3	C	2	1	0	3	
GNE 257	Fundamentals of Electrical Engineering I	2	C	2	0	0	2	
GNE 259	Materials Science	3	C	2	0	3	5	
GNE 297	Fundamentals of Electrical Engineering Lab. I	1	C	0	0	3	3	
GST 215	Entrepreneurship I	2	C	2	0	0	2	
GST 205	Nigerian People and Culture	1	E	1	0	0	1	
Total		21					31	

200 LEVEL

2ND SEMESTER

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load	Preq.
				L	T	P		
GNE 252	Workshop Practice	2	C	1	0	3	4	
GNE 254	Engineering Mathematics II	3	C	2	1	0	3	MTH 102
GNE 256	Fundamentals of Fluid Mechanics	2	C	2	0	0	2	PHY 106
GNE 258	Fundamentals of Electrical Engineering II	2	C	2	0	0	2	GNE 257
GNE 260	Strength of Materials I	3	C	2	0	3	5	
GNE 262	Fundamentals of Thermodynamics	2	C	2	0	0	2	
GNE 296	Fundamentals of Fluid Mechanics Lab.	1	C	0	0	3	3	
GNE 298	Fundamentals of Electrical Engineering Lab. II	1	C	0	0	3	3	
GST 206	Environment and Sustainable Development	1	C	1	0	0	1	
GST 216	Entrepreneurship II	2	C	2	0	0	2	
GST 210	Introduction to Musicology	1	C	1	0	1	1	
Total		20					30	

300 LEVEL
1ST SEMESTER

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load	Preq.
				L	T	P		
GNE 351	Engineering Mathematics III	3	C	2	1	0	3	GNE 253
CVE 351	Introduction to Civil and Environmental Engineering	2	C	2	0	0	2	
CVE 353	Engineering Geology	2	C	2	0	0	2	
CVE 355	Engineering Surveying and Photogrammetry I	3	C	2	0	3	5	
CVE 357	Civil Engineering Materials	2	C	2	0	3	5	
CVE 359	Fluid Mechanics II	3	C	2	0	3	5	GNE256
CVE 361	Strength of Materials II	3	C	2	0	3	5	
Total		18						

300 LEVEL
2ND SEMESTER

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load	Preq.
				L	T	P		
GNE 352	Engineering Mathematics IV	3	C	2	1	0	3	GNE 254
GNE 354	Engineering Communication	2	C	2	0	0	2	
CVE 352	Hydraulics Engineering	2	C	2	0	0	2	CVE 359
CVE 354	Hydrology	2	C	2	0	0	2	
CVE 356	Soil Mechanics	3	C	2	0	3	5	CVE 353
CVE 358	Design of Structures I	3	C	2	0	3	5	
CVE 362	Structural Mechanics	3	C	2	0	3	5	
CVE 364	Elements of Civil Engineering detailing and Architectural Drawings	2	C	1	0	3	4	
Total		20						

400 LEVEL**1ST SEMESTER**

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load	Preq.
				L	T	P		
GNE 451	Engineering Statistics	3	C	2	1	0	3	
CVE 451	Civil and Environmental Engineering Practices	2	C	2	0	0	2	
CVE 453	Environmental Engineering I	2	C	2	0	3	5	
CVE 455	Structural Analysis I	3	C	2	1	0	3	
CVE 457	Design of Structures II	3	C	1	0	3	4	
CVE 459	Geotechnical Engineering I	3	C	2	0	3	5	
CVE 461	Highway and Transportation Engineering I	3	C	2	0	3	5	
CVE 463	Engineering Surveying and Photogrammetry II	3	C	2	0	3	5	CVE 305
Total		22						

400-LEVEL: 2ND SEMESTER and LONG VACATION

Course Code	Course Title	Units	S	Total Week Load			Preq.
				L	T	P	
CVE 200	Student Work Experience Programme (SWEP)	3	C	-	-	9	
CVE300	Student Industrial Work Experience I (SIWES I)	3	C	-	-	9	CVE 200
CVE 400	Student Industrial Work Experience II (SIWES II)	9	C	-	-	27	CVE 300
Total		15					

500 LEVEL

1ST SEMESTER

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load	Preq.
				L	T	P		
GNE 551	Engineering Law and Management	3	C	3	0	0	3	
CVE 555	Environmental Engineering II	2	-	1	0	3	4	CVE 403
CVE 557	Structural Analysis II	2	-	2	0	0	2	
CVE 591	Research Project Proposal	3	-	0	1	6	7	
CVE 561	Civil Engineering Measurements and Specifications	2	-	1	1	0	2	
CVE 567	Highway and Transportation Engineering II	2		1	0	3	4	
CVE 569	Civil Engineering Seminar	2	C	2	0	0	2	
	Electives (2 courses)	4	-				6	
Total		20						
Electives (2 courses) to be selected from the following list to emphasize areas of interest								
CVE 551	Civil Engineering Analysis and Design	2	E	2	0	3	5	
CVE 553	Building Technology	2	E	2	0	3	5	
CVE 559	Fire Protection and Safety Engineering	2	E	2	0	3	5	
CVE 563	Services Engineering	2	E	2	0	3	5	
Total								

500 LEVEL

2ND SEMESTER

Course Code	Course Title	U	ST	Contact hours per week			Total Week Load	Preq.
				L	T	P		
GNE 552	Engineering Economics and Valuation	3	C	2	1	0	3	
CVE 556	Environmental Engineering III	2	C	2	0	3	5	
CVE 568	Design of Structure III	2	C	1	0	3	4	
CVE 560	Geotechnical Engineering	3	C	2	1	0	3	
CVE 562	Transportation Engineering	2	C	2	0	3	5	
Electives (2 courses)		4					4	
CVE 592	Research Project II	3	C			9	9	
Total		19						
Electives (2 courses) to be selected from the following list to emphasize areas of interest								
CVE 564	Advanced Soil Mechanics	2	E	2	0	3	5	
CVE 566	Advanced Structural Engineering	2	E	2	0	3	5	
CVE 558	Construction Engineering	2	E	2	0	3	5	
CVE 554	Building Maintenance	2	E	2	0	3	5	
CVE 552	Risk Management and Safety Engineering	2	E	2	0	3	5	

OLD CURRICULUM (For graduating set of 2022/2023 and below)

400 LEVEL

1ST SEMESTER

Course Code	Course Title	Units	Status	Lecture	Tutorial	Practical
GNE 415	Engineering Analysis	3	C	2	1	0
CVE 401	Civil Engineering Practice	2	C	2	0	0
CVE 403	Drainage and Irrigation Engineering	3	C	2	0	3
CVE 405	Structural Analysis I	3	C	2	1	0
CVE 407	Design of Structures II	2	C	1	0	3
CVE 409	Elements of Foundation Engineering	3	C	2	0	3
CVE 411	Highway Engineering I	3	C	2	0	3
CVE 413	Engineering Surveying & Photogrammetry II	3	C	2	0	3
Total		22				

400 LEVEL

2ND SEMESTER

Course Code	Course Title	Units	S	L	T	Practical
CVE 402	SIWES assessed by University Supervisors	4	C	0	0	12
CVE 404	SIWES assessed by Industry-Based Supervisor	4	C	0	0	12
CVE 406	SIWES Seminar Presentation and Report	4	C	0	0	12
Total		12				

400 LEVEL

1ST SEMESTER

Course Code	Course Title	Units	S	L	T	P
GNE 415	Engineering Analysis	3	C	2	1	0
CVE 401	Civil Engineering Practice	2	C	2	0	0
CVE 403	Drainage and Irrigation Engineering	3	C	2	0	3
CVE 405	Structural Analysis I	3	C	2	1	0
CVE 407	Design of Structures II	2	C	1	0	3
CVE 409	Elements of Foundation Engineering	3	C	2	0	3
CVE 411	Highway Engineering I	3	C	2	0	3

Course Code	Course Title	Units	S	L	T	P
CVE 413	Engineering Surveying & Photogrammetry II	3	C	2	0	3
Total		22				

500 LEVEL

1ST SEMESTER

Course Code	Course Title	Units	S	L	T	P
GNE 501	Engineering Economics	3	C	2	1	0
CVE 505	Water Resources Engineering	2	0	1	0	3
CVE 507	Structural Analysis II	2	0	2	0	0
CVE 509	Civil Engineering Seminar	2	0	0	2	0
CVE 511	Civil Engineering, Measurements & Evaluation	2	0	1	1	0
CVE 531	Civil Engineering Analysis and Design	3	0	2	1	0
	Electives (2 courses)	6	0			
Total		23				
Electives (2 courses) to be selected from the following list to emphasize areas of interest						
CVE 517	Highway Engineering II	2	E	1	0	3
CVE 527	Building Technology	3	E	2	0	3
CVE533	Fire Protection and Safety Engineering	3	E	2	1	0
CVE 535	Services Engineering	3	E	2	0	3

³ Departmental Elective

500-LEVEL

2ND SEMESTER

Course Code	Course Title	Units	Status	L	T	P
GNE 502	Engineering Management	3	C	2	1	0
CVE 506	Basic Environmental Engineering	2	C	1	0	3

Course Code	Course Title	Units	Status	L	T	P
CVE 508	Design of Structure III	2	C	1	0	3
CVE 510	Geotechnical Engineering	3	C	2	1	0
CVE 512	Transportation Engineering	2	C	2	0	3
Electives (2 courses)		6				
CVE 590	Project	6	C			18
Total		21				
Electives (2 courses) to be selected from the following list to emphasize areas of interest						
CVE 524	Advanced Soil Mechanics	3	E	2	0	3
CVE 526	Advanced Structural Engineering	3	E	2	0	3
CVE 528	Construction Engineering	3	E	2	0	3
CVE 534	Building Maintenance	3	E	2	0	3
CVE 536	Risk Management and Safety Engineering	3	E	2	1	0

COURSE DESCRIPTION (NEW CURRICULUM)

CHM 101: General Chemistry I

3 Units

Atoms, atomic structures, atomic theory, atomic spectra, Aufbau method, Hund's rule, Pauli Exclusion principles, Periodicity and periodic table, molecules, chemical equation and stoichiometry Rates of chemical reaction, energetics Thermochemistry and simple calculations involving Hess's law, Bonding and intermolecular forces, Hybridisation and shapes of molecules (Valence Forces; structure of Solids; molecular and ionic forces). Metals and extraction of metals, The Chemistry of selected metals and non- metals Chemical equilibrium reactions, Properties of gases, solutions, Redox reactions, Introduction to Electro chemistry, -, electrolytic and galvanic cells, Fuel cells, electrode potential, half-cell equation. Faraday laws of electrolysis, Corrosion. Colligative properties, corrosion, Acid, Bases and salts, Introduction to Radioactivity.

