FACULTY OF ENGINEERING HANDBOOK

(2014 - 2019)

COLLEGE OF ENGINEERING AND ENVIRONMENTAL STUDIES

OLABISI ONABANJO UNIVERSITY
PMB 2002 AGO-IWOYE
OGUN STATE NIGERIA

(www.oouagoiwoye.edu.ng)

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Students' Organisations

The University, and hence the Faculty, encourage active, mutual and cordial relationships among its students through the formation of professional associations, cultural and religious societies, and social and recreational organizations. Such recognized organizations abound all over the University premises. In the Faculty of Engineering, functional associations are:

(1) Nigerian Universities Engineering Students Association (NUESA)
(2) Agricultural Engineering Students' Association

(3) Computer Engineering Students' Association of Nigeria
(4) Electrical/Electronics Engineering Students' Association of Nigeria
(5) Association of Mechanical Engineering Students (AMES)

HISTORY OF THE COLLEGE OF ENGINEERING AND ENVIRONMENTAL STUDIES

In 1984, the then State Military Administration, on purely economic grounds, suspended the multi-campus University to a single campus institution at Ago-Iwoye but had to keep the College of Health Sciences at Sagamu for operational reasons. In 1990, the multi-campus system was resuscitated with the opening up of the Ibogun Campus on 24th July 1990 while the faculty of Liberal Arts is to be at Ayetoro and not College of Agricultural Sciences. However, in November 2003 the College of Engineering and Technology (Ibogun Campus) was formally commissioned by the Ogun State Government. College of Agricultural Sciences (Ayetoro) was also commissioned the same year.

When in the 2003/2004 academic session, the Olabisi Onabanjo University College of Engineering and Technology, Ibogun Campus, became fully operational, it was the realization of a long awaited dream, a fulfillment of passionate desires and product of undying faith and relentless struggles as well as a culmination and consummation of a vision that once seemed unrealizable having suffered numerous frustrations and set-backs in the past. The history of the College is not different from the history of any project that is destined to be great; the road would necessarily be tortuous and arduous.

It is needless to say that a strong engineering and technological education has always been identified as a catalyst for national development. Ogun State, which prides itself as the "gateway" to Nigeria, has, since its creation, placed a high premium on the acquisition of technological education. When in 1982 the dream to establish Olabisi Onabanjo University became a reality, a College of Engineering and Technology was part of the grand plan.

In line with its multi-campus orientation, this College was to be situated in the Egba Zone, specifically, Ibogun-Olaogun, the traditional home of former Head of State and former President, Chief Olusegun Obasanjo. Unfortunately, certain unfavourable developments prevented the College from immediately seeing the light of day.

Citing financial constraints, Col. Oladipo Diya, then Military Governor of Ogun State, in 1984 not only collapsed all the Campuses into one, he seemed to favour a policy that would put an end to a multi-campus system. That fiat and the implicit policy of a uni-campus system could reasonably be interpreted as having put paid to an idea of Ibogun or any other campus for that matter. At any rate, the planned College temporarily suffered a reverse, and another effort aimed at resuscitating the multi-campus system with the opening up of Ibogun Campus on July 24, 1990 proved futile.

However, as the saying goes, "nothing succeeds as an idea whose time has come". Towards the end of tenure of Prof. Yinusa Oyeneye, the third Vice Chancellor of the University in 1998/99, arrangements reached a very advanced stage to revive the multi-campus dream. This was followed by the setting up of bodies known as University and Concerned People's Communities to mobilize funds for the commencement of operation of the campus. Consequently, admission was conducted during this session for the Ibogun campus with an initial enrolment of 90 students. This was in anticipation of government's readiness to commit funds to the project. The idea was again deferred owing to government's non-readiness.

The community-driven development of the College of Engineering and Technology Campus, Ibogun, was master-minded by eminent sons and daughters of Egba. The members were: Prof. A. B. Ejiwunmi, [a former Deputy Vice Chancellor of the University] and Chairman. Others are, Late Mr. I. O. Sanyaolu

[Secretary], Chief [Mrs.] Kikelomo Delana [Member], Mrs. Oluomo [Member], Chief N. O. Sotoyinbo [Foundation Registrar] [Member] Engineer Olabode and others.

Working in tandern with this Committee was another one constituted by the University to provide logistics for the smooth commencement of operation of the Campus. The University's Committee membership included:

(i)	Prof. A. B. Ejiwunmi - OACHS	Chairman
(ii)	Prof. R. O. Fagbenle - [Pioneer Provost of the College]	Member
(iii)	Prof. J.O. Akinyemi - Coordinator of the College	Member
(iv)	Prof. R. A. Salau - UNILAG	Member
(v)	Prince Bode Ladejobi	Member
(vi)	Dr. Kola Odunnaike – Rep. Fac. of Sc.	Member
(vii)	Prof. V. O. S. Olunloyo - UNILAG	Member
(viii)	Mrs. Osunsanya – Rep. Academic Affairs Office	Member
(ix)	Mr. R. A. Koleade – Rep. Ministry of Education	Member
(x)	Mr. N. O. Adenopo – Rep. of Bureau of Mgt & Budget	Member
(xi)	Engr. O. O. Ogunsolu – Rep. of Min. of Works	Member
(xii)	Mr. M. S. Adetunji - College Secretary	Member
(xiii)	Mr. A. J. Oribayo - Registry	Secretary

ADMISSION REQUIREMENTS & REGULATIONS GOVERNING THE B.Sc. DEGREE PROGRAMMES IN THE FACULTY OF ENGINEERING

(A) ADMISSION REQUIREMENTS

1 UME Candidates

The minimum admission requirements shall be passes at credit level in the Senior Secondary School final year examination or GCE 'O' Level in five subjects including Mathematics, Physics, Chemistry, one other science subject and English Language. UME subjects shall be Use of English, Mathematics, Physics and Chemistry.

2 Direct Entry

(i) Candidates must have passes in Mathematics, Physics and Chemistry at GCE 'A' Level or equivalent in addition to UME entry requirement.

(ii) Candidates with OND may be admitted into 200-Level courses while candidates with HND may be admitted into 300-Level courses. In addition such candidate must also satisfy the UME entry requirement.

(iii) Holders of satisfactory grade point in the Degree Foundation Programme (DFP) of the College of Engineering and Technology, OOU may be admitted into 200-Level having satisfied the UME entry requirement.

3 Transfers and Other Cases

(i) Students can transfer into either 200 or 300-Level in the department provided they have the relevant qualifications.

(ii) Candidates from recognized institutions may be allowed to transfer to 200 or 300-Level provided they possess the relevant qualifications. Each case shall be considered on its own merit.

(B) REGULATIONS GOVERNING THE DEGREE PROGRAMMES IN THE FACULTY

1. Programmes of study shall be provided leading to a Bachelor's degree in Engineering to be denoted by;

   (i) B. Sc. Agricultural Engineering
   (ii) B. Sc. Computer Engineering
   (iii) B. Sc. Electrical & Electronics Engineering
   (iv) B. Sc. Mechanical Engineering

2. Instruction shall be by courses and students will be required to take an approved combination of courses and undergo appropriate work experience as Senate, on the recommendation of the Board of the Faculty, may from time to time determine.

3. Courses shall be evaluated in terms of course units. One unit represents one hour of lecture or, one-hour tutorial or 3 hours of laboratory / practical work per week throughout a semester or an equivalent amount of other assigned study or practical experience or any combination of these. All courses shall run for one semester or a full session of two semesters.

4. There shall be five levels of courses including the foundation year course. Course number shall be prefixed by a three-character code.

5. **The course symbol in the Faculty shall be:**

   FEG - Faculty of Engineering general courses
   AEG - Agricultural Engineering Courses

CPE - Computer Engineering Courses
EEG - Electrical/Electronics Engineering
MEG - Mechanical Engineering Courses

6. **Requirements for the Award of Degree:**

To be eligible for the award of Bachelor of Science (Honours) degree in the Faculty, a candidate must pass a prescribed minimum number of course units from each of the groups below:

Summary of the Curriculum:

(i) Compulsory Courses:
- (a) University Requirement
- (b) General Studies
- (c) Computer Studies
- (d) Faculty / Departmental Requirement

(ii) Electives (a) Restricted Electives (b) Free Electives

7. **Regulations on Course Selection:**

Students are required to take a list of approved courses recommended for the semester and register for not less than 12 and not more than 24 units in each semester. Students are however not normally permitted to register more than 48 units in any one session.

8. **Registration for Courses:**

(i) Before registering for a course, the student must meet the pre-requisites/co-requisites or equivalent courses as prescribed for that course.

(ii) Each student must complete registration for each semester within the period prescribed for registration.

(iii) Any addition to or reduction in the courses for which a student is formally registered must be made with the consent of the student's adviser and Head of Department, Such alterations must be effected within three weeks from the commencement of the registration period and on the prescribed 'Add and Delete Form'

9. **Probation and Withdrawal:**

A student whose cumulative Grade Point Average (CGPA) is below 1.00 at the end of a particular semester shall be allowed a period of probation for the next semester. If at the end of the probation period, the student's CGPA is still below 1.00, then such student shall be advised to withdraw from the Department.

10. **Final Assessment**

The overall performance of candidates in all examinations may be moderated in such a manner, as Senate may determine, by assessors appointed by Senate from outside the University in accordance with the general regulation relating to the duties of the External Examiner. The class of the degree shall be awarded on the basis of the final grade point average as follows:

4.50	-	5.00	First Class Honours
3.50	-	4.49	Second Class Honours (Upper Division)
2.50	-	3.49	Second Class Honours (Lower Division)
1.50	-	2.49	Third Class Honours
1.00	-	1.49	Pass

11. **Students' Welfare**

(I) **Handling of Academic Grievances:**

There are two ways in which students can channel their academic grievances viz; via the staff adviser or directly to the Head of department. Depending on the nature of grievance, the adviser may or may not forward the complaint to the Head of department. However, such records and actions taken are documented in the student's personal file in the department for easy reference. Serious cases may be referred to the Dean/Provost and sometimes to the Faculty/College Board Committee on discipline.

(ii) **Student Academic Advising:**

Each level of students in the department is attached to an academic adviser. The major functions of the staff advisers are guidance and counseling. This will assist in spotting out weak students for early guidance.

(iii) **Academic Atmosphere:**

To maintain conducive atmosphere for exchange of ideas and interaction amongst students, the Faculty of Engineering students have inaugurated student association, called Nigerian Universities Engineering Students Association (NUESA), which is a branch of the National body Engineering Students. This association serves as a blanket association for all departmental students' associations. Departmental Associations also exist. These associations have as members, all students of the particular department, Lecturers as staff advisers and the Head of department, Dean of the Faculty of Engineering and Provost of the College as patrons.

These associations, on annual basis, are expected to organize Engineering Exhibitions, Public Lectures, Debates, Sporting competitions and Industrial Visits, which will contribute immensely to the development and exposure of the students.

EXAMINATION PROCEDURES AND REGULATIONS

For examinations and determination and classification of examination results, the following procedures and guidelines are used.

(1) The time allowed for written examination shall normally be on the basis of not less than HALF-hour and not more than ONE-hour for each one unit course. In any case, the time allowed for any one theory paper shall not exceed 3 hours.

(2) Not more than one course shall be examined in one paper.

(3) Other forms of examinations may include practical examinations, inspection and assessment of practical work, note-work, project work, special reports, work experience reports, work dairy, or any other activity as provided by Senate on the recommendation of the Faculty Board.

(4) In addition to written examinations at the end of the courses, courses may also be examined where possible by continuous assessment through assignments and/or periodic tests.

(5) The External Examiners shall participate in the conduct of 500 level examinations, and the determination of the overall results in accordance with the general regulations relating to the duties of External Examiners.

(6) All courses shall be graded out of a maximum of 100 marks and the pass mark shall be 40.

(7) The Head of Department, who is the Chief Examiner for departmental courses, shall, after receiving the mark-sheet of a course examination from the Examiner, convene a Departmental Board of Examiners' meeting to ratify the results.

(8) The Dean of the Faculty is the Chief Examiner for Faculty-based (FEG) courses.

(9) The Faculty Board of Examiners' meeting shall be held to consider Master Marks Sheet and Results Summaries for each Semester.

(10) At the end of every academic year each student shall be issued with the first and second semester results.

REGULATIONS GOVERNING THE CONDUCT OF EXAMINATIONS

1. Candidates must attend punctually at the times assigned to their papers, and must be ready to be admitted into the examination hall twenty minutes before the time the examination is due to start. Candidates arriving more than half an hour after the Examination has started shall be admitted only at the discretion of the Chief Invigilator.
2. Except with the special permission of the Chief Invigilator, candidates may not leave the examination hall during the first and the last half hour of the examination. Outside these periods, candidates with the permission of the Invigilator, may leave the room temporarily, and then only if accompanied by an attendant.
3. Candidates must bring with them to the examination hall ONLY their writing materials and any materials, which may be permitted by the examiner.
4. While the examination is in progress, communication between candidates is strictly forbidden, and any candidates found to be giving or receiving irregular assistance may be required to withdraw from the examination and / or penalized after.
5. Silence must be observed in the Examination Hall. The only permissible way of attracting the attention of the Invigilator is by the candidate raising his hand.
6. Candidates are not allowed to smoke in the Examination Hall.
7. Candidates are informed that medical attention can be obtained if necessary.
8. The use of scrap paper is not permitted. All rough work must be done in the answer books and crossed neatly through. Supplementary answer books even if they contain only rough work, must be tied inside the main answer book.
9. The answer to each question must be started on a separate sheet of paper.
10. Before handling in their scripts at the end of the examination, candidates must satisfy themselves that they have inserted at the appropriate place their matriculation numbers and the numbers of the questions they answered.
11. It will be the responsibility of each candidate to hand in his script to the Invigilator before he leaves the hall. Except for the question paper and any materials they may have brought with them, candidates are not allowed to remove or mutilate any paper or material supplied by the University.
12. Candidates will only be allowed into the examination hall upon presentation of both the University and Faculty of Engineering Identification Cards

University Teaching and Examination Regulations

(i) The Harmattan and Rain Semesters Teaching Time-Table shall be made available to students at the beginning of each Semester to guide them in selecting courses, particularly electives, for which they can register. The Harmattan and Rain Semester examinations' Time-Tables, however, shall be made available to students at least two weeks before the commencement of each examination.

(ii) The Senate shall have control and general direction of all university examinations and shall exercise such powers as may be necessary to discharge these functions.

(iii) Senate shall be responsible for the details of organization and the administrative arrangements for University examinations. It shall set up a sub-committee on Examinations to assist it in the performance of these functions. The Registrar or his nominee shall be the secretary to the sub-committee.

(iv) Subject to the overriding control of Senate exercised through the Senate Committee on Examinations as in (iii) above, University examinations shall be conducted by Departmental Boards of Examiners appointed by Senate on the recommendations of the appropriate College/Faculty Boards.

(v) Senate shall determine whether any matter is one of the conducts of examinations or of the organization and arrangement for examinations.

Board of Examiners

The Board of Examiners of a Faculty shall be constituted as follows:
The Dean of the Faculty as Chairman
The Heads of Departments and all other University approved Examiners in the Faculty where applicable, the relevant External Examiners.

The functions of the Board of Examiners of a Faculty shall be:

(i) to consider and ratify the marks, and in final examinations, the classifications recommended by the Department Board of Examiners in respect of graduating students:

(ii) to make recommendations to the Faculty Board for the consideration of all Semester Examination Results and the award of degrees, diplomas and certificates;

(iii) to consider all cases of absence or withdrawal from examinations and to make recommendations to the Faculty Board;

(iv) to make recommendations to the Faculty Board for the award of distinctions and prizes.

The Departmental Board of Examiners shall be constituted as follows:
The Chief Examiner (Chairman)
The External Examiner(s) where applicable
All the University Examiners in each paper.

The functions of the Departmental Board of Examiners shall be:

i. The moderation of all examination questions;
ii. To consider the marks allotted to candidate for individual course
iii. To make recommendation to the Faculty Board of Examiners

Pattern of Examination

(i) Each course shall be examined at the end of the course The Examination shall be conducted as prescribed by Senate.

(ii) Each course will normally be examined by a theory paper of 1-3 hours in addition to which there may be a practical and/or an oral examination.

Measurement of Performance

Performance in a course shall be measured in terms of:
(a) The results of prescribed theory and practical examination and/or
(b) assessment of essays, practical exercise and reports prescribed for each course

Level of Performance

(i) First Degrees And Diploma

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

Letter Grade	Grade Point	Mark
A	70-100%	5
B	60-69%	4
C	50-59%	3
D	45-49%	2
E	40-44%	1
F	0- 39%	0

(ii) First Degrees

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 below:

First class	4.50-5.00
Second Class upper Division	3.50-4.49
Second Class Lower Division	2.40-3.49
Third Class	1.50-2.39
Pass	1.00-1.49

(b) **Diplomas**

(i) A candidate who has satisfactorily completed all requirements for Diploma with an ~I Grade Point Average of not less than 1.00 shall be awarded the Diploma as indicated below:

4.50 and above	-	Distinction
3.50. 4.49	-	Credit
2.40. 3.49	-	Merit
1.00. 2.39	-	Pass
Below 1.00	-	Fail

(ii) A candidate who scores a cumulative Grade Point Average (CGPA) of less than 1.00 in two consecutive Semesters would be required to withdraw from the University.

Assessment and Awards

The final award and the class of 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 course units registered for during the course of the student's programme. The only exception is the College of Health Sciences and the Faculty of Law where courses are not graded on course unit basis. In the case of the College of Agricultural Sciences, however, only 200. 300, 400 and 500 level courses shall be considered in the determination of the final class of degree of students.

(a) Procedure for the Preparation, Return and Approval of Examination Results

(i) No examination Result is a true result of the College/Faculty until it has gone through the College/Faculty Board.

(ii) Co-ordinators of subjects shall sign the examination results being submitted to Heads of Departments.

(iii) The examination results prepared by each Department shall be considered by the Department's Board of Examiners and signed by the Head of Department.

(iv) Signed copies of each Department's examination results shall be turned over to the Provost's/Dean's Office for the consideration of the College/Faculty Board of Examiners and appropriate recommendation.

(v) No Faculty examination result shall be altered except with the written consent of the Provost/Dean.

(vi) At levels where External Examiners are required, the written consent of the External 'Examiners shall be attached to the result being amended.

(vii) The examination, results of graduating students shall always be presented for the consideration and approval of Senate

(b) Release of Examination Results:

(i) The Results of examinations taken in the University shall be compiled in the format approved by Senate, and shall include candidate's identification number, names and the Individual course results.

(ii) On the approval of the examination results by College/Faculty Board, provisional results shall be released by the Faculty Office and pasted on College/Faculty Notice Boards.

(iii) Results of examinations shall be released course by course stating, candidates matriculation number, mark scored in each course and appropriate letter grade.

(iv) Names and numbers of failed candidates shall not be included in the results pasted on Notice Boards.

(v) All amended results executively approved by the Vice-Chancellor shall come before the Senate for ratification.

(vi) On the approval of the results by the Senate, the Academic Office shall release individual results to candidates at the end of the each Session. .

Cases of Examination Misconduct

The following offences shall carry the following punishments;

(a)(i) Student caught with prepared answer scripts – Two Semesters Suspension;

(ii) Those who aid and abet such offences should face similar punishment;

(iii) Any staff involved, should face Staff Professional and Ethic Committee of the University.

(b) Impersonation: Any student found guilty of the offence shall face:

(i) Four Semesters Suspension both the principal offender and the student concerned.

(ii) In case they are not students of the University, they should be handed over to SSS/Police for criminal charges;

(iii) If a graduate of the University is involved the certificate shall be withdrawn from him/her.

(c.) Exchange of Answer Scripts: Such students involved shall be suspended for Two Semesters each.

(d.) Use of Micro-Chips, Hand Phones or other Incriminating Material during Examination; such students found guilty shall face Two Semesters of Suspension.

(e.) Altering of Matriculation Numbers, Falsifying of Matric. Number During or After Examinations; any student found guilty shall be suspended for a period between Two-Four Semesters.

(f.) Refusal to Complete Form – Irregularity Form: Any student found guilty shall be given two semesters of suspension; Any staff that covers up such offence shall face the Staff Professional and Ethics Committee.

Spying: During Examinations

Any student found guilty of the offence shall have the paper canceled.

If the answers are the same, the student found guilty should face ONE SEMESTER Suspension in addition to cancellation of the paper.

Only qualified invigilators shall be allowed to handle examination misconduct issues.

Any student that was found guilty of rudeness to an invigilator shall face ONE SEMESTER SUSPENSION.

Any lecturer whose questions got leaked must be made to face necessary disciplinary action.

Registration of Students Unable to Graduate Due to some Outstanding Courses

At the commencement of the session, a student shall through his/her Provost/Dean seek a general waiver of the regulations relating to minimum course load of full time studentship if he/she is unable to graduate because of one or two outstanding course. Such a student needs not carry minimum full-time studentship load. In cases where the courses are few and the circumstances permit, the students may register for only one Semester for which he will pay fees on pro-rata basis.

Student Industrial Work Experience Scheme (SIWES) Unit

The students in the Faculties of Science, Management Sciences, Arts and Education, Colleges Agricultural Sciences, Engineering and Environmental Studies, are to be involved in a Cooperative Education Programme which is a requirement and also an exposure to relevant, live on-location or on-job work experience. This is usually referred to as the Student Industrial Work Experience Scheme (SIWES). The arrangement is such that students between 100 and 300 levels, or between 200 and 400 levels, depending on the specific programmes, shall spend a total of 3 - 12 months in an approved Industry. SIWES carries a maximum of 6 units depending on programmes and is a compulsory course. It is designed to make them acquire the necessary practical skills to complement the theoretical exposure in the university. It is therefore one of the requirements for registration of professional programmes by the relevant professional bodies. Our Students shall participate in the scheme as stipulated in their various departmental programmes from the second year of their registration in the university. There shall exist a

SIWES Unit in the university that shall perform the following functions:

i) Coordination, administration and overall management of industrial training programmes of students of the University;
ii) Liaison with industries, government establishments and relevant parastatals (National Universities Commission and the Industrial Training Fund) in the operation of the Scheme;
iii) Securing job placements for students, industrial training follow-up activities, industrial training supervision and allied functions; and

Providing necessary information to students, departments and colleges on industrial training matters and advising them on manpower development needs of industries.

INDUSTRIAL TRAINING FOR ENGINEERING STUDENTS

The Faculty runs Classroom/Laboratory – Industry balanced Programme in which students are exposed to relevant productive work in the industries as an integral part of their academic work in the University. This is usually referred to as Student Industrial Work Experience Scheme (SIWES). A miniature of this, carried out on the Campus or in close vicinity of the College during long vacations is referred to as Students' Works Experience Programme (SWEP).

DUTIES OF THE INDUSTRIAL TRAINING COORDINATING UNIT

(i) Soliciting Co-operative placements (jobs) in business, Industry, government or service agencies depending upon the needs and qualifications of the student and placing students on such training assignments after analyzing the technical contents.
(ii) Coordinating and supervising the Co-operative employment of students in such a way that students have the opportunity of learning useful engineering and technological skills on real jobs and under actual working conditions.

(iii) Conducting follow-up activities regarding all placements by checking regularly each student's job performance through company visits and individual student interview.
(iv) Providing necessary advice to students as to the relevance of their chosen field to the industrial requirements of the country.
(v) Organising and conducting students' seminars on work reports.
(vi) Liaison with Main University (Ago-Iwoye) IT Unit, NUC, ITF, other agencies and industries on student industrial training programme of the University.

INDUSTRIAL TRAINING SCHEDULE

The arrangement of industrial training is such that 200 level students of the Faculty go on 2 months industrial training, 300 level students go on 3 months industrial training while 400 level students go on 6 months training. Therefore a period of 11 months is spent in the industry during the five-year undergraduate programme in the Faculty. The schedule of training is given on the table below:

LEVEL	COURSE	DURATION	UNITS
200	FEG209	8 Weeks	0
300	FEG309	8-12 Weeks	0
400	FEG409	24 Weeks	6

Assessment of Industrial Training as a course involves the following:
(i) Working successfully in the industry for the special period.
(ii) Submitting of a work report to the Industrial Training Unit at the end of the training period.
(iii) Giving of Seminar on the industrial training experience.

It must be noted that industrial training is an integral part of Engineering and Technology education. ***Without completing the Industrial Training Programme successfully, affected students of the Faculty will NOT graduate***

Work-Study Programme

The Directorate initiated the Work-Study programme to financially support students who are willing to do few hours of job from their leisure period. It is intended to consolidate their financial strength while in the University.
Appointed students on the work-study programme usually serve at various levels/units of the University namely:

- Security-Intelligence/Monitoring work
- University Library
- Science Laboratories
- Health Centre
- Work and Services (Cleaning, Horticulture, Transport etc.)

No students appointed would do more than 6 hours in a week and a maximum of 24 hours in a month.
The highest a student on Work-Study Programme can take in a month is N9,600.00 which is an average of N400.00 per hour.
There had been beneficiaries of this scheme since 2010 and it is hoped to continue till 2020when other superior methodologies are developed to cater for the students' needs and welfare.

FOUNDATION YEAR COURSE

The Foundation Year courses are designed to expose all students of the College of Engineering and Environmental Studies to sufficient basic sciences needed as a solid foundation to pursuance of degree programmes in the College. A few universities required general courses (GNS) are also included. The courses are compulsory for all Engineering students.

Overview of Course Structure for the Foundation Year

100 Level Harmattan Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
CHM101	General Chemistry I		3	1	0	4
GNS101	Communication in English		2	0	0	2
GNS103	History and Philosophy of Science		2	0	0	2
GNS105	Modern Agriculture and Rural Development		2	1	0	2
MAT101	Elementary Mathematics I		2	1	0	4
PHY101	General Physics I		3	1	0	4
PHY151	Experimental Physics I		0	0	3	1
STA101	Elementary Statistics		2	0	0	2
	Total Units					***21***

100 Level Rain Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
CHM102	General Chemistry II		3	1	0	4
CHM104	Experimental Chemistry		0	0	6	2
GNS102	Study Skills & Information Communication Technology (ICT)		2	0	0	2
GNS104	Philosophy and Logical Thinking		2	1	0	2
MAT102	Elementary Mathematics II		2	1	0	4
MAT104	Applied Mathematics		2	1	0	3
PHY102	General Physics II		3	1	0	4
PHY152	Experimental Physics II		0	0	3	1
	Total Units					***22***

Olusegun Obasanjo Engineering Workshop

ACADEMIC PROGRAMMES

OFFERED IN THE FACULTY

AGRICULTURAL ENGINEERING PROGRAMME

The programme is one of the two programmes in the Department of Agricultural and Mechanical Engineering and one of the present two (2) Departments under the Faculty of Engineering in the College of Engineering and Environmental Studies of Olabisi Onabanjo University, Ibogun Campus.

The curriculum of the Agricultural Engineering programme is designed to provide students the opportunity to prepare for specialized professional career. This curriculum leads to the honours degree of Bachelor of Science in Agricultural Engineering, normally, at the end of five years. The programme also provides solid academic background, upon which more advanced degrees could be built, if so desired. This programme (Agricultural Engineering) places much emphasis on the necessary balance in Classroom-Laboratory-Industrial training of engineers.

This programme under the Department of Agricultural and Mechanical Engineering is blessed with seasoned academics, who have excelled in their globally relevant areas of specialization. Larger percentages of the academic and Technical staff had already made their marks in various industrial capacities and are duly registered professionally with learned bodies like the Nigerian Institution of Agricultural Engineers (NIAE), Nigerian Society of Engineers (NSE) and Council for the Regulation of Engineering in Nigeria (COREN).

The Agricultural Engineering programme has a standard Tractor shed and equipment workshop (for farm power and Machinery) at the main campus in Ago-Iwoye, (effort is being made to bring them down to the Ibogun Campus). Plans for the following standard Laboratories is in the offing. These include: Soil and Water Conservation Engineering, Post harvest, Farm structures and, Farm electrification, Farm power and Machinery. Plans are underway to commence the Post-Graduate Diploma (PGD) programme in Agricultural Engineering to assist in manpower development of industries in the immediate environment

PHILOSOPHY AND OBJECTIVES

AGRICULTURAL Engineering is one of the basic disciplines of the engineering profession, which concerns itself with the design, construction and use of a variety of equipment ranging from manufacturing and power generating equipment to consumer goods It involves designing agricultural machines that are used for the production, harvesting, storage of farm crops, rearing and care of farm animals, irrigation, soil and water engineering.

Training of graduates in Agricultural Engineering at the Olabisi Onabanjo University will specifically take account of the following:

(i) Provision of broad based academic and practical training to achieve mastery in Agricultural Engineering concepts of design, manufacturing, installation, machine operation and service, marketing, consultancy, research and development.

(ii) Equipping the graduates with enough basic principles of maintenance and repair required to cope with the current industrial status of the country, whereby most machine tools and equipment are imported.

(iii) Harnessing of energy resources and conversion into varieties of intended end-use.

(iv) Production of high level man-power capable of working independently through self employment as well generating employment for the unemployed.

(v) Training individual in the standard engineering practices as applicable to the modern techniques; formulating solutions to the various industrial, manufacturing, and service delivery problems prevalent in our society.

Graduation Requirements

(i) All prescribed 100L science courses. Direct entry candidates may however be exempted from some specified courses – (33 units)

(ii) General courses in Faculty of Engineering (FEG courses) – (23 units)

(iii) General courses outside Agricultural Engineering
(MEG courses) – 41 units (EEG courses) – 6 units

(iv) Compulsory Agricultural Engineering courses
200L–(1 credit), 300L–(21 units), 400L–(15 units), 500L–(37 units)

(v) Electives (Departmental Restricted) – (2 units)

(v) Electives (Free/Faculty Restricted) – (3 units)

(vi) University requirement: General studies courses (GNS) – (10 units)

(vii) Industrial Experience (SIWES) – (6 units)

Total units required for graduation (UME) – 198 units

Total units required for graduation (Direct Entry) – 165 units

B. Sc. AGRICULTURAL ENGINEERING PROGRAMME

200 Level Harmattan Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
AEG 201	Introduction to Agricultural Engineering		1	0	0	1
EEG201	Fundamentals of Electrical Engineering I		2	0	0	2

EEG203	Electrical / Electronics Engineering Lab. I		0	0	3	1
FEG201	Engineering Mathematics I	MAT102	2	1	0	3
FEG203	Engineer-in-Society		1	0	0	1
CPE205	Introduction to Computer Programming		1	0	3	2
GNS201	Nigerian Peoples and Culture		0	0	0	0
GNS203	Communication in French		0	0	0	0
GNS205	Entrepreneurial Studies		0	0	0	0
MEG201	Workshop Practice I		1	0	3	2
MEG203	Engineering Thermodynamics I		2	0	0	2
MEG205	Engineering Mechanics I		2	0	0	2
MEG207	Engineering Drawing I		1	0	3	2
MEG209	Materials Science & Engineering		2	0	3	3
MEG213	Fluid Mechanics I		2	0	3	3
	Total Units					***24***

200 Level Rain Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
EEG202	Fundamentals of Elect. Engineering II	EEG201	2	0	0	2
EEG204	Electrical / Electronics Eng. Lab. II	EEG203	0	0	3	1
FEG202	Engineering Mathematics II	FEG201	2	1	0	3
GNS202	Peace Studies and Citizenship Education		2	0	0	2
GNS204	Introduction to Entrepreneurship Skills		2	0	0	2
MEG202	Workshop Practice II	MEG201	1	0	3	2
MEG204	Strength of Materials I		2	0	3	3
MEG206	Engineering Mechanics II	MEG205	2	0	0	2
MEG210	Engineering Thermodynamics II	MEG203	2	0	3	3
MEG214	Engineering Drawing II	MEG207	1	0	3	2
	Total Units					***22***

FEG 290: SWEP (Vacation Period)

300 Level Harmattan Semester

Course Code	Course Title	Pre-Req.	L	T	P	Units
AEG301	Agricultural Processing & Storage I		2	0	3	3
AEG303	Farm Power & Maintenance I		2	0	3	3
AEG305	Basic Soil Mechanics		2	0	3	3
AEG307	Basic Crop and Science		2	0	3	3
FEG301	Engineering Mathematics III	FEG202	2	1	0	3
MEG301	Mechanics of Machines I	MEG206	2	0	0	2
MEG305	Strength of Materials II	MEG204	2	0	0	2
MEG307	Strength of Materials laboratory		0	0	3	1
MEG313	Machine Design I		2	0	3	3
	Total Units					***23***

300 Level Rain Semester

Course Code	Course Title	Pre-Req.	L	T	P	Units
AEG302	Hydrology		2	0	3	3
AEG304	Hydraulics		2	0	3	3
AEG306	Agricultural Land Surveying		2	0	3	3
FEG 302	Engineering Mathematics IV	FEG301	2	1	0	3
MEG308	Fluid Mechanics II	MEG213	2	0	0	2
MEG310	Fluid Mechanics Laboratory		0	0	3	1
MEG312	Workshop Practice III		1	0	3	2
MEG314	Machine Drawing		1	0	3	2
	Total Units					***19***

FEG 390: SWEP (Vacation Period)

400 Level Harmattan Semester

Course Code	Course Title	Pre-Req.	L	T	P	Units
AEG401	Farm Structure & Environment Control		2	0	3	3
AEG403	Environmental Engineering	AEG302	2	0	3	3
AEG407	Engineering Properties of Biomaterials		2	0	3	3
AEG409	Irrigation & Drainage	AEG304	2	1	0	3
AEG411	Farm Power and Maintenance II	AEG303	2	1	0	3
FEG401	Technical Communications		1	0	0	1

FEG403	Introduction to Entrepreneurial Studies		2	0	0	2
FEG405	Research Method	STA101	1	0	0	1
	Total Units					***19***

400 Level Rain Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
FEG490	Student (Supervised) Industrial Work Experienced Scheme (SIWES)	FEG390	0	0	8	6

500 Level Harmattan Semester

Course Code	***Course Title***	***Pre Req.***	***L***	***T***	***P***	***Units***
AEG501	Agricultural Machinery I	AEG411	2	0	3	3
AEG503	Design of Environmental Engineering Systems	AEG403	2	0	0	2
AEG505	Sustainable Land Clearing & Development		2	0	0	2
AEG507	Agricultural Processing & Storage II		1	0	3	2
AEG511	Agricultural Material Handling		2	0	3	3
AEG513	Soil and Water Conservation	AEG409	2	0	3	3
AEG515	Irrigation Engineering	AEG409	2	0	0	2
AGE509	Research Project I		2	0	3	3
FEG501	Engineering Economics		2	0	0	2
	Total Units					***22***

500 Level Rain Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
AEG512	Farm Electrification		2	0	3	3

AEG502	Agricultural Machinery II	AEG411	2	0	3	3
AEG504	Drainage Engineering	AEG409	2	1	0	3
AEG506	Farm Transportation		2	0	0	2
AEG508	Computer Modeling of Agricultural & Environmental Systems		2	0	3	3
AEG510	Research Project II		2	0	3	3
FEG502	Law and Management		2	0	0	2
	DEPARTMENTAL ELECTIVES (3 Units)					
MEG508	Power Plant Generation		2	0	3	3
MEG512	Fluid Power Engineering		2	0	3	3
	FACULTY ELECTIVES (2 Units)					
AEG514	Rural Water Supply and Sanitation		2	0	0	2
AEG516	Operation Management of Farm Power & Machinery Systems		2	0	0	2
AEG518	Solar Energy Applications to Processing & Storage		2	0	0	2
AEG520	Engineering Geology		2	0	0	2
	Total Units					***24***

COURSE CONTENT / OUTLINE

AEG201: INTRODUCTION TO AGRICULTURAL ENGINEERING (1 Unit)

Introduction to various fields of engineering practices with special emphasis on agricultural engineering. Job opportunities in Agricultural Engineering; components of Agricultural Engineering. Roles of Agricultural Engineering in the development of Nigeria. Case studies in Agricultural Engineering.