CHM 103: Practical Chemistry I

1 Unit

Calibration of Measuring Instrument; Standardization of HCl with Standard Sodium carbonate; Standardization of alkali with standard potassium hydrogen phthalate. Determination concentrations of commercial (H₂SO₄, HNO₃, NaOH); Preparation of Sulphide of Copper and

determination of its Empirical Formula.; Determination of the atomic weight of a metal by forming its Oxides; Determination of atomic weight of a metal from the volume of Hydrogen it displaced from an acid; preparation of double salts; determination of heat of neutralization; determination of Faraday's constant. Introduction of scientific techniques to local science in the environment.

MTH 101: General Mathematics I **3 Units**

Elementary set theory, subsets, union, intersections, complement, Venn diagrams. Real numbers; integers, rational and irrational numbers, mathematical induction, real sequences and series, theory of quadratic equations, binomial theorem. Complex numbers; algebra of complex numbers; the Argand Diagram. De Moivre's theorem, n^{th} roots of unity. Circular measure trigonometric functions of angles of any magnitude, addition and factor formulae.

PHY 101: General Physics I **3 Units**

Space and Time, frames of reference, Invariance of physical laws, relativity of simultaneity, relativity of time intervals, relativity of length, units and dimension; standards and units, unit consistency and conversions. Kinematics vectors and vector addition, components of vectors, unit vectors, products of vectors. Displacement, Time and average velocity, instantaneous velocity, average acceleration, motion with constant acceleration, freely falling bodies, position and velocity vectors, acceleration vector, projectile motion. Motion in a circle and relative velocity. Fundamental laws of mechanics: forces and interactions, Newton's first law, Newton's second law, mass and weight, Newton's third law. Statics and dynamics: application of Newton's laws, dynamics of particles, frictional forces, dynamics of circular motion. Galilean invariance, universal gravitation, gravitational potential energy, elastic potential energy, conservative and non-conservative forces. Work and energy, kinetic energy and the work-energy theorem, power, momentum and impulse, conservation of momentum, collisions and momentum conservation, elastic collisions, centre of mass. Rotational dynamics and angular momentum angular velocity and acceleration, energy in rotational motion, parallel axis theorem, torque, torque and rotation about a moving axis, simple harmonic motion and its applications. The simple pendulum, damped oscillations, forced oscillations and resonance.

PHY 103: Practical Physics I **1 Unit**

This introductory course emphasizes quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques will be employed. The experiments include: Mechanics: timing experiments, simple pendulum, compound pendulum, measurement of g , moments, determination of moment of inertia, measurement of viscosity, use of force board, law of momentum. Optics: reflection using plane mirror, convex/concave mirror, concave/convex lens, refraction using a prism, critical angle, apparent depth/real depth, simple microscope, compound microscope.

GST 101: Communication in English I **2 Units**

Introduction: the nature and functions of language, varieties and styles of English usage. Time Management. Study Skills; contemporary definition of literacy, introduction to the language

skills. Vocabulary development: word formation, meaning relationships, register. Listening and Lecture Comprehension. Note -taking/note-making. Introduction to reading for Academic Purposes. Revision and test-taking skills.

GST 109: Use of the Library and Information Literacy 1 Unit

Definition and types of library. Example of a library set up (introduction to the EUIM library). Organisation of a library. Forms of recorded information: print, non-print and electronic forms. Reference sources and services. Serials and periodicals. Use of ICT in the library. Internet applications: e-resources, social media networks, databases. Virtual libraries. Organization and retrieval of knowledge. The library catalogue. Classification schemes. Introduction to report writing. Search strategies, referencing. Referencing styles.

ELP 101: Entrepreneurial Leadership I 2 Units

Entrepreneurial Leadership (EL) is one of four courses that makes up the Leadership Core programme. In this course, students will be made to explore the intersection between great leaders and entrepreneurial thinking. The Entrepreneurial Leadership course seeks to empower students with mind-sets and skills essential for success as a self-starting individual with the capability to lead and engage with others, create impactful solutions in the communities they live in, and create positive impact and transformation in Africa. The hallmark of the EL course content is using experiential learning, reflection and practical application to develop leadership, teamwork, and problem-solving skills. The course content includes topics such as learning about emotional intelligence as a key skill for any entrepreneurial leader, there will also be lessons about how to identify PICS (Passions, Interests, Causes, Skills). Students will also learn about creative problem-solving technique called Human Centered Design. Students will also be exposed to the concept of empathy and how it plays a major role in everyday life. Prototyping and Continuous Iteration will also be taught.

GNE 101: Introduction to Computer Technology 3 Units

History of Computers; functional components of a computer; characteristics of a computer system. Definition of computer science. History of computer science and their generations, Computer Hardware; Modern I/O units. Software: Operating Systems, Application Packages Program: Development; Flowcharts and Algorithms; Program Object; VISUAL BASIC programming language serves as the vehicle to illustrate the many concepts.

GST 111: Citizenship and Leadership Education 2 units

Citizenship, qualities of a good citizen. Human rights, limitations to citizen's rights, protection of citizens' rights, duties and obligations: duties of citizens, obligations of citizens to the state. Moral principles and moral obligations, Drugs and medicines, drug abuse and its effects, drugs and health care, prescription and compliance, natural medicines and ethno therapy. Family life education: reproductive health, harmful health, practice safe motherhood, relationships and sexual behavior. Concepts of health and disease: concepts of well-being and disease, disease

causation, HIV/AIDS, transition, prevention and control, stigmatization of responsibility, types of leadership, leadership and political power; Goal setting, vision and mission, Delegation of duties.

CHM 102: General Chemistry II **3 Units**

Historical survey of the development and importance of organic chemistry, nomenclature and classes of organic compounds, Homologous series; isolation and purification of organic compounds; qualitative and quantitative- determination of empirical and molecular formulae, percentage purity, yield, organic chemistry; stereochemistry; determination of structure of organic compounds; Electronic theory in organic chemistry; Saturated hydrocarbons and Unsaturated hydrocarbons; alkenes, alkynes and aromatics. Functional group; carbonyls, halides, carboxylic acids and hydroxyl, Valence Forces; structure of Solids; molecular and ionic forces. The Chemistry of selected metals and non- metals—relative abundance

CHM 104: Practical Chemistry II **1 Unit**

Identification of elements in an organic compound Lassaigne: sodium fusion Test; Ignition Tests; Separation of mixtures, determination of Melting points; Re-crystallisation; Simple experiment reactions of Urea (carbamide); Test for aldehydes; Detection of carbonyl] group. Ignition test, Estimation of iron in ferrous ammonium sulphate using standardized potassium permanganate, Qualitative inorganic analysis.

MTH 102: General Mathematics I **3 Units**

Calculus: 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, Definite integral. Application to areas. Volumes etc.

MTH 104: General Mathematics IV **3 Units**

Vectors in Euclidean spaces, vector products, equation of lines and planes, element of vector calculus. General kinematics: momentum, angular momentum, fundamental equations of motion, energy and conservative laws. Dynamics of a particle and of a rigid body.

PHY 102: General Physics II **2 Units**

Electrostatics: Conservation law of electric charges, electrons and electrostatics, Coulomb's law, electric field and forces, electric field line, electric dipoles charged particles in an electric field, charge and electric flux, Gauss's law and its applications, electric potential, electric potential due to a single charge, electric potential due to a dipole, electric potential due to continuous charge distribution equipotential surfaces. Conductors and currents: electric current, resistors and resistance, electric power, capacitors in series and parallel, energy storage in capacitors and electric field energy, Gauss's law in dielectrics. Magnetism: magnetic field, magnetic field lines and magnetic flux, motion of a charged particles in a magnetic field, magnetic force on a current carrying conductor, Ampere's law, Biot-Savart law, electromagnetic induction, inductance, self-inductance, mutual inductance, Maxwell's equation, electromagnetic waves and oscillations.

PHY 104: Practical Physics II **1 Unit**

Electricity: Ohm's law, heating effect of a current internal resistance of a cell, Metre/Wheatstone bridge, potentiometer measurement of ece, plotting of magnetic field. Heat: measurement of specific capacity of water, and a solid, expansion of gas experiment using a long capillary tube, Joule's law. Sound: resonance tube, Sonometer.

PHY 106: Properties of Matter **2 Units**

Molecular treatment of properties of matter, elasticity; Hooke's law. Young's shear and bulk moduli. Hydrostatics; Pressure; buoyancy. Archimedes principles. Hydrodynamics; Streamlines Bernoulli and continuity equations. Turbulence, Reynolds number. Viscosity; Laminar flow, Poiseuilles's equation. Surface tension; adhesion, cohesion, capillarity, drops and bubbles. Temperature; zeroth law of thermodynamics; heat; gas laws of thermodynamics; kinetic theory of gases. Application.

GNE 102: Engineering in Society **1 Unit**

Philosophy of Science and Engineering. History of Engineering and Technology. The Engineering profession - engineering - engineering literacy professional bodies and engineering societies. Engineers' code of conduct and ethics. Engineers and Nation Building - economy, politics, business, safety in Engineering and introduction to Risk analysis. Case studies from invited professionals.

GNE 104: Introduction to Computational Software **1 Unit**

This course covers the introduction and applications of commonly used computational software packages. Overview of Computational Software. Evolution and trends in Computational Software development. Using MATLAB as an example of computational Software. Introduction to MATLAB. Basic features of MATLAB. Creating MATLAB variables; managing MATLAB workspace; MATLAB mathematical functions. Basic plotting; Matrix generation; Array operations and Linear equations. Introduction to programming in MATLAB. Control flow and operators. Debugging M-files. Introduction to other computational software packages: overview of GNU Octave and Scilab.

GNE 106: Introduction to Engineering Drawing **1 Unit**

Introduction to drawing instruments, scales, draughting aids and their proper use. Size of paper and drawing layout. Dimensioning, line work, layout and lettering. Geometrical constructions and Engineering graphics. Graphical calculus and Applications. Circles and Tangents. Conic sections, various methods of their construction. Cycloid, epi and hypocycloids. Involute. Archimedes spiral. Loci: the helix (cylindrical and conical) single and multi-start threads. Introduction to projections.

GST 102: Communication in English II **2 units**

Awareness raising: sources and types of writing errors. Grammatical structures: element of the sentence. Word, Phrase and Clause. Sentence types: classification by structure and function. The paragraph: definition and characteristics, patterns of development. Varieties of writing: discourse types, writing formats. The Mechanics of writing. The academic writing processes.

ELP 102: Entrepreneurial Leadership II 2 Units

This course will continue to equip students, with skills and mind-sets that will enable them to unlock leadership potentials and transform into high performing citizens of integrity who will go on to lead communities, companies and organizations. Leadership paradigms will also be explored. Other topics will include introduction to lean canvas and customer segmentation, lifelong values and value proposition, introduction to sustainability, introduction to legal entity and pitching.

CSC 201: Computer Programming I 3 Units

An introduction to computer programming with emphasis on mathematical problems using python programming language or any other scientific programming language. Introduce students to computers, compilers and editors, and they are expected to write medium-sized programs. Implementation of concepts such as binding, scope, looping, branching, subprograms and parameter parsing, tasks and concurrency, heap management, exception handling, templates, inheritance and overloading.

GNE 251: Engineering Drawing I 3 Units

Development of geometrical figures and intersection of solids and curves. Projections – lines, planes and simple solids. Orthographic projections in first and third angles. Isometric Projection; sections and sectioning, auxiliary views and staggered sectioning. Pictorial/Freehand Sketching. Conventional practices with Simple examples, including threads and threaded fasteners, cam profiles and Assembly drawing from detailed components. Introduction to Computer Aided Drafting: Electronic draughting packages: principle and use in engineering design. Simulation packages: principle and use in engineering.

GNE 253: Engineering Mathematics I 3 Units

Complex analysis – Elements of complex algebra, trigonometric, exponential and logarithmic functions. Real number, sequences and series. Composite functions, matrices and determinants. Vectors – Elements, differentiation and integration, Elements of linear algebra, Calculus – Elementary differentiation. Relevant theorems.

GNE 255: Applied Mechanics 3 Units

Forces, force resolution, moments, couples, Varignon's theorem. Equilibrium of simple structures and machine parts. Friction. First and second moments of area; centroids. Kinematics of particles and rigid bodies in plane motion. Newton's laws of motion. Kinetic energy and momentum analyses.

GNE 257: Fundamental of Electrical Engineering I 2 Units

Fundamental theory of electric circuit. Direct current (DC) circuit elements. Basic circuit laws and theorems—Ohms Law, Kirchoff's Laws; Superposition, Thevenin and Norton's theorems. Nodal and loop analysis of circuits, single time-constant circuits. Steady state response of circuit elements and network. Complex impedance and admittance. Alternating current (AC) circuits impedance, admittance, susceptance, and phasor diagrams. Introduction to electronics, an overview of tubes (vacuum diode, triode and pentode). Elementary discussion of semiconductors PN junction diode and bipolar Junction Transistor. Small signal equivalent circuits.

GNE 259: Materials Science 3 Units

Review of properties of matter, relationships between structure and properties of metals, alloys, ceramics and plastics. Atomic and molecular structure, crystals, Metallic states, Defects in crystals, conductors, semi-conductors and insulators. Alloy theory – Application to industrial alloys – steel in particular. Engineering Properties – Their control, Hot and cold working, heat treatment, etc. Creep, fatigue and fracture. Corrosion and corrosion control. Non-metallic materials – glass, rubber, concrete, plastics, wood and ceramics. Elastic and plastic deformations: Defects in metals.

GNE 297: Fundamentals of Electrical Engineering Laboratory I 1 Unit

Identification of resistors and resistor color coding, Series connections, Parallel connections, Verification of Ohm's law, Verification of Kirchhoff's Voltage Law, Verification of Kirchhoff's Current Law, Loop analysis, Verification of Thevenin's Theorem, Experiment to verify Norton's theorem, Superposition Theorem.

GST 215: Entrepreneurship I 2 units

Introduction to entrepreneurship and new venture creation. Theory of entrepreneurship. Types of business organization. Initiating enterprises. Sources of finance/raising capital cost. Budgeting techniques and financial planning. Managerial functions with special emphasis on staffing. Marketing and the new venture. Accounting and special tax problems. Insurance issues in business. Environmental impact considerations. Student's business proposal.

GST 205: Nigerian People and Cultures 1 unit

Introduction to Nigerian history, Introduction to Nigerian culture. Sources of Nigerian history. Culture and socialization. Primitive science and technology. Traditional religion and belief systems, Penetration of Christianity and Islam. Traditional political structures and administration. Modern day politics and culture. Culture and economic development. Traditional financial institutions. Festival and ritual in Nigerian culture. Festival as drama. Understanding the People/Cultures of Nigeria through their Art. The role of museums. Nigeria literature. The quest for appropriate technology. Cultural revival.

GNE 252: Workshop Practice 2 Units

Safety procedure in workshop and Workshop setting; Types of workshop equipment, machines and materials; Use of instruments and tools (hand and machine tools), Measurement and marking

out; Bench work and fitting; Machine operation practice. Carpentry: Hand tools and working principles; Joints and fastenings: bolt, rivet, welding, brazing, soldering. Invited lectures from Professionals.

GNE 254: Engineering Mathematics II 3 Units

Differential equations – Exact Equations. Methods for second order equations. Partial differential equation. Simple cases – Applications, Numerical Analysis – linear equations, non-linear equations. Transformation and mapping: special functions. Finite difference operators: Introduction to linear programming.

GNE 256: Fundamental of Fluid Mechanics 2 Units

Nature and types of fluids; Physical properties of fluids; Fluid statics, stability of submerged and floating bodies; Fluid flow concept; conservation of mass, momentum energy; Simple applications of conservation laws; Flow measurement.

GNE 258: Fundamental of Electrical Engineering II 2 Units

Periodic waveforms and their average and effective values. Characteristics and use of non-linear elements in simple circuits. Magnetic circuits, single-phase alternating current (AC) circuits. Series and parallel resonance. Power factor correction, magnetic circuit, mutual inductance. Introduction to electric machines, machine designs, and polyphase systems; DC generators and motors. Electrical and electronic power measuring instruments and equipment, AC and DC bridges. Basic control system, span/closed loop system. Introduction to basic communication fundamentals.

GNE 260: Strength of Materials I 3 Units

Hooke's law; Method of superposition; Stress and deformation resulting from temperature changes; Elastic Constants; Stress in thin cylinders and spheres; Stresses on inclined planes. Principal stresses, Mohr's circle. Structural mechanics of statistically determinate rigid body systems and plane pin-jointed frames; Bending moment and shear force in beams, Simple beam and deflection of beam, truss and elastic buckling of columns; Simple torsion and application; Stress and strain transformation equations.

GNE 262: Fundamentals of Thermodynamics 2 Units

Basic concepts, quantitative relations of Zeroth, first (applications to open and closed systems; The steady State flow/ Bernoulli's equation and applications), second and third laws of thermodynamics. Behaviour of pure substances and perfect gases; Ideal gas cycles.

GNE 296: Fundamentals of Fluid Mechanics Laboratory I 1 Unit

Determination of Fluid properties. Pressure measurement. Hydrostatic force on plane surface. Determination of metacentric height. Determination of stability of floating bodies. Verification of Bernoulli's theorem.

GNE 298: Fundamentals of Electrical Engineering Laboratory II 1 Unit

Alternating current waveforms: Sine wave, square wave and triangular wave forms, RLC Series Circuits, RLC Parallel Circuits, Half wave rectification Circuit, Full wave rectification Circuit, Design and Construction of Monostable Multivibrator, Design and Construction of Astable Multivibrator, Design and Construction of Bistable Multivibrator, Series and parallel Resonant Circuits, Design and Construction of filters.

GST 206: Environment and Sustainable Development 1 Unit

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

GST 216: Entrepreneurship II 2 Units

Photography, 2D & 3D animation & motion graphics, Beed making, event planning and management, Fashion designing, Tighing and Dyeing/Adire Fabrics, Shoe & Bag making, Make-up and gele.

GST 210: Introduction to Musicology 1 Unit

Elements of music; rhythm combination and extension. Choral singing, ensemble work and special instrument (including voice).

GNE 351: Engineering Mathematics III 3 Units

Fourier series – Euler coefficients, even and odd functions, Sine and Cosine, functions, simple applications, Gamma, Beta and probability functions. Differential equation of second order–series solutions. Legendre and Bessel functions and their properties. Vector Theory – Dot product, cross product, divergence, curl and Del operators. Gradient. Line, Surface and volume integrals and related theorems.

CVE 351: Introduction to Civil and Environmental Engineering 2 Units

The definitions and meaning of Engineering, Civil and Environmental Engineering and its various specialties. Historical development of Civil and Environmental engineering. Introduction to the various branches and specialties in Civil and Environmental Engineering. The profession of Civil and Environmental Engineering and its role in the society. Civil Engineering as a profession – functions, training and responsibilities. Overview of the sub-disciplines of civil engineering. States of engineering project execution, including conception, feasibility studies, detailed design, preparation of Bill of Quantities and contract documents. Roles of different grades of workers on a project – labourers, artisans, technologists, engineers, project planning. Requirements of a Civil and Environmental Engineer. Philosophy and responsibilities of the profession. Career opportunities in Civil and Environmental Engineering. Discussion and demonstration of Civil and Environmental Engineering techniques and projects, problems, solutions. Introduction to the frontiers of research and development in Civil and Environmental Engineering. Modern Civil and Environmental Engineering applications in the society.

CVE 353: Engineering Geology**2 Units**

Rock types and stratigraphy: Igneous, metamorphic and sedimentary; Geological structures: fold, faults, joints; Surface processes: weathering, mechanical, chemical and biological, engineering classification of weathering, movement of slopes, glaciation, storm, surge and tsunamic; Groundwater conditions and supply: water-table concept, aquifer, porosity and permeability, groundwater exploration; Geological materials used in construction; Site investigation: desk study; preliminary reconnaissance, site exploration; Geology of Nigeria and mapping.

CVE 355: Engineering Surveying and Photogrammetry I**3 Units**

Introduction – Principles of survey operations – Classification of survey methods, instruments and their uses. Theory of survey measurements – Linear measurements. Chain Surveying. Compass surveying – Methods; Contours and their uses. Traversing methods and applications. Levelling – Geodetic leveling – errors and their adjustment. Applications. Tacheometry – Methods; Substance heighting, self-adjusting and electromagnetic methods. Introduction to Photogrammetry and Remote Sensing.

CVE 357: Civil Engineering Materials**2 Units**

Concrete Technology – Types of cements, aggregates – properties, Concrete mix. Design, Properties and their determination. Steel Technology – Production, fabrication and properties: corrosion and its prevention. tests on steel and quality control. Timber Technology – Types of wood, properties, defects. Stress grading, Preservation and fire protection. Timber products. Rubber, plastics; Asphalt, tar, glass, lime, bricks, etc. Applications to buildings, Roads and Bridges.

Practical

Determination of the specific gravity of cement powder, standard consistency of cement paste; initial setting time and final setting time of Portland cement. Evaluation of the soundness of Portland cement. Conduction of the grading analysis of fine aggregates. Determination of the aggregate crushing value of coarse aggregates; workability of fresh concrete by the slump test and compacting factor; modulus of rupture for plain concrete specimen by conducting a bending test; moisture content of a given timber specimen and its dry density; modulus of rupture of timber specimen; specific gravity of bituminous materials; consistency, durability and temperature susceptibility of asphalt cement. Preparation of highway surfacing material

CVE 359: Fluid Mechanics II**3 Units**

Fluid statics: Floatation and stability. Dynamics of fluid flow-conservation equation of mass and momentum: Euler and Bernoulli equations. Introduction to incompressible viscous flow. Reynold's Number. Dimensional analysis – Philosophy, Similitude, Buckingham PI theorems. Applications. Hydraulic model. Flow measurements. Flow meters, errors in measurement.