AEG303: FARM POWER AND MAINTENANCE I (3 Units)

Tractor-implement relationships. Determination of soil forces, forces acting on an implement. Implement attachment: trailed, semi-mounted and mounted implements. Determination of the forces acting on a tractor/implement combination by graphical and numerical analysis. Dynamic behaviour of implements, lateral and in-operation modes. Implement stability and control. Tractor hydraulic systems. Steerability of implement combination.

AEG302: BASIC SOIL MECHANICS (2 Units)

Introduction to soil mechanics, Engineering Classification of soils. Soil strength and stability, soil structure, seepage, capillary and permeability, compaction, consolidation and moisture-density relationship. Shear stress and stress distribution. Laboratory tests on soil.

AEG304: HYDRAULICS (3 Units)

Fundamental principles of Hydraulics: continuity, energy and momentum. Open channel flow: uniform flow, gradually varied flow. Flow resistance: Manning and Chezy equation. Application of the energy, momentum and continuity equations in combination. Specific energy. Flow in Conduit: Classification of laminar and turbulent flows, Losses in inlet, bends, outlets, etc. Application of continuity, energy and momentum to closed conduit flow. Pipe systems: reservoir/pipe combination. Hardy Cross Flow Measurements.

AEG301: AGRICULTURAL PROCESSING & STORAGE (3 Units)

Milling of grain. Theories of communition (size reduction). Influence of crop variable, mill design, separation and cleaning of grain, grain properties aerodynamic drag, friction resilience, electrical properties leading to machine design. Thin layer drying theory. Extension to deep bed drying. Extraction process, protein, sugar, seed oil. Influence of crop properties. Energy and Mass balance as it relates to Agricultural processing.

AEG307: BASIC CROP AND ANIMAL SCIENCE (3 units)

Crop production in Nigeria-Past, Present and Future. Classification of Crops (Botanical, Agronomic, Special purpose, Life Span). Influence of Soil and Climatic Factors on the distribution of crops. Cropping systems. Propagation materials (seeds, cuttings), Seed rate and germination. Production of tuber crops, cereals, vegetables, fibre crops, tree crops and fruits. Pests and Pest Management. Emphasis will be more on crop and pests of interest in the agro climatic zone of south western Nigeria. Brief introduction to the biology of farm animals. Rudiments of tropical animal production with detailed discussion on handling, housing, feeding. Breeding and health management in poultry, swine, cattle, sheep and goats. Slaughter management and meat handling, with a brief overview of the contributions of the animal industry to the Nigerian national economy.

AEG306: AGRICULTURAL LAND SURVEYING (3 Units)

Introduction to branches of surveying. Basic concepts and Instrumentation, measurement of distances and angles, measurement errors, electronics distance measurement. Coordinate system/bearings. Global Position System (GPS). Adjustment of traverse, leveling operations, uses of leveling and plotting of leveling profiles, contouring, plane table surveying, calculation of Areas and volumes-Simpson's rule, Trapezoidal rule. Calculation of areas from bearing.

AEG401: FARM STRUCTURE & ENVIRONMENTAL CONTROL (3 Units)

Functions and Classification of various farm structures and buildings. Materials of construction, farm planning, silos, cribs, and other storage structures, livestock buildings, farm dwellings, workshop, building for crop production and crop processing structures. Environmental and physiological factors. Design of structural members of wood, steel, plain and reinforced concrete, and local materials. Design of farm structures, column, beam, nailed and local bolted connections of timber. Ventilation system for temperature and moisture control.

AEG403: ENVIRONMENTAL ENGINEERING (3 Units)

Basic concept and theory. Design of solid waste collection and disposal systems. Field and laboratory sampling and monitoring of solid wastes. Analysis of Municipal, Industrial and Agricultural wastes. Solid handling and disposal methods. Air Pollution analysis. Interrelationship between the disposal of solid, liquid, and gaseous wastes and the pollution of air, soil, water. Environmental Modeling. Environmental impact assessment. Water quality characteristics and analysis. Water pollution and abatement control.

AEG407: ENGINEERING PROPERTIES OF BIOMATERIALS (3 Units)

An Engineering analysis of the structure, physical attributes, Mechanical and Rheological properties of Biological materials. Consideration for size, shape, volume, surface area and density. Optical properties. Behaviour of granular materials, physical and biochemical factors influencing change in constitution, including changes during post-harvest period. Maturity and quality concepts and techniques for their assessment.

AEG409: IRRIGATION AND DRAINAGE (3 Units)

Water requirements in an irrigation system, Methods of irrigation, Frequency and amount of irrigation. Irrigation water scheduling. Evaluation of irrigation systems and practices. Design of furrow, border, basin, sprinkler and drip irrigation systems. Effect of poor drainage on plants soils. Drainage requirement of crops, surface drainage, sub-surface drainage. Equipment used for drainage systems.Evaluating irrigation systems and practices. Irrigation water scheduling. Seepage from canals and canal living. Salinity and quality or irrigation water. Reclamation of saline and alkali soils. Feasibility studies of an irrigation project. Economic and financial feasibility of a farm irrigated system.

AEG411: FARM POWER AND MAINTENANCE II (3 Units)

A review of tractor development, internal combustion engines, their principles of operation, construction and maintenance. Hydraulic hitch systems, Power transmission and power-take-off. Theory of Chassis mechanics. Tractor design considerations. Performance testing and cost estimation. Design and performance analysis of various farm machinery. Hitching methods. Power requirements for operating farm equipment and machines. Operation and maintenance of various farm machinery. Field evaluation. Criteria for replacement.

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AEG501: AGRICULTURAL MACHINERY I (3 Units)

Short review of the development of mechanization in various branches of agriculture. Principles of construction, design, operation and adjustment of machines and implements for primary and secondary tillage, as well as land leveling and earth moving. Analysis of forces acting on the plough, Selecting of tillage implement suitable for various Nigerian conditions.

AEG503: DESIGN OF ENVIRONMENTAL ENGINEERING SYSTEMS. Prerequisite: AEG403 (3 Units)

Design and theoretical understanding of environmental processes; biological, physical, and chemical processes, and reactor configurations commonly used for water quality control; applications to the design of specific water and wastewater treatment operations; discussion of pollution prevention and green engineering options.

AEG505: SUSTAINABLE LAND CLEARING & DEVELOPMENT (2 Units)

Machines of land clearing: Bulldozer, tree extractors, graders, rollers, planers etc, Disc burners, Rome plough. Development of land for Agricultural Use – Cuts and Fills and Cost analysis of Agricultural Land Development. Visits to Farm sites.

AEG507: AGRICULTURAL PROCESSING & STORAGE II (3 Units)

Methods of Crop Storage, transportation and preservation in tropical and temperate regions, studied with respect to capital outlay, efficiency and effects of climate. Cleaning and sorting, size-reduction mills, drying principles and practice, driers, solar driers, cold storage.

A**EG509: RESEARCH PROJECT I (3 Units)**

Original individual student project related to a prescribed Agricultural and Environmental engineering problem involving literature review, identification, definition and formulation of problem, theoretical investigations, modeling, simulation, analysis and design.

AEG511: AGRICULTURAL MATERIALS HANDLING (3 Units)

Analysis of systems suitable for handling various agricultural projects. Design and construction of handling systems. Design of conveying equipment such as belt conveyors, forklifts, trucks and carts, and consideration of materials of construction.

AEG512: FARM ELECTRIFICATION (3 Units)

Electricity as a power source on the farm for lighting, farm production and processing.Economics of power supply, Farmstead wiring, Electrical requirement of workshops, barns and storage houses. Motor selection for Agricultural.Care and maintenance of electrical farm installation and machines – hatcheries, milking machines, feed mills.

AEG513: SOIL AND WATER CONSERVATION (3 Units)

Soil-water-plant relationship and application in agricultural and forestry Engineering projects. Principles of soil conservation, Soil and Wind erosion principles and various methods of control, flood problems, drainage in urban and rural areas. Water Resources conservation Development. Land classification for soil conservation. Reduction of soil and water loses. Road designs.Alignment and drainage, CBR test, road construction and materials, Soil stabilization. Foundation Design; stability and design of strip and column foundations, local and general shear failures. Bridge design: Design of small span bridges and culverts.

AEG515: IRRIGATION ENGINEERING (2 Units)

The role of Irrigation in world agriculture. Irrigation in Nigeria. Irrigation principles. Land preparation forming for irrigation. Surface, sprinkler and sub-surface irrigation systems. Advanced design of irrigation systems. Dams: hydrologic design of small dams. Pumps: hydraulic characteristics and selection for varying duties. Irrigation scheduling. Salt problems in irrigated agriculture, leaching, and reclamation of saline and alkaline soils.

AEG502: AGRICULTURAL MACHINERY II (3 Units)

Principles of construction, design, operation of machines used in the farm for seeding, planting, fertilizing, weed control, thinning, spraying, dusting, stalk cutting, forage harvesting and harvesting of field crops and fruits. Equipment or machinery used in major farm operations and their applicability to Nigeria.

AEG504: DRAINAGE ENGINEERING (3 Units)

Introduction: Theories for steady and non – steady state flow problems of heavy soils, surface flow, purpose of drainage, causes of drainage problems; effect of poor drainage systems, subsurface drainage, design of drainage systems. Envelope materials and their design.Loads on conduits, drainage pumping. Well drainage, construction and installation of drains, maintenance of drains economic and legal aspects drainage.

AEG506: FARM TRANSPORTATION (3 Units)

Farm roads, farm transportation systems, development and construction of farm transportation equipment. Farm Transportation System–Standards and specifications. Ergonomics.

AEG508: COMPUTER MODELING OF AGRICULTURAL AND ENVIRONMENTAL SYSTEMS (3 Units)

Integration of Engineering and Biological principles with efficient modeling techniques to solve complex problems in Agricultural operations. Topics include mathematical formulation and modeling of Agricultural and Environmental processes: processes and equipment simulation: optimization:

optimization and control using digital computer techniques. Use of 'canied programme'. Development of individual programmes.

Name of Staff	Qualifications	Rank	Status
PROF. J.O. AKINYEMI	B.Sc., M.Sc. PhD, Reg. Engr., MASABE, MNSE	PROF/DEAN	Full-Time

AEG510: RESEARCH PROJECT II

(3 Units)

Second phase of project investigations, involving the fabrication of the design model, debugging, calibration, testing, data collection and analysis, presentation of comprehensive written report of the investigations.

AEG514: RURAL WATER SUPPLY AND SANITATION (2 Units)

Water requirements, water quality standards, water borne deceases, biochemical oxygen demand. Portable water impurities, sources and treatment methods of Water for rural homes, water lifting devices, Transportation and Distribution Systems. Pipe conveyance, treatment and disposal of Sewage from rural homes, septic tanks, digestion ponds.

AGE516: MANAGEMENT OF FARM POWER MACHINERY SYSTEMS (2 units)

Integrated approach to machinery usage and agricultural production sequence. Equipment Selection Scheduling of operation, seasonality factor, machinery management. Machinery ownership and Financing. Gross Margin Analysis. Optimization of machinery-input combinations. Management of Farm enterprise. Case Studies.

AGE518: SOLAR ENERGY APPLICATIONS TO PROCESSING AND STORAGE (2 Units)

Fundamentals of Solar Radiation. Solar heating and Cooling, Heat Transfer. Solar Energy conversion efficiency. Principles of Solar Collectors. Solar heat storage and storage systems for tropical crops.

ACADEMIC STAFF FOR AGRICULTURAL ENGINEERIMG PROGRAMME

PROF. A. Y. SANGODOYIN	B.Sc., M.Sc. PhD	PROF.	Adjunct
PROF. T. M. A. OLAYANJU	B.Sc., M.Sc. PhD	PROF.	Adjunct
DR. T. M. SAMUEL	B.Sc., M.Sc. PhD	SL/HOD	Full-Time
DR. A.F. ADISA	B.Sc., M.Sc. PhD	SL	Full-Time
MR. K. O. ADAMA	B.Sc., M.Sc.	LII	Full-Time
MR. N.S. LAWAL	B.Sc., M.Sc.	LII	Full-Time
MR. A.O. SOSANYA	B.Sc., M.Sc.	LII	Full-Time
MR. B. A. ADETIFA	B.Sc.	G.A	Full-Time

NON-TEACHING STAFF FOR AGRICULTURAL ENGINEERIMG PROGRAMME

Name	Qualifications	Rank	Status
Mr. Akinsoju E.O.	HND Physics with Engineering Production	Principal Technologist	Full-Time
Mr. A.B. Adelase	ND, HND, NAFDAC Certificate of Honour	Technologist II	Full-Time

ADMINISTRATIVE (NON-TEACHING) STAFF FOR AGRICULTURAL ENGINEERIMG PROGRAMME

Name of Staff	Qualifications	Rank	Status
Mr. Judah O.O.	Senior Secretariat Assistant II	Secretariat Studies Stages I, II & III	OOU: Typist, Office Assitant
Mr. O. Shobiye	Clerical Staff HATISS 2	WASC/SSCE	OOU: Filing, Mails Dispatch

COMPUTER ENGINEERING PROGRAMME

The Computer Engineering programme in the Faculty of Engineering, College of Engineering and Environmental Studies (Ibogun Campus) of Olabisi Onabanjo University was formally commissioned in November 2003 by the Ogun State Government. It has the responsibility for the needs, training and services in Computer Engineering and Technology.

The Technological developments have brought about revolution in our society. The revolution has the effect on our thinking and social norms. In recognition of these facts, the position of the Department of Computer Engineering is to offer the very highest quality that can ever be achieved in field of Computer Engineering and Technology.

The curriculum of the programme of Computer Engineering is designed to provide the student the opportunity to prepare him/her for specialized professional career. This curriculum leads to the honours degree of Bachelor of Science normally at the end of five years. The programme also provides solid academic bases upon which to build more advanced degrees if so desired. The department places much emphasis on the project and the industrial trainings for proper exposure.

The programme offered degree in Computer Engineering. The departmental decision extract at various meetings concluded that the degree may later be splited in to two specialize areas namely Computer Hardware Engineering and Computer Software Engineering. The strength of the Computer Engineering Training is in the practical exposure of the students, thus the College provided the following laboratory for the use of the students: **Digital Electronics Laboratory-** equipped with the latest Electronic Digital Devices for better understanding of instrumentation and measurement, **Computer Engineering Laboratory-** equipped with Hardware Devices for Identification and necessary repair that could be done on them, **Mechanical Work Shop-** equipped with the latest Machines for Shop Floor uses, and **Computer Programming Laboratory-** equipped with Computer Systems. They are networked for the use of the student and research purposes.

PHILOSOPHY AND OBJECTIVES

The aim of the Computer Engineering programme is to produce graduates who can fill the role of engineering practitioners in the computer industry within the global market. This requires that such graduates should be:

(a) Well-grounded in the general area of digital electronic engineering
(b) Capable to undertake the design, construction and maintenance of digital computers.
(c) Versatile in computer and system programming techniques.
(d) Able to adopt and adapt exogenous computer technologies for the solution of local problems.

(e) Able to undertake independent or research studies in the field of computer technology and applications.

The curriculum of the department of Computer Engineering is therefore designed to provide the students the opportunity to prepare for specialized professional career. This curriculum leads to the honours degree of Bachelor of Science normally at the end of five years.