CVE 361: Strength of Materials II**3 Units**

Advanced topics in Bending moment and shear force in beams. Theory of bending of beams. Deflection of beams. Unsymmetrical bending and shear centre. Applications. Strain energy. Biaxial and triaxial state of stress. Transformation of stresses. Mohr's circle. Failure theories. Springs. Creep, fatigue, Fracture and stress concentration.

GNE 352: Engineering Mathematics IV 3 units

Complex variables – advanced topics, differentiation and integration of complex functions. Cauchy – Riemann equations: Related theorems. Laplace and Fourier transforms – Applications. Introduction to non-linear differential equations – stability and Applications.

GNE 354: Engineering Communication 2 Units

Oral communication: Public speaking skills with effective use of visual aids and statistical and technical information. Principles of effective communication in interpersonal and mass communication process. Effective reading skills- extracting main ideas and reading for specific information through speed reading. Written communication: principles of technical writing. Planning and experimental design; data collection and analysis; scientific writing and presentation. Grant writing and funding sources. Ethics and intellectual property. Professional use of English Language for letters, specification descriptions, presentation of charts, graphs, tables, writing of proposals in reports. Case studies of major engineering designs and construction/fabrication as well industrial failures; seminar presentation of reports and proposals. Project report presentation.

CVE 352: Hydraulics Engineering 2 Units

Simulation of complex flow fields using sources, sinks uniform flows and doublets and combinations of vortices. Steady and unsteady flows in open channels. Dimension analysis and similitude. Hydraulic modelling techniques, Pipe network analysis, Design of reticulation systems. Unsteady flows in pipes with special emphasis on water hammer and the use of surge tanks. Flow measurement, Flow in closed conduits – steady and unsteady flows. Flow through hydraulic structures including river and coastal hydraulics. Hydraulic machinery – pumps and turbines.

Practical

Study of Laminar flow, flow measurements in open channel, hydraulic jump.

CVE 354: Hydrology 2 Units

The hydrologic cycle. Precipitation, infiltration, evaporation, groundwater, surface run-off, floods and droughts. Physical and statistical analysis related to hydrologic processes. Flood routing techniques. Hydrologic systems analysis. Hydrography analysis. Unit hydrograph theory. Occurrence and distribution of water in nature. Hydrogeology, Fundamentals of flows in porous media. Equations governing flows in aquifer. Exact and approximate solutions. Flows in layered aquifer systems. Groundwater analysis including well hydraulics; Design criteria for hydraulic projects.

CVE 356: Soil Mechanics**2 Units**

Formation of soils. Particle size analysis – sieve analysis and hydrometer test, Atterberg limits: liquid, plastic and shrinkage limits. Soil classification, Phases in soil – void ratio, porosity, specific gravity and other, Seepage and permeability. Flow of water in soil. Soil compaction, Principle of effective stress; Consolidation and settlement calculations; Shear strength of soils. Bearing capacity.

Practical

Moisture content determination, Liquid and Plastic limits of soil, shrinkage limit, Particle size distribution – mechanical method, Particle size distribution – hydrometer method; Specific gravity of soils. Unconfined compression test; California bearing ratio (CBR) test, Triaxial test – Without pore pressure measurement, Direct shear test, Consolidation test.

CVE 358: Design of Structures I**3 Units**

Design fundamental – approach, means of evaluation, critical evaluation. Building regulation, Codes of practice. Design philosophy with regards to Elastic design, load factor method and limit state design. Introduction to reinforced concrete. Limit state analysis. Design of reinforced concrete beams, columns, slabs. Shear bonds and anchorage considerations. Yield line theory. Detailing of simple reinforced concrete elements and bar bending schedule.

CVE 362: Structural Mechanics**2 Units**

Analysis of determinate structures, Beams, Trusses; Structure Theorems. Graphical methods: Application to simple determinate trusses. Willmot Mohr diagram. Deflection of statically determinate structures. Unit load, moment area methods. Strain Energy Methods. Introduction to statically indeterminate structures.

CVE 364: Elements of Civil Engineering Detailing and Architectural Drawing 2 Units

Introduction – Dimensional awareness, Graphic communication, relation to environments. Free hand drawing – form in terms of shades, light and shadow. Orthographic; diametric, perspective projections: Applications. Common curves. Elementary Designs. Computer Aided Design and Drawing (CADD). Review of dimensional awareness, techniques in drafting of engineering drawings, plan and profile. Preparation of structural drawings from architectural drawings. Structural detailing; reinforcement schedule; structural working drawings of Civil Engineering structures.

GNE 451: Engineering Statistics**3 Units**

Elements of statistics; Descriptive statistics, frequency distribution, populations and sample, central tendency, variance data sampling, mean, median, mode, mean deviation, percentiles etc. Probability. Binomial, poisson hyper-geometric, normal distributions, etc. Statistical inference

intervals, tests hypothesis and significance. Estimating Engineering Quantities: Estimators Methods, Confidence Limits and Tolerance. Hypothesis testing; Statistical Inference and Engineering decision situations, operating characteristics curves, parametric and non-parametric tests of engineering data. Introduction to analysis of variance, regression. ANOVA, R-estimates, confidence intervals, correlation analysis. Statistical computer routines.

CVE 451: Civil and Environmental Engineering Practices 2 Units

Civil Engineering Work Standards and measurements. Contracts and sub-contracts. Works construction and supervision. Job planning and control – Programme Charts – Bar charts. Critical path methods, etc. Construction machinery and equipment. Applications/Case study-dams, foundations, bridges, highways, industrial buildings, sewage works.

CVE 453: Environmental Engineering I 2 Units

Role of the Engineer in the control of the environment in relation to water-related diseases. Examination of water and wastewater. Collection, treatment, protection and distribution of water. Collection, treatment and disposal of wastewaters. Analysis and design of surface and combined drainage systems, collectors, storages and pumps. Methods of overflow protection of large areas. Analysis and design of irrigation systems. Soil-plan-water relationships. Water supplies, water delivery systems and water distribution systems.

Practical

Determination of alkalinity, acidity and pH in water. Jar test experiment, (coagulation) for determination of optimum dosage of alum, lime, speeds of slow mixing and rapid mixing etc. Bacteriological examination of water. Determination of solids concentrations (suspended solids, dissolved solids, total solids, and volatile suspended solids). Determination of chlorine, dissolved oxygen in water.

CVE 455: Structural Analysis I 3 Units

Indeterminate structural analysis: Energy and Virtual work Methods, Slope deflection and Moment distribution methods. Elastic Instability. Simple plastic theory of bending. Collapse loads. Stress-Grading of Timber, visual mechanical and electronic stress grading of Timber.

CVE 457: Design of Structures II 2 Units

Limit state philosophy and design in steel – basic concept of elastic and plastic design. Design and detailing of structural steel elements – a tension, struts, beams, girders and columns. Design of connections in structural steel. Beam column design. Introduction to the complete design of industrial buildings in structural steel. Design of water retaining structures.

CVE 459: Geotechnical Engineering I 3 Units

Stresses in soils: Total and effective stress, pore pressure. Moduli of Elasticity, Poisson's ratio. Introduction to stress distribution in layered system from Boussinesq's theory, Westergaard

theory. Earth retaining structures: Earth pressures (active, passive and at-rest pressures), earth pressure coefficients, Computation of earth pressure using the Rankine and the Coulomb wedge theories, and Culman's method. Earth pressures on retaining walls. Types and analysis of retaining walls. The use of bracings as lateral support in open cuts. Anchored bulkheads. Free earth support method of analysis. Bearing capacity: Ultimate, safe and allowable bearing capacities. Bearing capacity factor. Case of shallow and deep foundations. Factor of safety, shape effect, footings under eccentric and inclined loads. Foundation: Type and choice of foundations. Shallow and deep foundations, raft foundations and piles. Use and general characteristics of piles, piles and sand piles in clay, negative skin friction. Bearing capacity of pile groups. Eccentric vertical loads, dynamic pile driving formulas and efficiency of pile groups.

CVE 461: Highway and Transportation Engineering I **3 Units**

Soil engineering aspects of highways: compaction, soil stabilization, soil classification and effect on usage, Methods of soil classification, Determination of California Bearing Ratio (CBR) and applications. Highway geometrics and designs: Highway route location procedure, Factors affecting highway route location. Factors affecting highway geometric design. Generation of Base Map. Horizontal alignment design, Vertical alignment design, cross-sections. Classification of highways, Distinction between rural and urban roads, Railways and Airfields.

CVE 463: Engineering Surveying and Photogrammetry II **3 Units**

Further work on contours and contouring: Methods of contouring, contour interpolation and uses of contour plans and maps. Areas and Volumes. Setting out of Engineering Works. Elementary topographical surveying: Elements of photogrammetry, Photogrammetry equipment and Errors of Measurement.

CVE 200 **3 Units**

The SWEP at the end of 200 level should take place during the long vacation, after the students must have gone. through the general aspects of engineering courses and they are expected to have good practical exposure to the general engineering processes and equipment. The exposure can be given by the roadside mechanic, roadside welders, roadside brick layers, roadside electronic and radio repairers and also by the University Workshops and Works and Maintenance Departments. The training should, as much as possible, cover the following areas.

- a. **Vehicle Maintenance:** Introduction to various auto parts, vehicle repairs, including tune-up operations and engine overhaul. .
- b. **Introduction to Welding and Fabrication:** Introduction to different welding equipment, various simple welding operations, and fabrication of simple mechanical structures.
- c. **Plumbing Works and Building:** Simple exposure to the maintenance of toilets showers sinks in the offices, hostels, etc. Building maintenance, brick laying etc.

d. Machine and Woodwork Workshops:

- i. Introduction to various machine tools, use of lathe machines, drilling machines, milling machine, grinding machine, and the use of simple hand tools.
- ii. Introduction to woodworking machine tools and the use of woodworking hand tools. If possible, production of small components using the above mentioned machine tools.

e. Applications of Electricity and Electronics

- i. Exposure to trouble-shooting and maintenance of electrical/electronic equipment e.g. Radio set, Television sets, etc.
- ii. Rewinding of simple machines such as fan motors, small transformers, etc.
- iii. Maintenance and care of batteries
- iv. Wiring of motor starters (e.g. direct-on-line, star-delta, etc), contactors and relays.
- v. Electrical installation practice
- vi. Operation of stand by generators
- vii. Practical construction of Electric/Electronic Circuit

It is expected that the students will be attached to each of the above areas for a suitable length of time subject to a total of eight weeks of training.

GNE 551: Engineering Law and Management

3 Units

Law of contracts for Engineers: offer, acceptance, communication termination. General principles of criminal law. Law of torts: definition, classification and liabilities. Patents: requirements, application, and infringement. Registered designs: application, requirements, types and infringement. Company law. Labour law and Industrial Law.

Principles of organization; elements of organization; management by objectives. Financial management, accounting methods, financial statements, cost planning and control, budget and budgetary control. Depreciation accounting and valuation of assets. Personnel management, selection, recruitment and training, job evaluation and merit rating. Industrial psychology. Resource management; contracts, interest formulae, rate of return. Methods of economic evaluation. Planning decision making; forecasting, scheduling. Production control. Gantt Chart, CPM and PERT. Optimization, linear programming as an aid to decision making, transport and materials handling. Raw materials and equipment. Facility layout and location. Basic principles of work study. Principles of motion economy. Ergonomics in the design of equipment and process.

CVE 555: Environmental Engineering II

2 Units

Introduction to the theory, design, construction operations and maintenance of facilities for treatment, pumping, storage distribution of water; and for collection, treatment and disposal of wastewaters. The Hydraulics of open channels and Wells. Drainage. Hydrograph Analysis. Reservoir and Flood-routing. Hydrological forecasting Hydraulic Structures, i.e. Dams, Dykes/Levees, Weirs, Docks and Harbours, Spillways, Stilling basins, Man Holes and Coastal Hydraulic Structures, etc. Engineering Economy in Water Resources Planning

CVE 557: Structural Analysis II **2 Units**

Theory of Elasticity; Plates in flexure; Thin-stretched membrane; Beams on elastic foundation; Finite difference method of structural analysis, Partial differential equations; Shells and revolutions; Elastic instability; and Critical load analysis

CVE 591: Research Project Proposal **3 Units**

Final year students' individual or group proposal projects in one of the several areas of Civil Engineering, under the supervision of the academic staff of the Department or School. These independent proposal projects may involve literature research, design, elementary fabrication, and construction or feasibility studies. The student is required to plan and carry out the proposal project under the supervision of academic member of staff. A formal report of the proposal project is required at the end of the first semester. The student is required to present his/her results orally before a panel of examiners.

CVE 561: Civil Engineering Measurements and Specifications **2 Units**

Legal and professional relations in engineering preparation of specifications and Bill of Quantities. Contract laws, including essential elements of a valid contract. Labor laws, advertising. Contract documents. Legal aspects of construction supervision. Bill of quantities: price build up, work content and method statement. SMM specifications, resource rate etc. Types of building contracts: measurement and cost reimbursement contracts. Condition of contracts. Final accounts measurement, fixing of rates. Analysis of tender and evaluation of building projects, variation; interim certificates evaluation. The scope of civil engineering works and methods of measurement. Measurements involving site investigation, site clearance, excavation, dredging and filling, geotechnical processes. Earthworks, embankment and cuttings, retaining walls, Piling, road and railway works, bridges and culverts; and tunnelling.

CVE 567: Highway and Transportation Engineering II **2 Units**

Highway Planning and Traffic Surveys, Structural Design of Highway: Types of pavement, AASHTO Definitions. Methods of pavement design – British Method, French Method, Empirical design methods for developing countries (Road Note 31), Pavement materials and laboratory tests; Highway Construction. Administration and economics analysis of highway projects. Pavement Maintenance, Evaluation and Strengthening.

CVE 569: Civil Engineering Seminar **2 Units**

Instruction on the preparation presentation and discussion of critical reviews of topics and projects of importance to the engineering profession in general and Civil Engineering in particular. Oral preparation and presentation of technical essays and project reports by students. Invited lectures on special topics in Civil Engineering. The special topics in Civil Engineering should include modern applications in the construction industry and environmental implications of Civil Engineering practices.

CVE 551: Civil Engineering Analysis and Design **2 Units**

Analysis and design of civil engineering projects from the viewpoint of the whole. Interactions between the individual components (subsystems) and the effects of such on the overall system. Optimal operation of the projects; as measured by stability, ease of operation, and economic returns. Systems management (operational research) techniques and applications in civil engineering, modelling, linear programming, dynamic programming PERT CPM in systems management. Transportation problems. Queuing theory and applications.

CVE 553: Building Technology **2 Units**

Construction planning and administration – cost control policies and procedures, incentives financial control. Network analysis. Arrow diagrams construction of a network, scheduling, time scales and project duration. Structure of the construction industry. Design and construction teams, statutory authorities, approval processes, notices etc. pre and post-contract planning; project evaluation tendering, site organization and coordination, productivity and resource management, fast tracking etc. operations research. Applications in construction management linear programme, sentencing, queuing theory and work study.

CVE 559: Fire Protection and Safety Engineering **2 Units**

Science and methodology of preserving lives and property by preventing or minimizing losses resulting from fires, explosions, accidents and other industrial hazards. Proper designs and use of building materials analysis of fire and explosion hazards. Safety design of industrial processes. Management of industrial loss control and insurance programmes. Safe design, selection and handling of equipment and materials.

CVE 563: Services Engineering **2 Units**

Building maintenance technology, including agencies causing decay and changes in appearance of building materials. Improvement of buildings management aspects. Sources of water and water treatment, and connection to main service pipe and supplies to buildings where the main is insufficient: Electrical supply and connection to resident and industrial buildings. Design of external drainage systems, sanitary appliances; sizing of waste and soil types. Refuse storage and disposal systems. Acoustics and ventilation systems of large, industrial and residential buildings. Maintenance services for roads, railway and airport facilities. Other basic engineering services provided for civil engineering facilities.

GNE 552: Engineering Economics and Valuation **2 Units**

Economics of business settings, costing of production systems. Objectives of cost analysis and control. Sources of finance, money and credit for projects. Investment Appraisals. Resource Allocation. Interest rates. Interest formulas and problems. Annual costs. Present worth, rates of return. Cost reducing. Depreciation accounting. Valuation of assets. Financial management; accounting methods, financial statement, elements of costing. Budget and budgeting control. Dwelling with multiple alternatives, uncertainties, planning, and Decision-making procedures. Macroeconomics, Economic growth, National Income. Economic of technological change. Economic analysis of engineering projects; value systems economic decisions on capital

investments and choice of engineering alternatives; new projects, replacement and abandonment policies, risky decisions; corporate financial practices. Analysis of tender and project feasibility valuation.

ELP 402: Projects and Impact of Technology on Industry II **2 Units**

In continuation, students will learn feasibility analysis by developing abilities to acknowledge the nuances and contexts which should inform their analysis and recommendation development on a project. Students will also learn different approaches to conducting rigorous feasibility analysis to prove/disprove recommendations. Students will hone their abilities to develop a logical, structured process from start to finish, particularly to maximize efficiency and productivity within an organization. Finally, students will be given time to work on the project during class time. They will also have different workshops/sessions available depending on the identified growth areas of their classes.

CVE 558: Construction Engineering **2 Units**

Basic principles relating to excavation, earthworks, and earth moving/construction equipment. Tunnel and basement construction. Vertical communication buildings, staircases, elevators, ramps, escalators systems building. Advance building structural systems, space frames, folded, plates, arches etc. construction materials, maintenance of civil engineering structures. Basic principles relating to maintenance, risk and safety. Reinforced concrete retaining walls: gravity, cantilever, counterfort, buttress and Diaphragm walls. Road pavement construction: subgrade, sub-base, base and wearing course. Bridges – types and suitability, methods of construction, use and construction of caissons and cofferdam in bridges. Airport construction – type's accessories such as run way, lighting, wind indicator and layout. Railway track, materials used and construction methods, rails, sleepers etc. Field trip.

CVE 568: Design of Structures III **2 Units**

Composite Design and construction in Steel and Reinforced Concrete. Design of Structural Foundations. Pre- stressed concrete Design. Modern Structural form. Tall Buildings, Lift shafts and shear walls, system buildings. Design projects.

CVE 560: Geotechnical Engineering II **3 Units**

Consolidation and settlement: One-dimensional consolidation. The odometer test. Primary and secondary consolidation. Immediate and consolidation settlements. Analysis of total and time rate of settlement. Settlement of spread and piled foundations. Shear strength of soils: General strength consideration. State of stress at a point and Mohr stress circle. Mohr-Coulomb theory of failure. Shear Tests: Vane shear test, direct shear test, triaxial test. Shear strength of saturated clays, shear strength of compacted unsaturated clays, sensitivity of soils, residual strength parameters. Slope stability: Types and mechanics of slope failures. Theoretical and graphical solution of slope stability problems. Short term and long term slope stability problems. Unsupported vertical cuts. Effects of tension cracks on slope stability.

CVE 562: Transportation Engineering**2 Units**

Geometric Design of highway, Traffic flow Theory, studies on intersection and interchanges, Parking Studies, Traffic Control Devices, Engineering and Operational characteristics of different modes of Transport: Train, buses, taxi, motor cycle, bicycle etc. Land, Sea and Air transportation characteristics. Introduction of current techniques in Transportation Planning including the development and use of mathematical models for trip generation, distribution, modal split and traffic assignment. Co-ordination of city planning and Transportation Engineering. Features of modern railways, subways, airfields and sea ports. Conjunctive use and coordination of various transportation systems.

CVE564: Advanced Soil Mechanics**2 Units**

Summary of common clay minerals. Clay mineralogy and clay water systems. Rate of consolidation. Accelerating consolidation with sand drains and surcharge. Shear strength of saturated clays. Stress paths. Shear strength of compacted unsaturated clays. Undrained vane shear test. Review of slope stability of circular slip surfaces. Slope stability of non-circular slip surfaces. Foundation subjected to dynamic forces. Maintenance; Avoiding failures in construction materials and foundation. Students will write and present in class a report on a given topic on Soil Mechanics and Foundation Engineering. Students will present a term paper using the most recent computer software for slope stability analysis.

CVE 566: Advanced Structural Engineering**2 Units**

Matrix methods of structural analysis: Flexibility and Stiffness methods, Derivation of flexibility and stiffness coefficients, Finite difference and finite element techniques. Derivation of computational molecules. Analysis of building frames subjected to lateral forces. Model analysis of structures using direct and indirect methods. Damped and un-damped dynamic response of structures to time dependent loadings. Forced and free vibrations of one-degree of freedom systems. Introduction to computational packages.

CVE 556: Environmental Engineering III**2 Units**

The work of the Sanitary Engineer. Water Supply, Treatment and Design. Waste Water Collection, Treatment, Disposal and Design. Solid waste Collection, treatment, disposal and design of systems. Air Pollution and Control.