Graduation Requirements

(i) All prescribed 100L science courses. Direct entry candidates may however be exempted from some specified courses – (33 units)
(ii) General courses in Faculty of Engineering (FEG courses) – (23 units)
(iii) General courses outside Computer Engineering
(MEG courses) –23 units
(EEG courses) –15 units
(iv) Compulsory Computer Engineering courses
200L–(1 credit), 300L–(26 units), 400L–(12 units), 500L– (27 units)
(v) Electives (Departmental Restricted) – (4 units)
(v) Electives (Free/Faculty Restricted) – (4 units)
(vi) University requirement: General studies courses (GNS) – (10 units)
(vii) Industrial Experience (SIWES) – (6 units)

Total units required for graduation (UME) – 184 units
Total units required for graduation (Direct Entry) – 151 units

200 Level Harmattan Semester Courses

Course Code	*Title*	*Pre Req.*	*L*	*T*	*P*	*Units*
FEG 203	Engineer In Society		1	0	0	1
FEG 201	Engineering Mathematics I	MAT102	2	1	0	3
FEG205	Introduction To Computer Programming		2	0	0	2
MEG 207	Engineering Drawing L		1	0	3	2
EEG 201	Fundamentals Of Elect. Engineering		2	0	0	2
MEG 201	Workshop Practice L		1	0	3	2
MEG 203	Engineering Thermodynamics I		2	0	0	2
MEG 213	Fluid Mechanics		2	1	0	3
MEG 209	Material Science & Engineering		2	0	0	3
MEG 205	Engineering Mechanics I		2	0	0	2
GNS 201	Nigerian Peoples and Culture		0	0	0	0
GNS 202	Communication in French		0	0	0	0
GNS 203	Entrepreneurial Studies		0	0	0	2

EEG 203	Elect. & Elect. Engineering Lab. I		0	0	3	1
	Total Units					***23***

200 Level Rain Semester Courses

Course Code	***Title***	***Pre- Req.***	***L***	***T***	***P***	***Units***
FEG202	Engineering Mathematics II	FEG201	2	1	0	3
EEG202	Fundamentals of Elect. Engineering II	EEG201	2	0	1	2
CPE204	Introduction To Computer Engineering		1		2	1
MEG214	Engineering Drawing II	MEG207	1	0	3	2
MEG202	Workshop Practice II	MEG201	1	0	3	2
MEG204	Strength Of Materials		2	0	3	3
MEG206	Engineering Mechanics II	MEG205	2	0	0	2
GNS201	Peace Studies and Citizenship Education		3	0	3	2
GNS202	Introduction to Entrepreneurship Skills		2	0	0	2
EEG204	Elect. & Elect. Engineering Lab. II	EEG203	0	0	3	1
	Total Units					***20***

FEG 290 STUDENTS WORK EXPERIENCE PROGRAMME (SWEP)

300 Level Harmattan Semester Courses

Course Code	*Course Title*	*Pre Req.*	*L*	*T*	*P*	*Units*
FEG301	Engineering Mathematics III	FEG202	2	1	0	3
CPE313	Computer Programming Principles		2	0	3	3
CPE361	Computer Engineering Laboratories I		0	0	9	3
CPE321	Physical Electronics		2	1	0	3
EEG333	Electromagnetic Field Theory		3	0	0	3
EEG341	Electric Circuit Theory I		2	1	0	3
EEG311	Measurement And Instrumentation		2	0	3	2
	Total Units					***20***

300 Level Rain Semester Courses

Course Code	*Course Title*	*Pre-Req.*	*L*	*T*	*P*	*Units*
CPE 302	Microprocessor, Architecture & Computer Language		2	1	0	3
CPE 304	Analog Computer Basics	EEGE333	2	1	0	3
CPE 306	Digital Devices & Logic Circuits	EEG 333	3	0	0	3
CPE 308	Computer Aided Designs		1	0	3	2
CPE 364	Digital Lab. I		0	0	3	1
CPE 366	Microprocessor Lab. I		0	0	3	1
CPE 368	Simulation Lab. I		0	0	3	1
EEG342	Electric Circuit Theory II	EEG342	2	0	0	2

FEG 302	Engineering Mathematics IV	FEG301	2	1	0	3
	Total Units					***19***

FEG 390 STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME I (SIWES) 2 UNITS

400 Level Harmattan Semester Courses

Course Code	*Course Title*	*Pre-Req.*	*L*	*T*	*P*	*Units*
FEG401	Technical Communications		1	0	0	1
FEG403	Introduction to Entrepreneural Studies		2	0	0	2
FEG405	Research Method	STA101	1	0	0	1
CPE401	Digital Computer Technology		2	1	0	3
CPE407	Assembly Language Programming	CPE302	2	1	0	3
CPE403	Embedded Systems & Interfacing Techniques	CPE302	2	1	0	3
CPE 461	Computer Engineering Lab III		0	0	3	3
EEG431	Communications Principles	EEG342	2	0	0	2
	Total Units					***18***

400 Level Rain Semester Course

Course Code	*Course Title*	*Pre-Req.*	*L*	*T*	*P*	*Units*
FEG490	Student (Supervised) Industrial Work Experienced Scheme (SIWES)	FEG390	0	0	8	6

500 Level Harmattan Semester Courses

Course Code	Course Title	Pre-Req.	L	T	P	Units
CPE501	Introduction to Software Engineering.	CPE313	2	0	0	2
CPE503	Digital Signal Processing	EEG431	2	1	0	3
CPE505	Computer Communication Networks	CPE401	2	0	0	2
CPE507	Real Time Computer System		2	0	0	2
CPE509	Student Project/Seminar in Computer Eng.		2	0	3	3
FEG501	Engineering Economics		2	0	0	2
	DEPARTMENTAL ELECTIVES (2 Units)					
CPE511	Embedded Systems		2	0	0	2
CPE513	Database Systems		2	0	+0	2
CPE515	Mobile Communications		2	0	0	2
	FACULTY ELECTIVES (2 Units)					
AEG511	Agricultural Materials Handling		2	0	0	2
EEG503	Reliability and Maintainability of Systems		2	0	0	2
MEG511	Energy Technology		2	0	0	2
	Total Units					***18***

500 Level Rain Semester Courses

Course Code	Course Title	Pre-Req.	L	T	P	Units
FEG502	Law and Management		2	0	0	2
CPE502	Introduction to Operating Systems		2	0	1	3
CPE504	Design of Digital & VLSI Systems	CPE403	2	1	0	3
CPE506	Artificial Intelligence		2	0	1	2
CPE510	Engineering Project in Computer Engineering		0	0	3	3
	DEPARTMENTAL ELECTIVES (2 Units)					
CPE508	Computer Maintenance & Troubleshoot		2	0	0	2
CPE514	Solid State Electronics		2	0	0	2
CPE512	Distributed Systems & the Internet		2	0	0	2
	FACULTY ELECTIVES (2 Units)					
AEG506	Farm Transportation		2	0	0	2
EEG552	Industrial Electronics and Applications		2	0	0	2
MEG504	Automobile Engineering		2	0	3	3
	Total Units					***18***

COURSE DESCRIPTION

CPE204: INTRODUCTIONS TO COMPUTER ENGINEERING (1 UNIT)
Philosophy of sciences, History of Engineering Technology. Safety in Engineering and introduction to risk analysis. The role of Engineers in nation building. Computer Engineering as a branch of Electronics. Computer Engineering as related to other Engineering Field. Computer Engineering and Computer Science's Similarities and Differences. Who is a Computer Engineer? Various fields of Computer Engineering.

CPE313: COMPUTER PROGRAMMING PRINCIPLES (3 UNITS)
Principle of good programming; structured programming concept; Debugging and testing; string processing internal searching and sorting, Data structure, recursion.

CPE321: PHYSICAL ELECTRONICS (3 UNITS)
Free electron motion in static electric and magnetic fields, electronic structure of matter, conductivity in crystalline solids, theory of energy bands in conductors, insulators and semi conductors; electrons in metals and electron emissions, carriers and transport phenomena in semi-conductors, characteristics of some electron and photo devices, junction diodes, and transistors, FETs, SCR, vacuum tubes, photo resistors, diodes, transistors, photocell and light emitting diodes. Elementary discrete devices fabrication techniques and IC technology.

CPE361: COMPUTER ENGINEERING LABORATORIES I (3 UNITS)
A laboratory work set up to illustrate topics covered in computer programming, Electronics, measurement and instrumentation. Computer Programming Lab. Electronics Lab. Measurement & Instrumentation Lab.

CPE302: MICROPROCESSOR ARCHITECTURE AND ASSEMBLY LANG. (3 UNITS)

Basic architecture of computer systems including fundamental concepts such as register structure, memory organization and management, organization of peripherals, and machine-level operations. These concepts are integrated through the use of assemblers, linkers and loaders. Topics include: instruction sets, symbolic addressing, bus organization, instruction fetch and execution, read/write cycles, interrupt processing, I/O processing, general microprocessor design.

CPE304: INFORMATION TECHNOLOGY IN ENGINEERING (3 UNITS)
Integrators. Differentiators. Logarithmic amplifiers. Comparators. Digital to Analog conversion. Analog to Digital conversion. Generating waveforms. Characteristics of operational amplifiers.

CPE306: DIGITAL DEVICES AND LOGIC CIRCUITS (3 UNITS)
Introduction to analysis and design of digital systems. Boolean algebra and mapping methods. Karuangh and variable entered maps, combinational logic realization with gates, multiplexes, read only memories (ROMS) and programmable logic arrays (PLAS). State machine analysis and design, state diagrams, redundant state sequential counters and mainly synchronous systems, state machine realization with multiplexes, ROMs and PLAS. Asynchronous systems approach to digital systems designs, top – down design, trail and error methods. Codes, number systems and arithmetic operations. Introduction to computer structures, register transfer, hardware programming methods. Von Neumann machines and

memory systems. Standard logic function with MSI circuits, seven segment display drivers, parity generators/checker encoders, adders, etc.

CPE308: COMPUTER AIDED DESIGN & SIMULATIONS (3 UNITS)

Definition of computer simulation, Importance of modeling and simulation, manufacturing system management, Modeling and simulation as complementary tasks, Computer simulation as an interdisciplinary tool, Examples of computer simulation application in electronics and in various fields of science and technology; PSPICE, LabVIEW MATLAB. General concepts of modeling, Continuous and discrete models and simulation, The model: components, descriptive variables and interaction rules, The concept of model state, Descriptive variables: input, state, output, model parameters, state transition and output functions, Experimental frames and simplified models, Model validation, verification and credibility.

CPE362: COMPUTER ENGINEERING LABORATORIES II (3 UNITS)

A laboratory work set up to illustrate topics covered in microprocessor & Assembly language programming, digital devices & logic circuit, simulations and information technology. Digital Electronics I Microprocessor Lab. I & Simulation Lab.

CPE401: DIGITAL COMPUTER TECHNOLOGY (3 UNITS)

Review of elementary digital concepts, switching properties of electronic devices. Switching an wave-shaping circuits. Generation of non-sinusoidal waveforms; a stable, mono stable and bistable multivibrators, co-operator, Schmitt trigger and time base generators using discrete transistor, operational amplifier or other integrated circuits – Time chips and their applications. Analysis and design of logic gates of various families. Diode logic, RTL, TTL, RCL, MOS and MOS of digital integrated circuits. Interfacing between various logic families. Concepts of small, medium, large and very large scale integration and their consequences, some digital building blocks; flip flops, counters, register and decoders. Introduction to D/A and A/D conversion principles.

CPE403: EMBEDDED SYSTEMS & INTERFACING TECHNIQUES (3 UNITS)

Introduction to microprocessor Hardware & Embedded processor technology; General Purpose processor, Single purpose processors, Application Specific Processor. IC Technology; Full Custom/VLSI semi-custom ASIC, PLD. Error detection and correction methods in hardware communication; Parity, Checksum and CRC checks Communications, Parallel Communications, flags, Interrupts and other Devices, Digital-to-Analogue Conversion, Analogue-to-Digital Conversion, Averaging, Digital Signal Processing Techniques, Filtration, Sensors of Physical Parameters.

CPE461: COMPUTER ENGINEERING LABORATORY III (3 UNITS)

A laboratory work set up to illustrate topics covered in Assembly language programming, Communication principles, Microprocessor and Digital Computer Technology.

CPE501: INTRODUCTION TO SOFTWARE ENGINEERING (2 UNITS)

Programming methodologies, basic concepts, principles of software management document and presentation, software life-cycle; software economics.

CPE500: SEMINAR/DESIGN PROJECT IN COMPUTER ENGINEERING (6 UNITS)

The main purpose of SEMINAR is to provide students with an opportunity to exercise their ability to present and to defend their thoughts on professional topics of their own choice. Students will be encouraged to devote some of their discussions to such topics as continuing professional education, professional societies and organization of engineering employment. Students will also be made aware of

the role and responsibilities of Professional Engineers in society with respect to the environment, ethics, equity, public and worker safety and health considerations.

A significant technical design project in Computer Engineering completed under the supervision of a computer engineering staff member. This design experience is based on the knowledge and skills acquired in earlier course work. Projects may originate from faculty members, students, or external sources. They may have a diverse nature and serve diverse needs. Multi-disciplinary projects are encouraged. **Prerequisites:** The student must be registered in the Computer Engineering programme or have permission of the Department

CPE505: COMPUTER COMMUNICATION NETWORKS (3 UNITS)
Introduction to computer Networking, protocols and Architecture, Transmission Media; transmission medium, characteristic and quality of data transmission, design of data transmission system. guided transmission media wireless transmission. Data Link Control; flow control, Error detection, error Control, frame synchronization, Addressing, Control and data, link Management. Data Transmission; concept and Terminology, Analog and digital data transmission, transmission impairment. Data Communication Interface; Asynchronous and Synchronous transmission interfacing. Data encoding; Digital Data, Digital Signals, digital data analog signals, analog data, digital signals, Analog data, analog signals, spread spectrum.

CPE507: REAL TIME COMPUTER SYSTEMS (2 UNITS)
Techniques that can be used to guarantee the completion of a computation ahead of its deadline. Scheduling techniques for periodic and non-periodic tasks. Organization and functionality of real time kernels. A Project Laboratory is integral to the course. Students must complete a sequence of two projects that involve substantial real time software design and implementation. Students work in teams. Progress is determined through a preliminary design review, presentation

CPE509: DESIGN OF DIGITAL AND VLSI SYSTEMS (2 UNITS)
Advanced combinational and sequential logic design. Optimization of finite state machines; timing methodologies and synchronization issues. Hardware description languages (HDL): structural and behavioral descriptions, simulation and test benches, coding styles, design with HDL and FPGA implementation. Design for test: testing concepts, scan-based design and built-in self-test (BIST). Design for high speed: timing analysis, pipelining and retiming. Design for low power: sources of power dissipation, design transformations.

CPE513: DATABASE SYSTEMS (2 UNITS)
An introduction to the use and operating principles of database management systems. Topics to be covered include: data entities and relationships; data modeling using Entity-Relation Diagrams: hierarchical, network and relational models of databases; query languages; physical representation of data in secondary storage; relational algebra and calculus as applied to the design of databases; security and integrity in the context of concurrent use; and basic ethical issues associated with database design and use.

CPE511: MOBILE COMMUNICATIONS (2 UNITS)
Fading and shadowing, noise and interference effects; source coding, modulation, error control coding, spread spectrum and multiplexing techniques for mobile communications; capacity estimation and comparative (FDMA/TDMA/CDMA) analysis of PCN and Cellular Systems; capacity estimation for wireless PABX and LAN systems.

CPE502: INTRODUCTION TO OPERATING SYSTEMS (3 UNITS)
An introduction to the major concepts of operating systems and study of the interrelationships between the operating system and the architecture of computer systems. Topics discussed include operating system structures, concurrent programming techniques, CPU scheduling, deadlocks, memory management, file systems and protection.

CPE511: EMBEDDED SYSTEMS II (3 UNITS)
Characteristics and design of embedded systems. General purpose Processors; basic architecture data path controller memory operation instruction execution pipelining. programmer's view; instruction set program & data memory space Rehisters I/O Interrupts operating systems microcontrollers. Standard Single-purpose Processors. Timers, counters & Watchdog timers UART, PWM, LCD controller Keypad Controllers Stepper Motor controller Analog-digital converters real-time clock. Custom single-purpose processors; combinational logic design sequential logic designs. Memories; memory hierarchy & Cache. Interfacing; timing diagrams, hardware protocol basics interfacing with a general purpose processor I/O addressing interrupts Direct Memory access. Arbitration, priority arbiter, daisy-chain arbitration Network-oriented arbitration methods, multi-level bus architecture. Computation models; sequential program model, state machine model finite-state machines, FSMD describing a system as a state machine. Formal models and specification languages for capturing system behaviour. Techniques for specification, exploration and refinement. System partitioning and hardware/software co-design. Tools for validation, verification, and simulation. Quality and performance metrics.

CPE506: ARTIFICIAL INTELLIGENCE (2 UNITS)
Philosophy of artificial intelligence. AI programs and languages, representations and descriptions, exploiting constraints. Rule-based and heuristic systems. Applications to engineering.

CPE508: COMPUTER MAINTENANCE AND TROUBLESHOOT (2 UNITS)
Introduction to reliability. Elementary reliability theory. Application to power systems and electronic components. Test characteristics of computer components-types of faults. Designing for higher reliability. Packaging mounting, ventilation. Protection from humidity, dust.

CPE510: SOLID STATE ELECTRONICS (2 UNITS)
Physics and property of semi-conductor including high field effects, carrier injection and semi-conductor surface phenomena, devices technology, bulk and expitaxial material growth and impurity control. Metal-semi-conductor interface properties, stability and methods of characterization controlled and Pre-requisite

CPE512: DISTRIBUTED SYSTEMS AND THE INTERNET (2 UNITS)
Basic concepts of distributed systems. Network architecture and internet routing. Message passing layers and remote procedure calls. Process migration. Distributed file systems and cache coherence. Server design for reliability, availability, and scalability. Internet security and electronic commerce.

ACADEMIC STAFF

Name of Staff	Qualifications	Rank	Status
Prof. Odunaike	BSc. MSc, Ph.D	Professor	Full time

E			
Dr. Laoye J.A.	B.Eng, M.Eng. Ph.D, MNSE, R.Engr (COREN)	Reader	Full time
Dr. Shodiya A.S.	BSc. MSc, Ph.D	Senior Lecturer	Adjunct
Dr. A.D. Agunbiade	BSc. MSc, Ph.D	Senior Lecturer	Adjunct
Dr. M.A. Usman	BSc. MSc, Ph.D	Senior Lecturer	Adjunct
Mr. Olaniyi K.A.	BSc. MSc.	Lecturer I	Full time
Mr.Dipeolu O.	BSc. MSc.	Lecturer II	Full time
Engr.Jagun Z.O.O.	B.Eng. MSc. MNSE, R. Engr. (COREN)	Lecturer II	Full time
Miss. Sanusi O.I	BSc. MSc.	Lecturer II	Full time

TECHNICAL STAFF

Name of Staff	Qualifications	Rank	Status
Mr.S.O. Ezekiel	HND, PGD, B.SC, M.SC (in view)	Technologist I	Full time
Mr. Ogunkeye O.O.	HND, PGD, B.SC, M.SC (in view)	Technologist I	Full time
Mr. Ojo Suara	HND, B.SC	Technologist I	Full time
Mr.O.K.Odukoya	NTC,	Technician I	Full time
Mr. Adekoya G.O.	Diploma in Computer Engineering	Technician I	Full time

ADMINISTRATIVE STAFF

Name of Staff	Qualifications	Rank	Status
Mrs. Oladapo	B.Ed, Cert. Secretarial Studies	Departmental Secretary	Full time
Mr. Sobiye O.O.	SSCE	Clerical Officer II	Full time
Mr. Idah Matthew. O	SSCE	Assistance Clerical Officer	Full time

ELECTRICAL & ELECTRONICS ENGINEERING PROGRAMME

The Electrical and Electronic Engineering programme in the Faculty of Engineering, College of Engineering and Environmental Studies (Ibogun Campus) of Olabisi Onabanjo University was formally commissioned in November 2003 by the Ogun State Government.

PHILOSOPHY AND OBJECTIVES

The main philosophy behind the setting up of Electrical and Electronic Engineering programme is to train students and produce graduates with high academic standards as well as with adequate practical background in Electrical and Electronic Engineering.

Students are exposed to both basic and applied courses as well as laboratories and industrial training to enable them satisfy the manpower needs of the public and industrial sectors of the Nigeria economy.

Graduates are expected to be able to design, supervise engineering projects, construct, and develop a new product. They will also be expected to maintain Engineering units. The programme is organized such that two years of basic training in Electrical/Electronic Engineering is followed by more detailed professional training in the field of Electrical and Electronic Engineering lasting for two years, 11 months of practical training and in the final year.

Specializations and options are provided in the following areas:

(i) Communications / Electronic Engineering

(ii) Electrical Power and Machines

Also at the final year, students are assigned projects in any of the option and specializations stated above with a view to solving practical problems of national and of local interest.

Apart from planned industrial visits during the programme, Students are expected to undergo a minimum duration of 40 weeks industrial training (one semester and 2 long vacations)

Graduation Requirements

In order to be eligible for the degree of B.Sc (Electrical and Electronics Engineering)
A candidate must satisfactory complete a minimum load of 190 units

(i) All prescribed 100L science courses. Direct entry candidates may however be exempted from some specified courses – (33 units)

(ii) General courses in Faculty of Engineering (FEG courses) – (23 units)

(iii) General courses outside Electrical/Electronics Engineering
(MEG courses) –24 units (CPE courses) –13 units

(iv) Compulsory Electrical/Electronics Engineering courses
200L–(6 units), 300L–(31 units), 400L–(15 units), 500L–(12 units)

(v) Electives (Departmental Restricted)
Communication / Electronics Option – (16 units)
Electrical Power & Machine Option – (16 units)

(v) Electives (Free/Faculty Restricted) – (0 Unit)

(vi) University requirement: General studies courses (GNS) – (10 units)

(vii) Industrial Experience (SIWES) – (6 units)

Total units required for graduation (UME) – 189 units

Total units required for graduation (Direct Entry) – 156 units

B. SC. ELECTRICAL & ELECTRONICS ENGINEERING PROGRAMME

Overview of Course Structure

200 Level Harmattan Semester Courses

Course Code	*Course Title*	*Pre Req.*	*L*	*T*	*P*	*Units*
FEG 203	Engineer In Society		1	0	0	1
FEG 201	Engineering Mathematics I	MAT102	2	1	0	3
FEG205	Introduction To Computer Programming		2	0	0	2
MEG 207	Engineering Drawing L		1	0	3	2
EEG 201	Fundamentals Of Elect. Engineering		2	0	0	2
MEG 201	Workshop Practice L		1	0	3	2
MEG 203	Engineering Thermodynamics I		2	0	0	2
MEG 213	Fluid Mechanics		2	1	0	3
MEG 209	Material Science & Engineering		2	0	0	3
MEG 205	Engineering Mechanics I		2	0	0	2
GNS 201	Nigerian Peoples and Culture		0	0	0	0
GNS 202	Communication in French		0	0	0	0
GNS 203	Entrepreneurial Studies		0	0	0	2
EEG 203	Elect. & Elect. Engineering Lab. I		0	0	3	1

	Total Units					***23***

200 Level Rain Semester Courses

Course Code	***Course Title***	***Pre- Req.***	***L***	***T***	***P***	***Units***
FEG202	Engineering Mathematics II	FEG201	2	1	0	3
EEG202	Fundamentals of Elect. Engineering II	EEG201	2	0	1	2
CPE204	Introduction To Computer Engineering		1		2	1
MEG214	Engineering Drawing II	MEG207	1	0	3	2
MEG202	Workshop Practice II	MEG201	1	0	3	2
MEG204	Strength Of Materials		2	0	3	3
MEG206	Engineering Mechanics II	MEG205	2	0	0	2
GNS201	Peace Studies and Citizenship Education		3	0	3	2
GNS202	Introduction to Entrepreneurship Skills		2	0	0	2
EEG204	Elect. & Elect. Engineering Lab. II	EEG203	0	0	3	1
	Total Units					***20***

FEG 290 STUDENTS WORK EXPERIENCE PROGRAMME (SWEP)

300 Level Harmattan Semester Courses

Course Code	***Course Title***	***Pre.Req***	***L***	***T***	***P***	***Units***
FEG301	Engineering Math's III	FEG202	2	1	0	3
EEG311	Measurement and instrumentation		2	0	0	3

EEG321	Electronic Engineering I	2	0	0	2
EEG331	Electromagnetic Field Theory	2	1	0	3
EEG341	Electric Circuit Theory I	2	1	0	3
EEG351	Electromechanical Devices and Machine I	2	0	0	3
EEG361	Electrical / Electronic Lab III	0	0	9	3
CPE313	Computer programming Language I	1	0	3	2
	Total Units				***22***

300 Level Rain Semester Courses

Course Code	***Course Title***	***Pre.Req***	***L***	***T***	***P***	***Units***
FEG 302	Engineering Math's IV		2	1	0	3
EEG 322	Electronic Engineering II		2	1	0	3
EEG 332	Electromagnetic Wave Theory II		2	1	0	3
EEG 342	Electric Circuit Theory II		2	1	0	3
EEG 352	Electromechanical Devices and Machine II		2	0	0	2
EEG 362	Electrical / Electronic Lab IV		0	0	9	3
CPE 302	Microprocessor Fundamental & Application		2	0	0	2
CPE 308	Computer Aided Design &		2	0	1	3

	Simulation	
	Total Units	***22***

FEG 390 STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME I (SIWES) **2** UNITS

400 Level Harmattan Semester Courses

Course Code	***Course Title***	***Pre.Req***	***L***	***T***	***P***	***Units***
FEG 401	Technical communication		1	0	0	1
FEG 403	Introduction to Entrepreneurship		1	0	0	1
FEG 405	Research Method		1	0	0	1
EEG 411	Control Theory I		2	1	0	3
EEG 431	Communication Principles		2	1	0	3
EEG 441	Electric Power Principles		2	1	0	3
EEG 462	Electrical / Electronic Lab V		0	0	9	3
CPE 401	Digital Computer Technology		2	1	3	3
EEG 451	Computer Graphics					3
	Total Units					***21***

400 Level Rain Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
FEG490	Student (Supervised) Industrial Work Experienced Scheme (SIWES)	FEG390	0	0	8	6

500 Level Harmattan Semester - Compulsry Courses

Course Code	*Course Title*	*Pre. Req*	*L*	*T*	*P*	*Units*
EEG501	Electrical Services Design		2	0	0	2
EEG503	Reliability & Maintainability of systems		2	0	0	2
EEG505	Student Project / Seminar		0	0	9	3
FEG501	Engineering Economic		2	0	0	2
CPE501	Intr. To Software Engineering		2	0	0	2
	Total Units					***11***

500 Level Harmattan Semester – Communication / Electronics Option

Course Code	*Course Title*	*Pre. Req*	*L*	*T*	*P*	*Units*
EEG543	Telecommunication Engineering		2	1	0	2
EEG545	Communication System		2	1	0	3
EEG547	Broadcasting		2	1	0	3
	Total Units					***8***

500 Level Harmattan Semester - Electrical Power And Machine Option

Course Code	*Course Title*	*Pre. Req*	*L*	*T*	*P*	*Units*
EEG555	Energy Conversion and Storage		2	0	-	2
EEG545	Communication System		2	1	0	3
EEG523	Power System Engineering I		2	1	0	3

	Total Units	***8***

500 Level Rain Semester - Compulsry Courses

Course Code	*Course Title*	*Pre. Req*	*L*	*T*	*P*	*Units*
FEG502	Engineering Law and Management		2	0	0	2
CPE518	Computer Aided Design		2	0	0	2
EEG552	Industrial Electronics & Application		2	0	0	2
EEG506	Student Project		0	0	9	3
	Total Units					***9***

500 Level Second Semester - Communication / Electronics Option

Course Code	*Course Title*	*Pre. Req*	*L*	*T*	*P*	*Units*
EEG532	Digital Signal Processing		3	0	0	2
EEG544	Computer System Networking		2	0	0	2
EEG508	Control Theory II		3	0	0	3
	Total Units					***8***

500 Level Rain Semester - Electrical Power And Machine Option

Course Code	*Course Title*	*Pre. Req*	*L*	*T*	*P*	*Units*
EEG552	Power System Engineering II		2	1	0	3
EEG544	Computer System Networking		2	1	0	2
EEG510	Control Theory II		3	0	0	3
	Total Units					***8***

COURSE DESCRIPTIONS

EEG 201: FUNDAMENTAL OF ELECTRICAL ENGINEERING I (3 Units)
Pre-requisite: PHY 102.
Definitions and Circuit parameters: basic units , charge potential difference, power, Energy, Resistor, Inductor, Capacitor, Resistance, Inductance, Capacitance. Fundamental theory of electric circuit. Circuit elements. Network theorems: Ohm's law, Kirchoff's current and Voltage Laws, Nodal and Loop analysis, source Transformations, Super position, Thevenin's Theorem, Norton's equivalent Circuit, maximum power Transfer. Steady state response of circuit elements and network. Complex impedance and admittance. AC circuits impedance, admittance, susceptance phasor diagrams. Introduction to electronics, vacuum diode, triode and pentode, small signal equivalent circuits. Elementary discussion of semiconductors P.N junction diode and transistors.

EEG 203: ELECTRICAL LABORATRY I (1 Unit)
Components identification, Circuit layout, uses of electrical tools-multimeter both analog and digital. Experimental work on topics covered in fundamental of Electrical engineering and design and construction of various dc power supplies.

EEG 202: FUNDAMENTAL OF ELECTRICAL ENGINEERING II (3 Units)
Periodic wave forma and their average and effective values. Power Factor Corrections: Characteristics and use of non-linear elements in simple circuits. Magnetic circuits, single phase alternating current circuits. Series and parallel resonance. Power factor correction, magnetic circuits, mutual inductance, Introduction to Electrical machines and polyphase systems; DC generators and motors. Electrical and Electronic power measuring instruments and equipment, A.C. and D.C. bridges. Basic control system, Open/closed loop system, communication fundamental and Introduction to basic communication equipment (T.V. Radio, Telephone).

EEG 204: ELECTRICAL LABORATORY II (3 Units)
Electrical Installation drawing; Experimental work on Fundamental Electrical Engineering. Design and construction of simple circuit

EEG 290: STUDENTS WORK EXPERIENCE PROGRAMME (4 Units)
A practical work programme undertaken during the long vacation arranged within the campus and its immediate environment to enable the students gain some basic skills in the profession of engineering in general and electrical engineering in particular.

EEG 311: MEASUREMENT AND INSTRUMENTATION (3 Units)
Pre-requisite: EEE 202.
Measurement techniques, types of errors; system of units of measurement and conversion. General Instrumentation. Basic meter in DC measurement. Basic meter in AC measurement, rectifier voltmeter, electro-dynamometer and wattmeter, instrument transformers, DC and AC bridge and their applications, general form of AC bridge universal impedance bridge; Electronic instruments for the measurement of voltage, current, resistance and other circuit parameters; electronic voltmeters, AC voltmeters using rectifiers, electronic multimeter, digital voltmeters, oscilloscope; vertical deflection system horizontal deflection system probes, sampling CRO. Instruments for generating and analyzing waveforms, square-wave and pulse generators, signal counters and their applications: time base circuitry; data acquisition system; tape reorders D/A and A/D conversions, sample and hold circuits.

EEG 321: ELECTRONICS ENGINEERING I (3 Units)

Pre-requisite: EEE 201.
Free electron motion in static electric and magnetic fields, electronic structure of matter, conductivity in crystalline solids, theory of energy bands in conductors, insulators and semi conductors; electrons in metals and electron emissions, carriers and transport phenomena in semi-conductors, characteristics of some electron and photo devices, junction diodes, and transistors, FETs, SCR, vacuum tubes, photo resistors, diodes, transistors, photocell and light emitting diodes. Elementary discrete devices fabrication techniques and IC technology. Single stage transistor amplifiers. circuits, analysis and design of multistage amplifier

EEG 322: ELECTRONIC ENGINEERING (3 Units)

Review of elementary digital concepts, switching properties of electronic devices. Switching and wave shaping circuits. Generation of non-sinusoidal waveforms; astable, monostable and bistable multi-vibrators, co-operator,, Schmitt trigger and time base generators using discrete transistor, operational amplifier or other integrated circuits. Time chips and their applications. Analysis and design of logic gates of various families. Diode logic, RTL, TTL, RCL, MOS and CMOS of digital integrated circuits. Interfacing between various logic families. Concepts of small, medium, large and very large scale integration and their consequences. Some digital building blocks; flip flops, counters, register and decoders. Introduction to D/A and A/D conversion principles. Attenuation other communication circuits.

EEG 324: DIGITAL DEVICES AND LOGIC CIRCUITS (2 Units)
Pre-requisite: EEG 322
Introduction to analysis and design of digital systems. Boolean algebra and mapping methods. Karuangh and variable entered maps, combinational logic realization with gates. Review of basic ICs. Multiplexes, read only memories (ROMS) and programmable logic arrays (PLAS). State machine analysis and design, sate diagrams, redundant state sequential counters and mainly synchronous systems, state machine realization with multiplexes, ROMs and PLAS. Asynchronous systems approach to digital systems designs, top – down design, trail and error methods. Codes, number systems and arithmetic operations. Introduction to computer structures, register transfer, hardware programming methods. Von Neumann machines and memory systems. Standard logic function with MSI circuits, seven segment display drivers, parity generators/checker encoders, adders, etc.

EEG 331: ELECTROMAGNETIC FIELD THEORY (3 Units)
Prerequisite: EEG 202
Review of electromagnetic laws in integral form. Gauss' Law, Ampere's and Faraday's Laws: electrostatic fields due to distribution of charges, magnetic fields in an around current carrying conductors. Time varying magnetic and electric fields: conduction and displacement current, .Laplace, poison equation, dipole boundary conditions, Uniqueness theorem, image method. Magneto-static, magnetic induction, flux field strength vector potential.

EEG 332: ELECTROMAGNETIC WAVE THEORY II (3 Units)
Pre–requisite EEG 331.
Maxwell's equation (in rectangular coordinates and vector – calculus notation); derivation of Maxwell's equation; electromagnetic potential and waves; pointing vector, Boundary conditions; wave propagation in good conductors, skin effect, plane waves in unbounded dielectric media, fundamentals of transmission lines, wave guides and antennae. Applications of wave theory in communication, Transfer functions, propagation of electromagnetic wave in free space.

EEG 341: ELECTRIC CIRCUIT THEORY I (3 Units)
Prerequisite: EEG 202
Networks; Node and loop analysis. Non- linear circuit analysis. Two port networks, and Ladder networks. Filters; designs and operation, Low, high, band pass filters, Butter-worth, Chebychev filters; passive and active, network synthesis and analysis. Frequency response of networks; poles and Zeros, Bode plots and Locus concept. Periodic non- sinusoidal currents and linear circuits.

EEG 342: ELECTRIC CIRCUIT THEORY II (3 Units)
Pre – requisite EEG 341.
Fourier and Laplace transforms, application of Laplace transformation to transient analysis of RC circuits, transformation concepts, Reliability of transfer functions, some properties of three – phase systems: balanced delta and wye connected loads. Delta – wye transformation. Balanced delta and wye connected. Network functions, node and loop. Foster and Cauer's methods of synthesis.

EEG 351: ELECTROMECHANICAL DEVICES & MACHINES I (3 Units)
Review of principles of electromechanical energy conversion, general rotating machines. Design construction and characteristics of DC machines. Performance and speed control of shunt and series motors. Transformers, equivalent circuits, design construction, characteristics. Open / short circuit and polarity tests, Regulation. Auto, three-phase transformers, connections and parallel operation.

EEG 352: ELECTROMECHANICAL DEVICECS AND MACHINE II
(3 Units)
Prerequisite: EEG 351.
Synchronous machines, rotation magnetic fields, emf equations, 3-phase alternator, steady-state performance, Mathematical representation of salient and non-salient synchronous machine characteristics. Synchronizing torque, infinite bus and parallel operation. Synchronous motor, construction, characteristic, circuit diagram of induction motors. Torque/sip relation, speed control. Induction generators, single-phase induction motor, universal motor, reluctance motors, applications. Protection of machines.

EEG361: ELECTRICAL/ELECTRONIC LABORATORY I (3 Units)
A laboratory work involving soldering technique, measuring instruments, application of basic wiring and connection of simple circuits. Transformer testing; Laboratory work on electric circuit theory and dc machines.

EEG362: ELECTRICAL/ELECTRONIC LABORATORY II (3 Units)
Laboratory works involving connections of/and winding of Transformers and protective devices. Confirmation of semi-conductors: Op Amp, Timing circuits etc. Experiments to cover topics in Circuit Theory, Electronic Engineering and ac machines.

EEG390: STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME I
(4 Units)
A more advanced programme similar to EEG 290, students are attached to appropriate electrical engineering facilities and industries to further enhance practical approach to engineering through on-the job training.