CVE554: Building Maintenance**2 Units**

Building maintenance technology including agencies causing decay and changes in appearance of building materials, types of maintenance method, structural, survey on dwelling and schedule of dilapidation. Alterations, conversions extensions and improvement of buildings. Building maintenance management. Maintenance cycle and profiles, maintenance standards, statutory requirement. Planning maintenance work and cost control of maintenance operations. Organization of maintenance departments. Management aspects of building maintenance. Maintenance cycles – for different types of building. Standards expected of buildings –

deviations spots items. Planning maintenance – resources required. Programming execution, appraisal and policy guidelines. Maintenance of Estate roads, e.g. patching, redressing of road surface reconstruction of parts. Maintenance of electrical installation e.g. replacement of dead bulbs fluorescent tubes, generating plants, transformers, etc. maintenance of vertical transportation systems e.g. lifts, escalators, elevators, etc. maintenance of cooling systems e.g. air conditioners. Maintenance of plumbing works, septic tank, overhead and underground tanks.

CVE 552: Risk Management and Safety Engineering 2 Units

Pure risk and its effect on engineering, business and personal life. Recognition of risks and their associated loss potential as related to fire, safety, security and liability. Reduction or elimination of risk by protection systems or transfer to other entities. Assumption of risk after recognition, analysis and practical mitigation. Economic analysis and insurance involving natural disasters, fire accidents, and human activities failures, and losses.

CVE 592: Research Project II 3 Units

Final year students' individual or group projects in one of the several areas of Civil Engineering, under the supervision of the academic staff of the Department or School. These independent projects may involve literature research, design, elementary fabrication, and construction or feasibility studies. The student is required to plan and carry out the project under the supervision of academic member of staff. A formal report of the project is required at the end of the second semester. The student is required to present his/her results orally before a panel of examiners.

COURSE DESCRIPTION (OLD CURRICULUM)

GNE 415: Engineering Analysis 3 Units

Complex variables – advanced topics, differentiation and integration of complex functions. Cauchy – Riemann equations: Related theorems. Laplace and Fourier transforms – Applications. Introduction to non-linear differential equations – stability and Applications. Probability – elements of probability, density and distribution functions, moments, standard distribution, etc. Statistics – Regression and correlation – Large sampling theory. Test hypothesis and quality control.

CVE 401: Civil Engineering Practice 2 Units

Civil Engineering Work Standards and measurements. Contracts and sub-contracts. Works construction and supervision. Job planning and control – Programme Charts – Bar charts. Critical path methods, etc. Construction machinery and equipment. Applications/Case study-dams, foundations, bridges, highways, industrial buildings, sewage works.

CVE 403: Drainage and Irrigation Engineering 3 Units

Analysis and design of surface and combined drainage systems, collectors, storages and pumps. Methods of overflow protection of large areas. Analysis and design of irrigation systems. Soil-plan-water relationships. Water supplies, water delivery systems and water distribution systems.

CVE 405: Structural Analysis I**3 Units**

Indeterminate structural analysis: Energy and Virtual work Methods, Slope deflection and Moment distribution methods. Elastic Instability. Simple plastic theory of bending. Collapse loads. Stress-Grading of Timber, visual mechanical and electronic stress grading of Timber.

CVE 407: Design of Structures II**2 Units**

Limit state philosophy and Design in steel: Elastic and Plastic moment Designs. Design of Structural Elements in steel and connections and Joints. Limit state philosophy and design in Timber. Elastic methods and Design in Timber. Design of structural elements in Timber and Timber connectors. Laboratory Tests on Structural elements in Concrete, Timber and Steel. Computer Aided Design of structures

CVE 409: Elements of Foundation Engineering**3 Units**

Stresses in soils: Total and effective stress, pore pressure. Moduli of Elasticity, Poisson's ratio. Introduction to stress distribution in layered system from Boussinesq's theory, Westergaard theory. Earth retaining structures: Earth pressures (active, passive and at-rest pressures), earth pressure coefficients, Computation of earth pressure using the Rankine and the Coulomb wedge theories, and Culman's method. Earth pressures on retaining walls. Types and analysis of retaining walls. The use of bracings as lateral support in open cuts. Anchored bulkheads. Free earth support method of analysis. Bearing capacity: Ultimate, safe and allowable bearing capacities. Bearing capacity factor. Case of shallow and deep foundations. Factor of safety, shape effect, footings under eccentric and inclined loads. Foundation: Type and choice of foundations. Shallow and deep foundations, raft foundations and piles. Use and general characteristics of piles, piles and sand piles in clay, negative skin friction. Bearing capacity of pile groups. Eccentric vertical loads, dynamic pile driving formulas and efficiency of pile groups.

CVE 411: Highway Engineering I**3 Units**

Soil engineering aspects of highways: compaction, soil stabilization, soil classification and effect on usage, Methods of soil classification, Determination of California Bearing Ratio (CBR) and applications. Railways and Airfields. Highway geometrics and designs: Factors affecting highway route location. Factors affecting highway geometric design. Highway route location procedure, Generation of Base Map. Horizontal alignment design, Vertical alignment design, cross-sections. Classification of highways, Distinction between rural and urban roads.

CVE 402: Industrial Training Assessed by University Supervisors**4 Units**

This will be graded by staff and the grade would be used to compute the student's result.

CVE 404: Industrial Training Assessed by Industry-Based Supervisors**4 Units**

This will be graded by the industry based supervisors and the grade returned to the University for processing/ computing the student's result.

CVE 406: SIWES Seminar Presentation and Report 4 Units

Each student's report as well as the oral presentation of his or her report on work experience in the industry will be graded by the academic staff in the department. The marks obtained by the student will be used to compute his or her result.

CVE 413: Engineering Surveying and Photogrammetry II 3 Units

Further work on contours and contouring: Methods of contouring, contour interpolation and uses of contour plans and maps. Areas and Volumes. Setting out of Engineering Works. Elementary topographical surveying: Elements of photogrammetry, Photogrammetry equipment and Errors of Measurement.

GNE 501: Engineering Management 3 Units

Management of engineering project environment. Formation of company, sources of finance, money and credit. Insurance, National policies, GNP growth a rate and prediction. Organizational management. Management by objectives. Personnel management – selection, recruitment and training. Job evaluation. Industrial psychology- individual and group behaviour. The learning process, and motivation factors. Resources Management. Planning and decision making. Forecasting scheduling. Production control. Gantt chart. CPM and pert. Optimization methods. Transport and materials handling. Work study and production processes.

GNE 502: Engineering Economics 3 Units

Economics of business settings, Costing of production systems. Objectives of cost analysis and control. Sources of finance, money and credit for projects. Investment Appraisals. Resource Allocation. Interest rates. Interest formulas and problems. Annual costs. Present worth, rates of return. Cost reducing. Depreciation accounting. Valuation of assets. Financial management; accounting methods, financial statement, elements of costing. Budget and budgeting control. Dwelling with multiple alternatives and uncertainties, planning and decision making procedures. Macroeconomics, Economic growth, National Income. Economic of technological change.

CVE 505: Water Resources Engineering 2 Units

The Hydraulics of open channels and Wells. Drainage. Hydrograph Analysis. Reservoir and Flood-routing. Hydrological forecasting Hydraulic Structures, i.e. Dams, Dykes/Levees, Weirs, Docks and Harbours, Spillways, Stilling basins, Man Holes and Coastal Hydraulic Structures, etc. Engineering Economy in Water Resources Planning

CVE 507: Structural Analysis II 2 Units

Plastic Methods of Structural analysis. Matrix Methods of Structural analysis. Elastic Instability. Continuum of plane strain, elastic flat plates and torsion, solution by series, finite difference, finite element. Yield line Analysis and Strip methods for slabs.

CVE 509: Civil Engineering Seminar 2 Units

Instruction on the preparation presentation and discussion of critical reviews of topics and projects of importance to the engineering profession in general and Civil Engineering in

particular. Oral preparation and presentation of technical essays and project reports by students. Invited lectures on special topics in Civil Engineering. The special topics in Civil Engineering should include modern applications in the construction industry and environmental implications of Civil Engineering practices.

CVE 506: Basic Environmental Engineering 2 Units

The work of the Sanitary Engineer. Water Supply, Treatment and Design. Waste Water Collection, Treatment, Disposal and Design. Solid waste Collection, treatment, disposal and design of systems. Air Pollution and Control.

CVE 508: Design of Structures III 2 Units

Composite Design and construction in Steel and Reinforced Concrete. Design of Structural Foundations. Pre-stressed concrete Design. Modern Structural form. Tall Buildings, Lift shafts and shear walls, system buildings. Design projects.

CVE 510: Geotechnical Engineering II

3 Units

Consolidation and settlement: One-dimensional consolidation. The odometer test. Primary and secondary consolidation. Immediate and consolidation settlements. Analysis of total and time rate of settlement. Settlement of spread and piled foundations. Shear strength of soils: General strength consideration. State of stress at a point and Mohr stress circle. Mohr-Coulomb theory of failure. Shear Tests: Vane shear test, direct shear test, triaxial test. Shear strength of saturated clays, shear strength of compacted unsaturated clays, sensitivity of soils, residual strength parameters. Slope stability: Types and mechanics of slope failures. Theoretical and graphical solution of slope stability problems. Short term and long term slope stability problems. Unsupported vertical cuts. Effects of tension cracks on slope stability.

CVE 511: Civil Engineering, Measurements and Evaluation 2 Unit

Bill of quantities: price build up, work content and method statement. SMM specifications, resource rate etc. Types of building contracts: measurement and cost reimbursement contracts. Condition of contracts. Final accounts measurement, fixing of rates. Analysis of tender and evaluation of building projects, variation; interim certificates evaluation. The scope of civil engineering works and methods of measurement. Measurements involving site investigation, site clearance, excavation, dredging and filling, geotechnical processes. Earthworks, embankment and cuttings, retaining walls, Piling, road and railway works, bridges and culverts; and tunneling.

CVE 512: Transportation Engineering 2 Units

Design of intersection and interchanges, Parking, Geometric Design. Engineering and Operational characteristics of different modes of Transport; Train, buses, taxi, motor cycle, bicycle etc. Land, Sea and Air transportation characteristics. Introduction of current techniques in Transportation Planning including the development and use of mathematical models for trip generation, distribution, modal split and traffic assignment. Co-ordination of city planning and

Transportation Engineering. Features of modern railways, subways, airfields and sea ports. Conjunctive use and coordination of various transportation systems.

CVE 517: Highway Engineering II 2 Units

Highway Planning and Traffic Surveys. Pavement Design. Construction and maintenance. Administration and Finance of Highways. Pavement structure and design: Types of pavement, AASHTO Definitions. Methods of pavement design – British Method, French Method, Empirical design methods for developing countries (Road Note 31). Pavement materials and laboratory tests.