EEG411: CONTROL THEORY I (3 Units)
Pre requisite: EEG 322,342.
Basic concepts and examples of control systems, Feedback concept, advantages, system classification, structures. Control system components – mechanical, electronic, hydraulic, thermal, position control. Feedback time response analysis, concept of stability criteria. Transient analysis of servo- mechanism,

signal regulators compensation techniques. Serial/ parallel feedback controllers. System transfer functions, signal flow graphs, stability, Routh-Hurwitz criteria. Nicholas chart, compensation technique chart, compensation techniques, introduction to non-linear systems.

EEG431: TELECOMMUNICATION PRINCIPLES (3 Units)

Amplitude modulation, double side band, single side-band and vestigial side-band modulation schemes; simple modulators, power and bandwidth performance. Angle modulation; frequency modulation, phase modulation, bandwidth requirements, clippers and d limiters. Amplitude modulated signal reception; discrimination frequency tracking loop, phase locked loop and noise performance commercial radio systems. Transmission media; attenuation in open space, air, cable and fibre channel; construction of cables and fibre, sampling theorem, pulse amplitude modulation, pulse width modulation multiplexing, quantization systems and pulse code modulation, delta-modulation, courses and correction of errors in PCM and DM, idea and matched filters, frequency acquisition, phase referencing and timing line codes, bock encoding and Shannon's theorem.

EEG441: ELECTRIC POWER PRINCIPLES (3 Units)

Pre requisite: EEG 352

Introduction to power systems and sources of electric energy structure of electric power system load characteristics, electric power transmission and distribution, line impedance, representation and per unit systems, relationship between currents and voltages, regulation of voltage, transmitted power and losses, DC transmission construction of overhead lines and underground cables, power system equipment, standard and safety.

EEG451: COMPUTER GRAPHICS (3 Units)

Hardware aspect; plotters microfilm, plotters displays, graphic tablets, light pens graphical input aids Facsimile and its problems. Refresh display, refresh huggers, changing images, light pen interaction. Two and three dimensional transformations, perspective. Clipping algorithms, hidden live removal, Bolden surface removal Warnocks's method, shading, data reduction for graphical input. Introduction to hand writing and character recognition. Curve synthesis and fitting. Contouring. Ring structures versus doubly linked lists. Hierarchical structures; Data structure; organization for interactive graphics.

EEG461: ELECTRICAL/ELECTRONIC LABORATORY III (3 Units)

A laboratory work designed to covered Communication / Electronic Lab, Instrumentation Lab and Power & Machine Lab.

EEG490: STUDENTS INDUSTRIAL WORK EXPERIENCN SCHEME III (6 Units)

A comprehensive internship programme in which students spend a full semester in approved electrical engineering establishments (private and public) and industries. The exposure also provide opportunity for students to sharpen their technical writing skill through field reports, keeping log – books and prepared technical documents under close supervision of professional and lecturers.

EEG501: ELECTRICAL SERVICES DESIGN (2 Units)

Pre-requisite: EEE 451

Lighting installation. Basic power installation. Power supply and distribution systems: regulations. IEE, NEC. Nigerian standards, choice of cables and conductors, wire systems and accessories, outdoor low voltage lines and cables, protection of low voltage installation, design of electrical installation – domestic, industrial and commercial. Earthling and testing of electric installation, illumination, proposals, contract document preparation.

EEG503: RELIABILITY AND MAINTABILITY OF SYSTEMS (3 Units)

Introduction to Reliability. Maintainability and Availability. Elementary reliability theory. Application to power systems and electronic components. Test characteristics of electrical and electronic components. Types of faults. Designing for higher reliability. Packaging mounting, ventilation. Protection from humidity, dust.

EEG510: CONTROL THEORY II (3 Units)
Pre requisite EEG 411.
Review of frequency analysis, Bode diagrams, Nyquist plots, criterion, relative stability, M-and N-circles. Inverse Nyquist plots. Determination of transfer function from asymptotic plot. Nichols Chart. Root locus plots. 3-term (PID) controllers. Series and parallel compensation design. Design using Bode. Nichols and Root locus methods. Introduction to non-linear control, common types and effects of nonlinearities. Phase plane and describing function analysis. Closed loop response, limit cycle, and stability.
State space description of linear systems, concepts of controllability and observability.

EEG512: DIGITAL CONTROL (3 Units)
Digital control, advantages, and configuration. Concept of sampling:; Nyquist sampling theorem, aliasing, multiple channel sampling, choice of ADC and DAC. Z-transform: direct, inverse and applications. Zero-Order-Hold. Stability analysis. State variables of dynamic system; formulation of state space differential equation, solution to state equation; transition matrix, eigenvalues, and eigenvectors. Discrete PID algorithm. Introduction to neural network, and Robotics.

EEG 522: SOLID STATE ELETRONICS (3 Units)
Pre–requisite: EEG 421
Physics and property of semi-conductor including high field effects, carrier injection and semi-conductor surface phenomena, devices technology, bulk and expitaxial material growth and impurity control. Metal-semi-conductor interface properties, stability and methods of characterization controlled and Pre-requisite

EEG523: POWER SYSTEM ENGINEERING I (3 Units)
Representation of power system; equation and analysis, load flow studies. Gauss-sediel and Newton–Ralphson iteration methods. Load forecasting, economic operation of power, voltage and frequency control of power system. Symmetrical components, symmetrical and unsymmetrical faults, stability studies, steady and transient stability. Switch gear and circuit breaker.

EEG524: POWER SYSTEM ENGINEERING II (3 Units)
Pre-requite: EEG523
Power system protection, principles of fault detection, discrimination and clearance. Various types of relays used in power systems. Over- voltage and insulation coordination. Transients, lightning. Switching. Breakdown mechanisms in solids, liquid and gaseous media. High voltage busing; terms in HV technology. Switch gear and circuit breaker.

EEG532: DIGITAL SIGNAL PROCESSING I (3 Units)
Compare digital and analogue signal processing. Discrete time signals and classification. Discrete signals and Z-transform. Digital Fourier Transform and applications. Fast Fourier Transform. Sampling Theorem; Digital transfer function aliasing, one-dimensional recursive and non-recursive filter. Synthesis of low pass filters. Computer techniques in filter synthesis. Digital signal processing and realization of filters in hardware and soft ware. Basic image processing concepts.

EEG537: POWER SYSTEM COMMUNICATION AND CONTROL (3 Units)
Pre-requite:EEG451

Review of transmission line theory. High frequency communication on power lines. Carrier systems and power line carrier applications. Multiplexing. Telementering, signal processing and regulation; and regulating; regulation transformers.

EEG 540: COMPUTER HARDWARE AND SOFTWARE TECHNIQUES (3 Units)
Pre-requite: EEG 421
Micro-processors: over view of available microprocessor and micro-computer systems and compilers; CPU, memory, ALU, control unit,
Computer architecture: Basic I/O interfacing, bus control, Instruction execution and addressing modes, bus organisation and addressing access.
Memory Interfacing: D\A and A\D converters system, hatches, buffers and development tools; simulator, EPROM programming, assemblers and loaders, Microprocessors applications.

EEG 541: ADVANCED ELETRONICS CIRCUIT DESIGN (3 Units)
Pre-requite: EEG 342
Analysis and design of integrated operational amplifiers, and advanced circuits such as wideband amplifiers, instrumentation amplifiers, multipliers circuits, voltage oscillators, and phase locked loops. Design techniques for advanced analogue circuits containing transistors and operational amplifiers.

EEG 543: TELECOMMUNICATION ENGINEERING (3 Units)
Pre requite: EEG431
Antenna: definitions of elementary parameters, introduction to antennas and operative antennae and the related design parameter; introduction to antenna arrays. Cable telegraphy and telephony characteristics cross talk equation, pole lines, aerial and underground cable. Take graph system, codes, radio systems, terminal equipment (teleprinter, relays, switching systems, and repeaters). Telephone receivers, switching (cross-bar, electronic switches), PBX, PABX transmission standard, Telephone network structure. Television, HDTV and satellite communication system. Internet, GSM and GPS.

EEG 544: COMPUTER SYSTEM NETWORKING (3 Units)
Pre-requite: EEG 441
Communication within computer systems, addressing and data bases. CPU memory- I/O device communications. Communication between systems. Host/host versus host/slave relationships, handshaking protocols and synchronization serial versus parallel communications. Hardware elements of network design –terminals, models, multiplexes and concentrators – message and control processors, communication equipment and carriers. Software elements of computer networks; host processors, communication equipment and carriers. Host operating systems, message and packet switching structure of computer networks. Star, Ring and Hierarchical networks. Internet and Decentralized networks.

EEG 545: COMMUNICATION SYSTEMS (3 Units)
Radio wave propagation; propagation in the ionosphere and rarefied media. Principles of scattered propagation; application in general broadcasting. Radar systems nature of radar equations. Composition of radar systems, application of different types of radars. *Microwave frequencies and uses*; microwave transmission in transmission lines and wave guides, microwave circuits, impedance transformation and matching, microwave circuits; passive microwave devices, resonant and filter circuits, active microwave devices; klystron and magnetron tubes and semi-conductor devices for microwave generation.

EEG 547: BROADCASTING (3 Units)
Elements of broadcasting system; studio design and equipment; microphones; sound disc, magnetic tape recording. Radio transmitter power amplifier, transmitter power ratings, beamwidth, co-channel interference and minimum separation. FM system. Broadcasting regulations. Frequency spectrum;

allocation, assignment and licensing. Regulatory bodies. Radio, TV, Cable and Satellite channels. CATV, MATV. MMDS systems. Concept of digital broadcasting. Packet radio network. Antenna design and installation for radio, TV and satellite. Antenna support: mast. Towers High platform altitude and applications. High definition TV, coding.

EEG 551: POWER ELECTRONIC AND DEVICES (3 Units)
Switching characteristics of diodes, transistors, thyristors, etc. Application of thyristors and other SCR devices. Analysis of diode circuit with reactive loads; analysis of circuits using transistor as switches, power control circuits, ac-de converters, characteristics of switching transformer. Power semi-conductor device protection, inverters, dc-dc converters. Examples of power electronic circuits; Solar devices. Concept of flexible ac control system.

EEG 552: INDUSTRIAL ELECTRONICS and APPLICATION (3 Units)
Pre requisite: EEG 421.
Characteristics and industrial applications of thyristors and other SCR devices, Transducers and their applications in sensing light, voltage, pressure, motion, current temperature, etc. Mechanical relays, solid sate relays, solays and stepping motors. Real time control and remote control concepts in instrumentation. Microprocessors and microcomputer based systems. Fire alarms, burglar alarms, telephone, elevator circuit's home and industrial instrumentation.

EEG 553: ELECTRICAL MACHINE DESIGN (3 Units)
Design of transformers, principles of AC and DC machine design.

EEG 555: ENERGY CONVERSION AND STORAGE (3 Units)
Pre-requite: EEG 441
Electromechanical energy conversion, sources of motive power. Waste heat recovery. Solar energy and other sources of renewable energy. Wind, geothermal, pumps energy storage; primary and secondary cells; car and heavy vehicle batteries. Testing, fault diagnosis, repairs. Effect of environmental factors on battery life

EEG 558: ELECTRIC DRIVES AND TRACTION (3 Units)
Historical development of electric drives. Speed- torque characteristics of shunt, series, compound wound DC motor, AC, induction and synchronous motors. Speed control of drive motor Traction and control, Micro-computer control of drive motors.

EEG 505: FINAL YEAR PROJECT I/ SEMINAR (3 Units)
Original and individual student project related to a prescribed Electrical Engineering problem.

EEG 506: FINAL YEAR PROJECT II (3 Units)
Second phase of investigation involving the fabrication of the designed mode, calibration, resting, data collection and analysis and presentation of a written report of the investigations.

ACADEMIC STAFF

Name of Staff	Qualifications	Rank	Status
Prof K. Odunaike	B.Sc, M.Sc, PhD	Professor	Full Time
Dr.M.O Abdul	B.Sc, M.Sc, PhD MNSE, R Engr (COREN).	Senior Lecturer	Full Time
Engr. Olajide M.B.	B.Eng, M.Eng, MNSE, R Engr (COREN)	Lecturer I	Full Time
Dr. S.S. Olokede	B.Sc, M.Sc MNSE, R Engr (COREN)	Lecturer II	Full Time
Engr. Onaifo Frank	B.Sc, M.EngR.Engr (COREN)	Lecturer II	Full Time
MrOjo R.	B.Sc, M.Eng, MNSE,	Lecturer II	Full Time
MrsOlasunkanmi O.G	B.Sc, M.Eng, MNSE	Lecturer II	Full Time
Mrs. Ade-Ikuesan	B.Sc, M.Eng, MNSE	Lecturer II	Full Time
Prof. T.S. Ibiyemi	B.Sc, M.Sc, PhD MNSE, R Engr (COREN	Professor	Adjunct
Dr J.O. Oni	B.Sc, M.Sc, PhD, MNSE, R Engr (COREN).	Reader	Adjunct
Dr. I.O Megbonwon	B.Sc, M.Sc, PhD MNSE, R Engr (COREN).	Senior Lecturer	Adjunct
Dr (Mrs.) Sodipo	B.Sc, M.Sc, PhD	Senior Lecturer	Adjunct
Dr. Ajenikoko	B.Sc., M.Sc., Ph.D., MNSE, R Engr (COREN)	Senior Lecturer	Adjunct

TECHNICAL STAFF

Name of Staff	Qualifications	Rank	Status
Mr.S.O. Ezekiel	HND, PGD, B.SC, M.SC(in view)	Technologist I	Full time
MR Ogunkeye O.O	HND, PGD, B.SC, M.SC(in view)	Technologist I	Full time
MrOjoSuara	HND, B.SC	Technologist I	Full time
Mr.O.K.Odukoya	NTC,	Technician I	Full time
MrAdekoya G.O	DIPLOMA in	Technician I	Full time

	COMPUTER ENGINEERING		

ADMINISTRATIVE STAFF

Name of Staff	Qualifications	Rank	Status
Mrs Oladapo	B.Ed, Cert. Secretarial Studies	Departmental Secretary	Full time
Mr Sobiye O.O	SSCE	Clerical Officer II	Full time
Mr Idah Matthew. O	SSCE	Assistance Clerical Officer	Full time

MECHANICAL ENGINEERING PROGRAMME

The Mechanical Engineering programme is one of the current two (2) programmes at the Department of Agricultural and Mechanical Engineering which took off effectively in the 2003/2004 academic session under the Faculty of Engineering in the College of Engineering and Environmental Studies of Olabisi Onabanjo University, Ibogun Campus.

The curriculum of the Mechanical Engineering programme is designed to provide students the opportunity to prepare for specialized professional career. This curriculum leads to the honours degree of Bachelor of Science in Mechanical Engineering, normally, at the end of five years. The programme also provides solid academic background, upon which more advanced degrees could be built, if so desired. The Mechanical Engineering programme places much emphasis on the necessary balance in Classroom-Laboratory-Industrial training of engineers.

This programme is blessed with seasoned academics, who have excelled in their globally relevant areas of specialization. Larger percentages of the academic and Technical staff had already made their marks in various industrial capacities and are duly registered professionally with learned bodies like the Nigerian Institution of Mechanical Engineers (NIMechE), Nigerian Society of Engineers (NSE) and Council for the Regulation of Engineering in Nigeria (COREN).

The Mechanical Engineering programme owns the imposing Olusegun Obasanjo Engineering Workshop. While additional major and relevant workshop equipment are being awaited, the programme currently has a number of functional metal working tools, metrology equipment, and some metal and wood working machines. Some disused equipment and machines donated to the programme are locally being refurbished with active student participation in the form of SWEP. In no distant time, the awaited ETF funded Workshop equipment is expected to compliment the existing ones. The following laboratories are also progressively being developed and equipped: Thermodynamics / Heat Transfer Laboratory, Fluid Mechanics Laboratory, Machine Design Laboratory, Solid Mechanics Laboratory and Materials Laboratory.

Plans are underway to commence the Post – Graduate Diploma (PGD) programme in Mechanical Engineering to assist in manpower development of the industrial sector in the immediate environment.

PHILOSOPHY AND OBJECTIVES

Mechanical Engineering is one of the basic disciplines of the engineering profession, which concerns itself with the design, construction and use of a variety of equipment ranging from manufacturing and power generating equipment to consumer goods. Training of graduates in Mechanical Engineering at the Olabisi Onabanjo University will specifically take account of the following:

(i) Provision of broad based academic and practical training to achieve mastery in Mechanical Engineering concepts of design, manufacturing, installation, machine operation and service, marketing, consultancy, research and development.

(ii) Equipping the graduates with enough basic principles of maintenance and repair required to cope with the current industrial status of the country, whereby most machine tools and equipment are imported.

(iii) Harnessing of energy resources and conversion into varieties of intended end-use.

(iv) Production of high level man-power capable of working independently through self employment as well generating employment for the unemployed.

(v) Training individuals in the standard engineering practices as applicable to the modern techniques; formulating solutions to the various industrial, manufacturing, and service delivery problems prevalent in our society.

Graduation Requirements

(i) All prescribed 100L science courses. Direct entry candidates may however be exempted from some specified courses – (33 units)

(ii) General courses in Faculty of Engineering (FEG courses) – (23 units)

(iii) General courses outside Mechanical Engineering (EEG courses) –10 units

(iv) Compulsory Mechanical Engineering courses
200L–(27 units), 300L–(30 units), 400L–(18 units), 500L–(26 units)

(v) Electives (Departmental Restricted)
Thermofluid Option – (6 units), Energy Option – (6 units)
Materials Option – (6 units)

(v) Electives (Free/Faculty Restricted) – (4 units)

(vi) University requirement:General studies courses (GNS) – (10 units)

(vii) Industrial Experience (SIWES) – (6 units)

Total units required for graduation (UME) – 193 units

Total units required for graduation (Direct Entry) – 160 units

B.Sc. MECHANICAL ENGINEERING PROGRAMME

200 Level Harmattan Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
EEG201	Fundamentals of Electrical Engineering I		2	0	0	2
EEG203	Electrical/Electronics Engineering Lab. I		0	0	3	1
FEG201	Engineering Mathematics I	MAT102	2	1	0	3
FEG203	Engineer-in-Society		1	0	0	1
CPE205	Introduction to Computer Programming		1	0	3	2
GNS201	Nigerian Peoples and Culture		0	0	0	0
GNS203	Communication in French		0	0	0	0
GNS205	Entrepreneurial Studies		0	0	0	0
MEG201	Workshop Practice I		1	0	3	2
MEG203	Engineering Thermodynamics I		2	0	0	2
MEG205	Engineering Mechanics I		2	0	0	2
MEG207	Engineering Drawing I		1	0	3	2
MEG209	Materials Science & Engineering		2	0	3	3
MEG213	Fluid Mechanics I		2	0	3	3
	Total Units					***23***

200 Level Rain Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
EEG202	Fundamentals of Elect. Engineering II	EEG201	2	0	0	2
EEG204	Electrical/Electronics Eng. Lab. II	EEG203	0	0	3	1
FEG202	Engineering Mathematics II	FEG201	2	1	0	3
GNS202	Peace Studies and Citizenship Education		2	0	0	2
GNS204	Introduction to Entrepreneurship Skills		2	0	0	2
MEG202	Workshop Practice II	MEG201	1	0	3	2
MEG204	Strength of Materials I		2	0	3	3
MEG206	Engineering Mechanics II	MEG205	2	0	0	2
MEG208	Introduction to Mechanical Engineering		1	0	0	1
MEG210	Engineering Thermodynamics II	MEG203	2	0	3	3
MEG214	Engineering Drawing II	MEG207	1	0	3	2
	Total Units					***23***

FEG290: SWEP (Vacation Period)

300 Level HarmattanSemester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
EEG 351	Electromechanical Devices & Machines		2	0	0	2
FEG301	Engineering Mathematics II	FEG202	2	1	0	3
MEG301	Mechanics of Machines I	MEG206	2	0	0	2
MEG303	Manufacturing Technology	MEG202	1	0	3	2
MEG305	Strength of Materials II	MEG204	2	0	0	2
MEG307	Strength of Materials laboratory		0	0	3	1
MEG309	Applied Thermodynamics I	MEG210	2	0	3	3
MEG311	Engineering Metallurgy	MEG209	2	0	0	2
MEG313	Machine Design I		2	0	3	3
	Total Units					***20***

300 Level Rain Semester

Course Code	Course Title	Pre-Req.	L	T	P	Units
EEG352	Electromechanical Devices & Machines II	EEG351	2	0	0	2
FEG 302	Engineering Mathematics IV	FEG301	2	1	0	3
MEG302	Mechanics of Machines II	MEG301	2	0	0	2
MEG304	Mechanical Measurement & Instrumentation		2	0	0	2
MEG306	Computer Aided Design & Manufacturing.		1	0	3	2
MEG308	Fluid Mechanics II	MEG213	2	0	0	2
MEG310	Fluid Mechanics Laboratory		0	0	3	1
MEG312	Workshop Practice III		1	0	3	2
MEG314	Machine Drawing	MEG214	1	0	3	2
MEG316	Mechanical Maintenance & Repair		1	0	3	2
	Total Units					***20***

FEG390: SWEP (Vacation Period)

400 Level Harmattan Semester

Course Code	Course Title	Pre-Req.	L	T	P	Units
FEG 401	Technical Communications		1	0	0	1
FEG 403	Introduction to Entrepreneurial Studies		2	0	0	2

FEG405	Research Method	STA101	1	0	0	1
MEG401	Machine Design II	MEG313	2	0	3	3
MEG403	Vibrations	MEG302	2	0	3	3
MEG405	Applied Fluid Mechanics	MEG308	2	0	0	2
MEG407	Heat and Mass Transfer		2	0	3	3
MEG409	Mechanics of Metal Forming	MEG311	2	1	0	3
MEG411	Refrigeration and Air conditioning		2	0	0	2
MEG413	Automatic Control Systems	MEG304	2	0	0	2
	Total Units					***22***

400 Level Rain Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
FEG490	Student (Supervised) Industrial Work Experienced Scheme (SIWES)	FEG390	0	0	8	6

500 Level Harmattan Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
FEG501	Engineering Economics		2	0	0	2
MEG501	Internal Combustion Engines	MEG309	2	0	3	3
MEG503	Fluid Machinery	MEG405	2	0	3	3
MEG505	Industrial Engineering		2	0	0	2
MEG507	Fundamentals of Tribology		2	0	0	2
MEG509	Assigned Project		2	0	3	3
	DEPARTMENTAL ELECTIVES(3 Units)					
MEG511	Energy Technology		2	1	0	3
MEG513	Refrigeration & Air-conditioning II	MEG411	2	0	3	3

MEG515	Mineral Processing & Extractive Metallurgy		2	0	3	3
	FACULTY ELECTIVES(2 Units)					
AEG 501	Agricultural Machinery I		2	0	0	2
CPE501	Introduction to Software Engineering		2	0	0	2
EEG503	Reliability & Maintenance of Systems		2	0	0	2
	Total Units					***20***

500 Level Rain Semester

Course Code	***Course Title***	***Pre-Req.***	***L***	***T***	***P***	***Units***
FEG502	Law and Management		2	0	0	2
MEG500	Engineering Systems Analysis		2	0	0	2
MEG502	Advanced Heat Transfer		2	0	0	2
MEG504	Automobile Engineering		2	0	3	3
MEG506	Production Engineering		2	0	3	3
MEG510	Assigned Project		2	0	3	3
	DEPARTMENTAL ELECTIVES (3 Units)					
MEG508	Power Plant Generation		2	0	3	3
MEG512	Fluid Power Engineering		2	0	3	3
MEG514	Advanced Strength of materials	MEG305	2	1	0	3
	FACULTY ELECTIVES (2 Units)					
AEG506	Farm Transportation		2	0	0	2
CPE506	Artificial Intelligence		2	0	0	2
EEG544	Computer System Networking		2	0	0	2
	Total Units					***20***

COURSE CONTENT/OUTLINE

MEG201: WORKSHOP PRACTICE 1 (2 Units)
Introduction to workshop practice, types of machine: Lathe, milling machine, shaper, drill, folding machine, shear, press, etc; their uses and tools. Safety in workshop; Organization of the workshop; Introduction to methods and tools for producing thread, holes, slots, tapers, etc. Influence of the shapes and sizes of the tools on the detail of these parts introduction to wood workshop tools properties of wood and their influence on the detailed design of wooden structures and components, e.g. wood fasteners, and preservation measures.

MEG203: ENGINEERING THERMODYNAMICS I (2 Units)
Basic concepts; units in use; open and close system; thermodynamics as the study of inter-relationships between work, heat and the properties of system, thermodynamics properties of a system; pressure, specific volume, temperature, internal energy. The first law of thermodynamics and its corollaries. Flow and non-flow processes, steady state equation and its application.

MEG205: ENGINEERING MECHANICS I (STATICS) (2 Units)
Fundamentals of mechanics; Forces in space, equivalent system, equilibrium of rigid bodies, distributed forces, center of gravity, internal actions, analysis of simple structures and machine parts.

MEG207: ENGINEERING DRAWING I (2 Units)
Engineering drawing as a means of communicating technical details for structures, components, engines etc. Materials and instrument in use for engineering drawing; Different types of lines & their uses; lettering, borderlines, details-box and dimensioning on drawings, paper sizes, drawing layout; First and third angle projections briefly introduced; Construction of points, lines angles, triangles and polygons; Orthographic projections; Conic sections; ellipse, parabola and hyperbola; Loci including involutes, cycloid, epi and hypocycloids etc.

MEG209: MATERIALS SCIENCE & ENGINEERING (3 Units)
Physical properties of materials; wood, cement, plastics, metallic states. Crystals and defects in crystals; Isotropy and anisotropy; Essential and desirable properties of engineering materials; physical, mechanical, thermal, chemical, technological and electrical properties. Common engineering materials for structures, machine parts / equipment, electrical items, instruments, etc. Inherent properties in these and how they may be modified as required. Factors to be taken into account in the selection and choice of engineering materials. Metal Working Principles of Mechanical Testing of materials.

LABORATORY COMPONENT: Experiments on Mechanical Testing of materials.

MEG213: FLUID MECHANICS (3 Units)
Nature and types of fluids. Physical properties of fluids. Fluids static. Stability of submerged and floating bodies. Fluids flow concepts, conservation of mass, momentum energy. Simple application of conservation laws. Flow measurements.
LABORATORY COMPONENT: Experiments on Physical properties of fluids. Fluids statics. Stability of submerged and floating bodies. Fluids flow , conservation of mass, momentum energy. Simple application of conservation laws. Flow measurements.

MEG202: WORKSHOP PRACTICE II (2 Units)
Introduction to automobiles; main components of automobiles. Fundamentals of Engine operation and construction; basic concepts and definitions, engine cycles; principles of operation of valve mechanism, cooling, lubrication, fuel and starting systems, etc. Maintenance and general servicing of automobiles; daily, routine, preventive maintenance, etc. Fault tracing, troubleshooting and remedies for ignition, fuel,

brake systems, etc. Fabrication and machining of components from available drawings. Welding and fabrication; fundamentals of welding, welding processes, welding joint preparation, weld inspection, etc.

MEG204: STRENGTH OF MATERIALS I (3 Units)

Resultants of forces, moments and couples. Equivalent force systems. Hooke's law. Method of superposition. Stresses and deformation resulting from temperature changes. Stresses in thin cylinders and sphere. Stresses on inclined planes. Principal stresses, structural mechanics of statically determinate rigid body systems and plane pin-jointed frames. Bending moment and shear stresses in beams. Simple beams, trusses and columns. Deflection of beams, torsion.

MEG206: ENGINEERING MECHANICS II (DYNAMICS) (2 Units)

Kinematics of a particle, system of particle and rigid bodies. Kinetics of particle, rotating coordinate system, energy and momentum methods. Applications. Lagrange's and Hamilton's equation.

MEG208: INTRODUCTION TO MECHNANICAL ENGINEERING (1 Unit)

Introduction to various fields of engineering practices with special emphasis on mechanical engineering. Job opportunities in mechanical engineering; components of mechanical engineering. Roles of mechanical engineering in the development of Nigeria. Case studies in mechanical engineering.

MEG210: ENGINEERING THERMODYNAMICS II (3 Units)

The second law of thermodynamics and its corollaries. Reversibility and Irreversibility. The Thermodynamic temperature scale. Entropy and its characteristics. Pure substances. State changes in a system consisting a pure fluid substance. Introduction to heat engines and heat pumps. Refrigeration, gas liquefaction, phase equilibria, chemical equilibria for homogenous and heterogeneous systems.

LABORATORY COMPONENT: Experiments on Kinematics of a particle, system of particle and rigid bodies. Kinetics of particle, energy and momentum methods. The second law of thermodynamics and its corollaries.

MEG214: ENGINEERING DRAWING II (2 Units)

Representation of mechanical fastener in drawing; bolts, nut, studs, cap screws, rivets, etc. Internally threaded holes. Sectioning practices; necessity for sectioning, cutting planes and cutting planes lines; full and half sections; hatching; rules relating to sectioning; examples of sectioning in machine drawing. More on orthographic projections for standard machine parts. Isometric projections Points, lines and object in space; true shapes and dimensions. Auxiliary views, elementary intersection curves and development. Assembly drawings Cam profiles Symbols and abbreviations used in mechanical, civil and Electronic/Electrical Engineering.

MEG301: MECHANICS OF MACHINES I (2 Units)

Newton's laws and the fundamentals of rigid dynamics. Displacement, velocity and acceleration of points in simple mechanism in two-dimensional motion. Loci, graphical analysis, instant centres, images. Flexible shaft couplings, virtual work energy and speed fluctuations in machines. Power transmission by clutches and belts. The flywheel and mechanical governors.

MEG303: MANUFACTURING TECHNOLOGY (2 Units)

Sand testing and conditioning; pattern and mould making. Metal nucleation and solidification. Foundry practice, cast testing and analysis fabrication methods, forming from liquid and particle-stress. Introduction to special manufacturing processes. An introduction to the principle of metal removal and the physics of metal cutting. The study of tool geometry requirements of modern processes.

Consideration of machine speeds, feeds, tolerance, and surface finish determinate as related to both manually and numerically controlled machines.

MEG305: STRENGTH OF MATERIALS II (3 Units)

Two dimensional stress and strain analysis. The concept of stress at a point, principal stresses, principal strain; Hooke's law; torsional loading, shear forces, and bending moment; thin and thick walled cylindrical pressure vessels, deflections under flexural loading, statically determinate and indeterminate structures, shear flow, strain energy, failure theories, repeated loading, impact loading.

LABORATORY COMPONENT: Demonstration of Hooke's law Experiment on stresses-strain relationship. Bending stresses in beams. Demonstration of deflection of beams.Mechanical test, impact test, hardness test, fatigue tests, creep and non-destructive tests of engineering materials. Testing of magnetic materials e.g. Transformer cores, testing of insulators, cable and transformer oils.

MEG309: APPLIED THERMODYNAMICS I (3 Units)

Properties of a mixture of ideal gases, properties of a mixtures of an ideal gas and a condensable vapour; psychrometry. Application of first and second laws of thermodynamics to combustion. Analysis of vapour and gas power cycles. General thermodynamics relations. Multi-stage reciprocating compressors, rotary compressors, centrifugal and axial flow, stagnation properties, a simple gas turbine plants, the steam power plants, combustion of fuels; chemistry of common hydrocarbon fuels; combustion with deficiency or excess air, Thermos chemistry; Hess law of heat summation, heat of combustion and reaction, ideal adiabatic flame temperature, reciprocating internal combustion engines.

MEG311: ENGINEERING METALLURGY (2 Units)

Structure of crystalline materials; solidification; mechanical working; liquid and solid solution; concept of phase equilibrium. Micro and macro structure of materials. The modification of properties through changes in micro structure. Materials strengthening mechanism, alloying including high strength and heat resistant alloys; non ferrous metal and their alloys. Tool steels. Metallurgy of casting, brazing, soldering and welding, modern welding techniques and applications; weldability of industrial materials. Non-destructive material testing.

MEG313: MACHINE DESIGN I (3 Units)

Principles of design. Simple stress analysis. Use of threaded and non-threaded fasteners. Shaft design. Design of screws. Flexible mechanical elements (belt and chain drives), Coulpings, clutches and brakes. Mechanical springs. Antifriction bearings, rolling contact bearings. Identification of standard machine components.

MEG316: MECHANICAL MAINTENANCE AND REPAIRS (2 Units)

The need for maintenance and repairs. Types and Procedure for machinery inspection; maintenance tools and equipment; Troubleshooting of equipment. Requirement of operators. Safety by good maintenance. Upgrading aged machinery. Prediction of the rate of wear. Maintenance of plants. Adjustment of belt and chain drives, brake and clutches. Treatment of wornshafts, bearing, etc. Lubrication. Reassembly of machine process, equipment maintenance.

MEG302: MECHANICS OF MACHINES II (2 Units)

Gear tooth geometry, involumetry, typical gearing, cam displacement diagrams layout, equivalent mechanisms. Force analysis, mechanics, fluctuation of kinetic energy and inertial effects. Complete static and dynamic analysis. Balancing of multi-cylinder engines (in-line, vee and radial engines).

MEG304:MECHANICAL MEASUREMENT & INSTRUMENTATION (2 Units)

Measurement principles and basic definitions. Standard Accuracy and error analysis; measurement statistical instrument systems; sensing devices, transmitting devices, typical systems and devices for measuring quantities such as temperature, pressure, flow, size, displacements, velocity, acceleration, force, power, torque, stress and strain. Analog methods of measurements. Data presentation and curve fitting.

MEG306: COMPUTER AIDED DESIGN & MANUFACTURING

(2 Units)

CAD Introduction to computer graphics. Plotting and drawing with computer software. Principles of writing interactive software. The applications of computer graphics in computer-aided design. Computer-aided Design project. CAM Trends in manufacturing technology. Computer-aided manufacturing system. Case in facility planning, group technology and process design. Numerical control introduction to direct and adaptive control, elementary application of computers in material handling and production.

MEG308: FLUID MECHANICS II (3 Units)

Kinematics of fluid motion; streamlines, velocity, acceleration, rotation and circulation. Control volume analysis, continuity, momentum, angular momentum and energy equations. The euler equation, Bernoulli's equation; Lamina incompressible flow between parallel plates, circular tubes and circular annuli; Lamina and turbulent flow in pipes. Pipe network flow measurements; pressure, velocity and flow rates. Potential flow. Aerofoil theory. Boundary layer theory. Navier strokes equation and simple applications. Compressible flows, Isentropic flow, speed of sound, wave phenomenon, flow in nozzle and diffuser, shock wave, Raleigh & fanno line flows.

LABORATORY COMPONENT. Pressure measurements; stability of floating bodies, flow measurements using venturimeter, orifice, weir, rotameter, etc. impact of jet on flat and round surface.

MEG312: WORKSHOP PRACTICE III (2 Units)

Practical operation of machine tools; lathe, milling, shaping, drilling machines. Description of machine tools with reference to the following; fixture, work holding devices or methods, tool or cutter classification used, indexing and thread cutting calculation, etc. Importance of tool grinding and cooling agents to machine tools. Installation, testing and maintenance of machine tools; machine tool alignment, machinery mounts and fixing, foundry and casting techniques; foundry materials and tools, casting methods /techniques.

MEG314: MACHINE DRAWING (2 Units)

Projection of lines; auxiliary views and mixed projections. Preparation of detailed working drawing for production; semi-detail drawings, conventional presentation methods. Assembly drawing of machines, devices and installation layout. Itemization and parts listing. Drawing office practice and reprographics.