CVE524: Advanced Soil Mechanics 3 Units

Summary of common clay minerals. Clay mineralogy and clay water systems. Rate of consolidation. Accelerating consolidation with sand drains and surcharge. Shear strength of saturated clays. Stress paths. Shear strength of compacted unsaturated clays. Undrained vane shear test. Review of slope stability of circular slip surfaces. Slope stability of non-circular slip surfaces. Foundation subjected to dynamic forces. Maintenance; Avoiding failures in construction materials and foundation. Students will write and present in class a report on a given topic on Soil Mechanics and Foundation Engineering. Students will present a term paper using the most recent computer software for slope stability analysis.

CVE 526: Advanced Structural Engineering 3 Units

Matrix methods of structural analysis: Flexibility and Stiffness methods, Derivation of flexibility and stiffness coefficients, Finite difference and finite element techniques. Derivation of computational molecules. Analysis of building frames subjected to lateral forces. Model analysis of structures using direct and indirect methods. Damped and un-damped dynamic response of structures to time dependent loadings. Forced and free vibrations of one-degree of freedom systems. Introduction to computational packages.

CVE 527: Building Technology 3 Units

Construction planning and administration – cost control policies and procedures, incentives financial control. Network analysis. Arrow diagrams construction of a network, scheduling, time scales and project duration. **Structure of the construction industry**. Design and construction teams, statutory authorities, approval processes, notices etc. pre and post-contract planning; project evaluation tendering, site organization and coordination, productivity and resource management, fast tracking etc. operations research. Applications in construction management linear programme, sentencing, queuing theory and work study.

CVE 528: Construction Engineering 3 Units

Basic principles relating to excavation, earthworks, and earth moving/construction equipment. Tunnel and basement construction. Vertical communication buildings, staircases, elevators, ramps, escalators systems building. Advance building structural systems, space frames, folded,

plates, arches etc. construction materials, maintenance of civil engineering structures. Basic principles relating to maintenance, risk and safety. Reinforced concrete retaining walls: gravity, cantilever, counterfort, buttress and Diaphragm walls. Road pavement construction: subgrade, sub-base, base and wearing course. Bridges – types and suitability, methods of construction, use and construction of caissons and cofferdam in bridges. Airport construction – type's accessories such as run way, lighting, wind indicator and layout. Railway track, materials used and construction methods, rails, sleepers etc. Field trip.

CVE 531: Civil Engineering Analysis and Design 3 Units

Analysis and design of civil engineering projects from the viewpoint of the whole. Interactions between the individual components (subsystems) and the effects of such on the overall system. Optimal operation of the projects; as measured by stability, ease of operation, and economic returns. Systems management (operational research) techniques and applications in civil engineering, modelling, linear programming, dynamic programming PERT CPM in systems management. Transportation problems. Queuing theory and applications.

CVE 533: Fire Protection and Safety Engineering 3 Units

Science and methodology of preserving lives and property by preventing or minimizing losses resulting from fires, explosions, accidents and other industrial hazards. Proper designs and use of building materials analysis of fire and explosion hazards. Safety design of industrial processes. Management of industrial loss control and insurance programmes. Safe design, selection and handling of equipment and materials.

CVE534: Building Maintenance 3 Units

Building maintenance technology including agencies causing decay and changes in appearance of building materials, types of maintenance method, structural, survey on dwelling and schedule of dilapidation. Alterations, conversions extensions and improvement of buildings. Building maintenance management. Maintenance cycle and profiles, maintenance standards, statutory requirement. Planning maintenance work and cost control of maintenance operations. Organization of maintenance departments. Management aspects of building maintenance. Maintenance cycles – for different types of building. Standards expected of buildings – deviations spots items. Planning maintenance – resources required. Programming execution, appraisal and policy guidelines. Maintenance of Estate roads, e.g. patching, redressing of road surface reconstruction of parts. Maintenance of electrical installation e.g. replacement of dead bulbs fluorescent tubes, generating plants, transformers, etc. maintenance of vertical transportation systems e.g. lifts, escalators, elevators, etc. maintenance of cooling systems e.g. air conditioners. Maintenance of plumbing works, septic tank, overhead and underground tanks.

CVE 535: Services Engineering 3 Units

Building maintenance technology, including agencies causing decay and changes in appearance of building materials. Improvement of buildings management aspects. Sources of water and water treatment, and connection to main service pipe and supplies to buildings where the main is

insufficient: Electrical supply and connection to resident and industrial buildings. Design of external drainage systems, sanitary appliances; sizing of waste and soil types. Refuse storage and disposal systems. Acoustics and ventilation systems of large, industrial and residential buildings. Maintenance services for roads, railway and airport facilities. Other basic engineering services provided for civil engineering facilities.

CVE 536: Risk Management and Safety Engineering

3 Units

Pure risk and its effect on engineering, business and personal life. Recognition of risks and their associated loss potential as related to fire, safety, security and liability. Reduction or elimination of risk by protection systems or transfer to other entities. Assumption of risk after recognition, analysis and practical mitigation. Economic analysis and insurance involving natural disasters, fire accidents, and human activities failures, and losses.

CVE: 590 Project

6 Units

Final year students' individual or group projects in one of the several areas of Civil Engineering, under the supervision of the academic staff of the Department or School. These independent projects may involve literature research, design, elementary fabrication, and construction or feasibility studies. The student is required to plan and carry out the project under the supervision of academic member of staff. A formal report of the project is required at the end of the second semester. The student is required to present his/her results orally before a panel of examiners.

STAFF PROFILE



Engr. Dr. AKINRO O. Akinola

Senior Lecturer

B.Eng (Fuoye) Adv. Cert. in Water Mgt. (Hannover, Germany) M.Eng (Akure) M.Eng (Eksu) Ph.D (Akure)
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Engr. Dr. AKINRO Akinola Olusegun specialised in Soil, Water and Environmental Engineering. He holds a Higher National Diploma and Postgraduate Diploma in Civil Engineering, B. Eng (FUOYE), Advanced Certificate in Water Management from the Water and Energy Research Institute, Hannover, Germany; M.Eng in Soil and Water Engineering (FUTA, Akure), M.Eng Water and Environmental Engineering (EKSU, Ado Ekiti), MBA and Ph.D in Soil and Water Engineering from the Federal University of Technology, Akure. At different times, He had served as: Head of Department of Civil Engineering Technology, Rufus Giwa Polytechnic, Owo, Director of Works and Maintenance Services, Rufus Giwa Polytechnic, Owo (Nov 2011- Sept 2016 and Oct 2017 - Oct 2018), Director of Works and Services and member of the extended Management at Adekunle Ajasin University, Akungba-Akoko, Ondo State, (Oct 2016 – Sept 2017). He also served as Chairman and Member of various committees in both institutions. He was a Chief Lecturer at Rufus Giwa Polytechnic, Owo, Nigeria before his appointment as Senior Lecturer in Civil Engineering Department at Elizade University, Ilara-Mokin, Ondo State, Nigeria. He is a Registered Engineer with COREN and member of Nigerian Society of Engineers (NSE), Nigerian Institution of Water Engineers (NIWE), Nigerian Institution of Agricultural Engineers (NIAE), International Association of Engineers (IAENG)

among others. Dr. Akinro has contributed actively to several conferences, seminars and exhibitions. He had won several awards to his honour both locally and internationally. He has about twenty-six (26) publications in learned journals and conference proceedings.

Recent Publications

- i.* **Akinro A. O and Oni O. A.** (2022). An Evaluation of the Physical and Hydraulic Properties of the Soil Underlying the Municipal Solid Waste Dumpsite at Ilokun, Ado Ekiti, Nigeria. *Journal of Engineering, Technology and Innovation* Volume 1(1) pp. 25-30
- ii.* **Imoukhuede, O.B and Akinro A. A** (2021). Investigation into the Characteristic Strength of Mixture of Laterite and Cement. *Quest Journals, Journal of Architecture and Civil Engineering*, Vol.6(4) pp 1-6
- iii.* Falowo O.O and **Akinro A.O.** (2020). Hydrogeochemical Characterization and Groundwater Quality Assessment in Ore, Southwestern Nigeria. *International journal of Research Publication* (Volume 51(1) <http://ijrp.org/paper-detail/1081>).
- iv.* **Akinro A. O and Oni O. A.** (2020). Assessment of Municipal Solid Waste Leachate on Soil and Water Bodies at Ilokun Dumpsite in Ado Ekiti, Nigeria. *American Journal of Engineering Research (AJER)*, Volume-9, Issue-10, pp-52-56.



Engr. Prof. Philip G. Oguntunde

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Prof. Philip G. OGUNTUNDE, obtained a PhD in Environmental Hydrology and Water Engineering from the University of Bonn, Germany, in 2004 and joined the Department of Water Management, Faculty of Civil Engineering and Geosciences, Delft University of Technology (Netherlands) between November 2004 and December 2005 as a post-doctoral scientist. Dr Oguntunde is a registered Engineer with the Council for the Registration of Engineering in Nigeria (COREN), a member of Nigerian Society of Engineers (NSE), American Society of Civil Engineers (ASCE), International Association of Hydrological Sciences (IAHS) and a fellow of Nigerian Institution of Agricultural Engineers and Nigerian Institution of Water Engineers (NIWE). Dr Oguntunde has authored or co-authored over 100 scientific articles and technical papers including articles published in very learned international journals of high impact factors. He has taught many undergraduate and postgraduate courses in the area of soil, water and climate science. He has supervised and graduated many undergraduates and Postgraduate students including over 15 PhDs. He was appointed the first Associate Director in charge of Intellectual Property and Technology Transfer Office (IPTTO) and developed the IP Policy for FUTA. He serves as External examiner to many Universities within and outside the country. He has won many fellowships and grants which include: DAAD Scholarship in 2000; Water Research Center Grant at Netherlands in 2004; Partnership Grant from WOTRO, the Netherlands (2005), CERAD Research Grant in 2007, Alexander von Humboldt Fellow in Germany (2010-2013), Leibnitz Fellow (Germany, 2014-2018), BIARI Fellow (USA, 2011-2012); Fellow of the Galilee Institute (Israel, 2020) and Jerusalem Pilgrimage (JP) among others. He has served as consultant to many private and public organisations including the World Bank. He was Deputy Vice-Chancellor (Development) of the Federal University of Technology, Akure – the position he held between April 2018 and February 2023 before joining Elizade University in October 1st, 2023.

Recent Publications:

(i) Ogunrinde, A.T.; **Oguntunde, P.G.**; Akinwumiju, A.S.; Fasinmirin, J.T.; Olasehinde, D.A.; Pham, Q.B.; Linh, N.T.T.; Anh, D.T. (2022) Impact of Climate Change on Drought Attributes in Nigeria. *Atmosphere* 2022, 13 (11), 1874. <https://doi.org/10.3390/atmos13111874>.

(ii) Animashaun, I.M., **Oguntunde, P.G.**, Olubanjo, O.O. and Akinwumiju, A.S. (2023) Analysis of Variations and Trends of Temperature over Niger Central Hydrological Area, Nigeria, *Physics and Chemistry of the Earth, Parts A/B/C*, <https://doi.org/10.1016/j.pce.2023.103445>

(iii) Animashaun, I.M., **Oguntunde, P.G.**, Olubanjo, O.O. and Akinwumiju, A.S. (2023). Assessment of Climate Change Impacts on the Hydrological Response of a Watershed in the Savanna Region of Sub-Sahara Africa, *Theoretical and Applied Climatology*, DOI: 10.1007/s00704-023-04372-w (Springer)



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Recent Publications:

- (i) Oyewole O.T., **Akinmusere, O.K.**, Fasuba, O. A., Fakorede, E.O., Daramola, A.A., Akanni, A. O., Oke, I. O. (2024). A Systematic Hydraulic Analysis and Evaluation of the Epanet Software and Techniques on the Water Network of Elizade University. *FUDMA Journal of Science, Federal University, Dutsin -Ma*; 8(2):345-363.
- (ii) Fehintola E. O., Amoko, J. S., Demehin, A. I., Akanni, A. O., **Akinmusere. O. K.**, Oke, I. A. (2024). Adsorption Mechanisms and Structures of Arsenic Removal, *Science Forum (Journal of Pure and Applied Sciences, Faculty of Science ATBU, Bauchi)*.24:1-32
- (iii) Oke, I.A., Ojo, S.O., Olayanju, O.K, Akanni A. O, **Akinmusere O.K**; Fakorede E.O.; Fasuba, A.O., Oyewole, O.T; Abah, J.U. (2023). Performance Evaluation of Microsoft Excel Solver in The Pipe Network of An Open Loops; *Science Forum (Journal of Pure and Applied Sciences, ATBU, Bauchi)*; 23(23):735-772
- (iv) Fakorede E. O., **Akinmusere O. K.**, Babajide A. D., Bamgboye T. T. (2022). Efficacy and Effect of Selected Bio-cogulant on Treatment of Aponmu River. *LAUTECH Journal of Engineering and Technology*, 16(2):87-93
- (v) Adewumi, A., Lasisi, L. H., **Akinmusere, O. K.**, Ojo. A. O., Babatola, J.I. (2020). Comparative Study of Electrolysis-Enhanced Anaerobic Digestion of three Soluble Solid wastes for Biogas Production. *Indonesian Journal of Urban and Environmental Technology*, 4(1):11-28
- (vi) Temitope F. Ajibade, Nathaniel A.Nwogwu, Fidelis O. Ajibade, Bashir Adelodun, Temitope E. Idowu, Adedamola O. Ojo, Juliana O. Iji, Olabanji O. Olajire, **Oluwaseun K. Akinmusere** (2020). Potential dam sites selection using integrated techniques of remote sensing and GIS in Imo State, Southeastern, Nigeria: *Sustainable Water Resources Management, Springer Nature Switzerland*, 6(57):1-16
- (vii) **Akinmusere, O. K.**, Babatola, J. O., Lafe, O., Ajayi, O. E. (2019). Production of Methane from maize cob fed Termites: *Journal of Applied Science and Environmental Management*, 23(4):631-634



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Recent Publications:

- (i) **Ezemenike S.C** and Mohmammed H. (2017) Effect of polyethylene on the properties of hot mix asphalt concrete, Journal of Environmental design and management, vol 9. Pp 21-27
- (ii) **Ezemenike C**, Oyedepo O, Aderinlewo O, and Oladele O (2021). Performance of fly ash as replacement for non-renewable constituent, Journal of Civil engineering and urbanization, vol. 11, No 4, pp 25-33
- (iii) **Ezemenike C**, Oladele O, Aderinlewo O, and Oyedepo O (2021). Utililization of polypropylene in bituminous concrete, Journal of Engineering studies and research, Vol.27, No 4, pp 8-13

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- (v) **Ezemenike C**, Oyedepo O, Aderinlewo O, and Oladele O (2022). Performance of Steel slag as Constituent Material in Asphalt, Nigeria Journal of Engineering, Vol 29, No 1, pp 1-9
- (vi) **Ezemenike C**, Oyedepo O, Aderinlewo O and Oladele O, Omoniyi (2022). Rheological Characterization of Industrial Waste Modified Bitumen, Journal of Engineering Science, Vol XXIX, No 1, pp 126-135



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Recent Publications:

- (i) Oyewole O. T., Akinmusere O. K., Fasuba A. O., **Fakorede E. O.**, Daramola A. A., Akanni A. O., and Oke I. A. (2024). A Systematic Hydraulic Analysis and

Evaluation of the Epanet Software and Techniques on the Water Network of Elizade University. *FUDMA Journal of Sciences*, 8(2), 345 – 363

- (ii) **Fakorede E.O. (2021)**. Electro-coagulation Treatment Method to Remove Heavy Metals from Synthetic Wastewater. *Journal of Water Resource Research and Development* Volume 4 Issue 1, page 1-8.
- (iii) **Fakorede E.O. & Adewumi J.R., (2020)**. Effectiveness Of Electro-Coagulation Treatment Method on The Physio-Chemical Parameters and Heavy Metals in Rubber Latex Wastewater. *Journal of Engineering and Technology (LAUJET)* (14) 2, 1-9
- (iv) **Fakorede, E.O., Ikumapayi C.M., Adeniji, A.A., and Adanikin., A. (2019)**. The effect of curing media on compressive strength of microbial laterite concrete. *American Scientific Research Journal for Engineering, Technology, Science*, 61(1), 92-102.
- (v) Ikumapayi C.M, & **Fakorede, E.O.** (2019). Quality Assurance of Available Portland Cements in Nigeria. *International Journal of World Policy and Development Studies*, (5)6, 53-63.



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Recent Publications:

- (i) **Ajayi J.A.**, Gana A.J., Adanikin A. and Busari A. (2023). Mitigation of Alkali- silica reactions in Concrete Pavements using Supplementary Cementitious *Materials. Materials today: proceedings*, 86, 59-66. <https://doi.org/10.1016/j.matpr.2023.02.257>.
- (ii) Adanikin A., **Ajayi J.A**, Akande O., & Aremu- Cole E. A (2022). Spatial Analysis of Road Pavement Condition and Maintenance Actions using GIS. *Nigerian Journal of Engineering Science Research (NIJESR)*, 5(1), 76-86.
- (iii) Adanikin A., Adeoye I. & **Ajayi J.A** (2022). Analysis of railway commuting factors and customers patronage in Lagos State, Nigeria. *Journal of sustainable Development of Transport and Logistics*, 7(1), 90-98.
- (iv) **Ajayi J.A**, Gana A.B, Adanikin A, Ogedengbe K. Abundance I. (2022). Enhancement of Mechanical Properties of Concrete using microwave Cured bamboo Composites. *Archives of Civil Engineering*, 68(3), 553-567.
- (v) Adanikin A., **Ajayi J.A**, Busari A, Fakorede E, Fase T. (2021). Evaluation of cow bone ash (CBA) as additives in stabilization of lateritic and termitaria soil. *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)*, 80(1), 136-144.
- (vi) Austin, O. O., Alonge, O., & **Ajayi. J.A**, (2020). Fault Diagnosis Algorithm and Protection of Electric Power Systems in an Alternative Distribution System. *Journal La Multiapp*, 1(3), 8-16.
- (vii) Adanikin, A., Oyedepo, O. J, **Ajayi, J. A**, Agbetanmije, K. (2019). Laboratory study of the use of alternative Materials as fillers in Asphaltic Concretes *International Journal of Scientific Research Engineering & Technology (IJSRET)*, 8(6), 249- 261.
- (viii) Ikumapayi C. M., Adeniji A. A., Obisesan A. A., Odeyemi O., **Ajayi J. A.** (2019). Effects of Carbonation on the Properties of Concrete. *Academic Research Publishing Group, Scientific Review*, 5(12), 205-214.



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He has experience in quality control of Civil Engineering materials and construction processes. He worked directly with the Geotechnical and Geoenvironmental section of Civil Engineering Department, FUTA as a teaching and research assistant from January, 2018 until November, 2021. Together with the team members, he engaged in sub-surface soil investigations for foundation designs. He is presently an academic staff of the Elizade University, Ilara-Mokin.

His research interest covers environmental protection (with emphasis on waste containment barrier evaluation and the protection of groundwater resources from contaminations arising from improper waste disposal), sustainable infrastructure provisions and the application of computational intelligence (Artificial Neural Networks) in the prediction of soil hydraulic conductivity. One of his recent papers titled, "*Predictive modelling of soils' hydraulic conductivity using artificial neural network and multiple linear regression*" published in SN APPLIED SCIENCES is profoundly impressive. This paper has availed him opportunity of being invited as one of the speakers in many international conferences relating to Artificial Intelligence, Big Data Analysis and Data Mining. Furthermore, this journal was indexed in the Web of Science Core Collection. He is currently working on Geoenvironmental related research with wonderful ability to collaborate in multidisciplinary research.

Recent Publications:

1. **Williams, C. G.** and Ojuri, O. O. (2021). Predictive Modelling of Soils' Hydraulic Conductivity Using Artificial Neural Network and Multiple Linear Regression. SN Applied Sciences, 3(2), 1-13. <http://doi.org/10.1007/s42452-020-03974-7>. (**Web of Science Core Collection indexed**)
2. Olabanji, T. O., Ojo, O. M., Adewuyi, A. S. and **Williams, C. G.** (2021). Evaluation Of Delonix Regia Seeds as A Natural Coagulant in The Treatment of Low Turbid Water. *FUTA Journal of Engineering and Engineering Technology*, 15(2), pp. 267-272.



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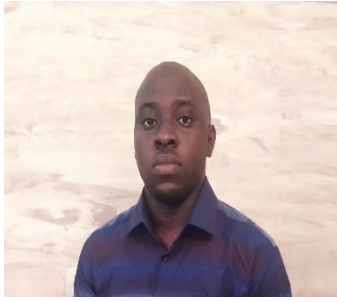
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Publications:

- (i) Oyewole O. T., Akinmusere O. K., **Fasuba A. O.**, Fakorede E. O., Daramola A. A., Akanni A. O., and Oke I. A. (2024). A Systematic Hydraulic Analysis and Evaluation of the Epanet Software and Techniques on the Water Network of Elizade University. *FUDMA Journal of Sciences*, 8(2), 345 – 363.
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- (iii) Oke I., Ojo S., Olayanju O., Fakorede E.O., **Fasuba A.**, and Daramola A. (2023). Utilization of Epanet for the Design of Institutional Pipe Network. *Journal of Pure and Applied Sciences*, 23, 570 – 584.
- (iv) Ajayi J., Adanikin A., Faleye E. and **A. Fasuba** and Oshin (2022). Durability Evaluation of Concrete Containing Cassava Peel Ash Using Electrical Resistivity. Conference paper.