MEG401: MACHINE DESIGN II (3 Units)

Design of various joints (riveted, brazed, welded, key, pins, splines). Design and production matching (Limits and fits). Design of gear systems (spur, helical, bevel, worm gear) including strength of cast, forged and welded housing and structures. Joints, fasteners, shaft and bearing mountings. Design project (to be carried out in groups of 3 to 4 students per group).

MEG403: VIBRATION (3 Units)

Free and forced oscillation for lumped mass-spring system with an without damping. Detailed study of one degree of freedom system in Mechanical vibration. Multi-degree of freedom system by receptance, impedance methods. Selected topics including rigid body vibration on elastic coils. Perturbation methods of non-linear vibration problems. Vibration of machinery; free and forced vibration. Natural frequencies, damping and critical speeds; Transverse vibration of beams. Whirling of shafts torsional

vibrations. Introducing-; Transient and harmonic excitation of simple linear systems. Natural frequency and normal modes, orthogonality, generalized coordinates and forces. Lagrange equations. Approximate methods of multi-degree of freedom systems. Vibration of continuous systems. Non-linear system vibration, vibration isolation. Transmission of vibration.

MEG405: APPLIED FLUID MECHANICS (2 Units)

Analysis and design of pipe networks. Survey of hydraulic fluid and their properties seals. Performance characteristics and selection criteria for pumps, compressor, fan, motor, accumulators, valves actuators-Introduced. Typical fluid power circuits (hydraulics, pneumatics) -open center, close centre, meter-in, meter-out. Design of fluid power systems –Loads: Inertia, overrunning, resistive. Selection criteria for fluid power machinery and components, fluidics devices and systems: principles of operation and characteristics, Industrial and machine tools applications of fluid logic circuit.

MEG407: HEAT AND MASS TRANSFER (3 Units)

Modes of heat transfer, general heat conduction equation. Steady state of conduction in one dimension, composite bodies lagging, economics of insulation. Thermal convection, use of dimensional analysis, relative heat transfer, black bodies, grey surfaces. Heat exchanger, extended surfaces engine cooling. Combined modes of heat transfer. Mass transfer between phases, Humidification gases, types of gases, types of dryers and evaporators.

MEG409: MECHANICS OF METAL FORMING (3 Units)

Metal forming, stress-strain curves, yielding, Mohr's circle yield criterion true stress-strain curve; compression tests, torsion tests etc. for yield stress determination. Determination of working loads by consideration of work and stress distribution; by consideration of metal flow. Examination of processes; rolling of flats and strips, extrusion, tube making deep drawing, forging, punching and piercing. Friction and lubrication in metal making. Adhesive in engineering. Aspects of wedding design, weldability of materials weld stresses and distortions, methods of relieving weld stresses.

MEG411: REFRIGERATION & AIR CONDITIONING (2 Units)

Fundamentals of vapour compression refrigeration. Analysis of refrigeration cycles. Heat pumps. Refrigerants and their properties. Absorption refrigeration. Principles of air-conditioning with emphasis on themodynamics processes involving air-water vapour mixture.

MEG413: AUTOMATIC CONTROL SYSTEM (2 Units)

Linear feedback control theory with emphasis on mechanical systems; transient and frequency response, stability, system performance, control modes, compensation methods; analysis of hydraulic, pneumatic inertial components and systems. Transducers; Differential equations of control system.

MEG501: INTERNAL COMBUSTION ENGINES (3 Units)

Review of basic thermodynamics principles. hydrocarbon fuels, structure, properties and test methods. Alternative fuels for internal combustion engines. Combustion: stoichiometry, effects of dissociation, residual fraction, etc. Fuel-air cycle analysis using combustion charts. Piston engine combustion phenomena: pre-ignition, detonation and knock. Exhaust gas emissions; formation, characteristics effects, methods of measurement and reduction. Legal requirements. Fluid mechanics of internal combustion engines, fuel systems, intakes and exhaust systems. Alternative engines: gas turbine, wankle, stirling. electric etc. Turbo charging and turbocharger .Engine noise: sources, characteristics, methods of measurement and reduction. Design of engine components.

MEG503: FLUID MACHINERY (3 Units)

Introduction to Turbo machinery. Characteristic curve for axial-flow and centrifugal pumps, fans flowers, impulse and reaction turbines, fluid couplings, similarity laws. Pelton wheel, reaction turbine, hydraulic

transmission, fluid coupling, torque converter, hydraulic accumulators and application to cranes hydraulic intensifiers.

MEG505: INDUSTRIAL ENGINEERING (2 Units)
Formation and optimization of mathematical models; Techniques of operations research such as mathematical programming, queuing theory, inventory mode replacement techniques applied to production control and inventory control. Transportation and assignment problems; critical path analysis, PERT. Production planning; production control forecasting, work study, work system design. Quality control. Industrial and product safety. Process capability and reliability measurements process and design. Practical problem of data collection and problem formulation.Applied linear programming.

MEG507: FUNDAMENTALS OF TRIBOLOGY (2 Units)
Lubrication mechanics: principles of friction, lubrication and wear. Types and properties of lubricants, materials for tribological applications. Dry and boundary friction, surfaces studies; topography and quality. Hydrodynamic theory applied to tapered wedge and journal bearings, hydrostatic lubrication applied to journal bearings. Air lubrication.

MEG509: ASSIGNED PROJECT (3 Units)
Industrial oriented research project relevant to individual candidate's area of specialization. Independent investigation resulting in project. Credit assigned upon successful production of a project. Open to all final-year students with the approval of the assigned supervisor.

MEG511: ENERGY TECHNOLOGY (3 Units)
Energy and society. Sources of energy. Energy demand, supply and forecasting. Conventional and unconventional (renewable) energy. Energy conversion systems. Direct and indirect solar energy applications. Energy and the environment. Energy conservation.

MEG513: REFRIGERATION AND AIR-CONDITIONING II (3 Units)
Application of thermodynamic theory and design principles to comfort cooling, food refrigeration and cryogenic systems. Refrigeration and air-conditioning equipment design, fault diagnosis, scheduled maintenance.

MEG515: MINERAL PROCESSING AND EXTRACTIVE METALLURGY (3 Units)
Ore preparation, drying, roasting, sintering and heat balance. Floatation solution chemistry and surface chemistry as related to froth and floating. Absorption, interfacial energy, flocculation; depression and floatation kinetics. Hydro and Electro-metallurgy; physical and chemical principles involved in the extraction and refining of metal by hydro and Electro-metallurgical techniques-unit.

MEG500: ENGINEERING SYSTEM ANALYSIS (2 Units)
Introduction to major concepts and techniques of system analysis as approach to engineering problem solving. Calculus of variation, maximum principles, dynamic programming. Optimization and optimum seeking methods. Project analysis of metallurgical processing systems. Methods of estimating process costs and profitability regression analysis and statistical testing. Application to real problems in planning and design of mechanical metallurgical systems.

MEG502: ADVANCED HEAT TRANSFER (2 Units)

Advanced treatment of Heat exchanger, extended surfaces engine cooling. Combined modes of Heat transfer. Mass transfer between phases, Humidification gases, types of gases, types of dryers and evaporators further treated. Turbine theory, Combustion & Fuel Analysis

MEG504: AUTOMOBILE ENGINEERING (3 Units)
Mechanics of vehicles. Vehicle components and design. Traction, engine and transmission data. Fuel system. Clutches, gear-boxes: manual and automatic. Transmission. Suspension systems. Body and chassis.

MEG506: PRODUCTION ENGINEERING (3 Units)
Review of manufacturing technology. Design and production metrology; metrology laboratory setting, metrological experiment techniques, application of metrology, control of metrology labs. Design of manufacturing facilities; production systems; network based management, production organization; inventory models and designs. Production.

MEG508: POWER GENERATION PLANTS (3 Units)
Design, performance, selection of prime movers for small power-generating plants. Diesel and gas turbine plants. Thermal and hydroelectric power stations, their types, mechanical systems and installations, performance, operation, and maintenance. Fundamentals of electrical generators; performance and energy distribution systems

MEG510: ASSIGNED PROJECT Pre-requite: MEG509 (3 Units)
Continuation of the research project relevant to individual candidate's area of specialization. Independent investigation resulting in project. Credit assigned upon successful production of a project. Open to all final-year students with the approval of the assigned supervisor.

MEG512: FLUID POWER ENGINEERING (3 Units)
Properties of hydraulic, pneumatic and fluidic systems and components. Principles of design of pumps, blowers, and turbines. Detailed consideration of cavitations, pumping of liquids and pump selection. Flow and pressure control valves. Hydrostatic and hydrokinetic transmission systems. Principles of sealing Hydraulic machinery and circuits. Introduction to fluidics.

MEG514: ADVANCED STRENGTH OF MATERIALS (3 Units)
Review of concepts in solid mechanics; stress, strain, momentum balance, energy principles, linear and non-linear stress-strain laws. Plane stress and strains in cylinders. Small deflections of plates, classical approximate and strain energy methods. Computer applications, cylindrical shells. Analysis of stress and strain; Torsion theory. Introduction to plasticity, slip line theory and plastic stress-strain laws. Fracture mechanics.

ACADEMIC STAFF IN MECHANICAL ENINEERING PROGRAMME

Name	Qualification	Rank	Status
Prof. E. P. Oaikhiinan	B.Sc.(Staffordshire), M.Sc. (Leeds), Ph.D (Cardiff) , MNSE, MNMS, MICeram, R. Engr. (COREN)	Professor	Full time
Prof. J.O. Akinyemi	B.Sc., M.Sc., PhD, Cert. (Bet-Dagan), MNSE, MASABE, MNIFST, MNIAE, MNSES, MCSAE, R. Engr. (COREN)	Professor	Associate
Dr. O.S. Ismail	B.Sc., M.Sc., Ph.D. MNSE, R. Engr. (COREN)	Senior Lecturer	Full time
Dr. T.M. Samuel	B.Sc., M.Sc., Ph.D. MNSE, MNIAE, AMNIM, MNIFST, R. Engr. (COREN)	Senior Lecturer	Associate
Dr. (Mrs.) S.I. Kuye	B. Sc., M. Sc., Ph.D., R. Engr. (COREN)	Senior Lecturer	Full time
Mr. A. T. Layeni	B.Sc., M.Sc., MASME, R. Engr. (COREN)	Lecturer I	Full time
Mr. O.O. Akinyemi	B.Eng., MSc. R. Engr. (COREN)	Lecturer I	Full time
Mr. S. O. Adekomaya	ND, B.Eng., M.Sc., R. Engr. (COREN)	Lecturer I	Full time
Mr. S. O. Giwa	B. Eng., Dip. Comp. Eng., M.Sc., MCREN, R. Engr. (COREN)	Lecturer II	Full time
Dr. H.O. Adeyemi	B.Sc., MSc., Ph.D., R. Engr. (COREN)	Lecturer I	Full time

NON-TEACHINGSTAFF IN MECHANICAL ENINEERING PROGRAMME

Name	Qualification	Rank	Status
Mr. J. A. Ipadeola	Labour Trade Test Grade I, II & III, C & G London (ME Technician Part I, II & III), FTC (HND), PGDME, COREN Regd.	Chief Technologist	Full time
Mr. D.O.Fawole	Trade Test Grade One Certificate	Assistant Chief Technical Officer	Full time
Mr. B.S. Agboola	Craft Certificate	Technologist I	Full time

Mr. Adebayo	HND	Technologist II	Full time

ADMINISTRATIVE STAFF IN MECHANICAL ENINEERING PROGRAMME

Name	Qualification	Rank	Status
Mr Judah O.O.	Secretariat Studies Grade I, II,& III, O/Level	Senior Secretariat Assistant	Full time
Mr. O. Shobiye	WASC/SSCE	Clerical Staff	Full time

FACULTY-BASED GENERAL COURSES

FEG 201: ENGINEERING MATHEMATICS I (3 Units)
Limits continuity and differentiability of functions of one variable. Operational Processes: Differentiation and integration: Higher derivatives. Further techniques of integration; Physical applications of integration; Matrices and determinants. Elementary row operations. Echelon forms. Rank. Eigenvalues and Eigenvectors. Elementary vector space theory; Linear vector spaces and matrices; dimensionality of space; summation convention. Matrices and Linear transformations. Elementary complex Analysis: Complex number. The Argand diagram. Operation with complex number. Exponential and circular complex functions. Roots of units. De Moivre's theorem and applications.

FEG202: ENGINEERING MATHEMATICS II (3 Units)
Second Order Ordinary differential equations with constant coefficients, General theory of nth order linear equations, and line integrals, double integrals and their applications Laplace transforms- Definition of the Laplace transform of a function and derivation of the transform functions, inverse transforms, transforms of derivatives, transform to solve linear ordinary differential equations and system of simultaneous ordinary differential equations. Heaviside step function, the second shift property, Dirac delta function.

FEG205: INTRDUCTION TO COMPUTER PROGRAMMING (2 Units)
Introduction to computer system; Flowchart and basic data processing cycles; The mathematics of computing. Introduction to programming Languages: programming in QBASIC, FORTRAN and C++.

FEG203: ENGINEER – IN – SOCIETY (1 Unit)
Philosophy of science, History of Engineering Technology. Safety in Engineering and introduction to risk analysis. The role of Engineers in nation building. Invited lectures from Professionals.

FEG290 STUDENTS WORK EXPERIENCE PROGRAMME I (8 WKS)
A practical work programme, during the long vacation, arranged within the campus and its immediate environment to enable the students gain some basic skills in the profession of engineering in general and student's chosen field of engineering in particular.

FEG301: ENGINEERING MATHEMATICS III (3 Units)
Error analysis, Interpretation-its construction using both the Langrangian and Newton form; Numerical differentiation and Integration; trapezium and simpson's rule solution of system of linear algebra equations- Gaussian elimination with partial pivoting, jacobi and Guass- Seidel iterative method, conditions for convergence solutions of non linear equations, Numerical solutions to ordinary differential equation-Taylor series method, Euler's method and Runge-Kutta method, Use of computer packages –

implementation of a selection of algorithim from above sections using computer packages such as MATLAB and Maple.

FEG302: ENGINEERING MATHEMATICS IV (3 Units)
Mathematical modeling of physical systems numerical techniques, boundary value problems, Fourier series, Fourier transform, power series solution of ordinary differential equations, solutions of Laplace wave and heat equations by Fourier method.

FEG390: STUDENTS WORK EXPERIENCE PROGRAMME II (8WKS)
A more advanced industrial Programme; students this time are attached to appropriate Computer /Electrical / Electronics / Agricultural / Mechanical Engineering facilities and industries to further enhance practical approach to engineering through on-the job training.

FEG401: TECHNICAL COMMUNICATION (1 Unit)
Professional use of English Language for letters, specification, descriptions, presentation of charts, graphs, tables, writing of proposals in reports. Case studies of major professional presentation reports and proposals

FEG403: INTRODUCTION TO ENTREPRENEURIAL STUDIES (2 Units)
Definition of entrepreneurship, entrepreneurship, reasons for study, relevance to engineering graduates, relevance to the Nigeria and global economy- prevailing situations, entrepreneurship as root of corporate strategy. Definition of business and scope small-scale enterprises. Factors affecting/ qualities of entrepreneurship. Sources of finance – short-/long term. Finance statement: cash flow. Risk analysis. Business growth: Going concern.

FEG405: RESEARCH METHOD (1 Unit)
Descriptive statistics: mean, median, mode, chart and frequency distribution, probability and probability distribution, binomial distribution, linear and multiple regressions, correlation, Analysis of Variance and degree of confidence, Interpretation of statistical model, computer applications in statistics

FEG 490: STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME (24 WKS) (6 Units)
A comprehensive internship programme in which students spend a full semester in approved engineering establishments (private and public) and industries. The exposure also provide opportunity for students to sharpen their technical writing skill through field reports, keeping log – books and prepared technical documents under close supervision of industry-based professionals and lecturers.

FEG501: ENGINEERING ECONOMICS & ACCOUNTING (2 Units)
Law of management economics, management models, revenue of the firms, production decision, cost of production, profit analysis of the firms, pricing techniques location and localization of industries, industrial growth in Nigeria, the size of the firm integration and diversification marketing; demand and forecasting. Distributive trade in Nigeria, business finance, investment, capital budgeting and management control. Government policies and firm. Financing Technology: Capital equipment investment appraisal methods. Break even analysis. Budgeting and financial control. Fundamentals of cost accounting with emphasis on production costing. Areas of conflicts between Engineering valuation. Management: Oraganzational structure and behavior, engineer to engineer manager transition, managerial functions, principles and techniques of planning, forecasting organizing technical activities, project selection and management, style of leadership and management techniques.

FE502: ENGINEERING LAW & MANAGEMENT (2 Units)
Law, ethics and conduct in engineering. Legal definitions and specifications. Application of business law

to engineering. Industrial relations: Law of contract and engineering. Industrial relations: Law of contract and unionism, terms and conditions of employment. Intellectual property: patents, trademarks, copyrights, license and royalty. Contracts and contract documents, Technology transfer law. Safety and environmental regulations: health and safety law, environmental guidelines and laws. Technological responsibilities and liabilities: best practice, after sales. Technology impact assessment: effects on worker and staff, users and public safety, product lifetime and end of life disposal, legal and moral responsibilities. Role of the Engineer as a witness. Engineering business; types, the structure and functions of organizations. Management of engineer to manager transition. R & D management. Project selection and management. Capital investment policies. Technological collaborations: sub-contraction, consultancies, joint ventures and linkage programmes. Management of change and innovation.

COURSES FROM OTHER FACULTIES

FACULTY OF SCIENCE

CHM101: GENERAL CHEMISTRY I (4 Units)
Atoms, molecules and structures; State of matter; Energy and its effects; Enthalpies; Free Energy; Spontaneity of Process; Rates of Reaction; Equilibrium - General Dynamic Nature, Ionic Equilibria; Acid, Bases and salt; Oxidation and reduction in terms of electron transfer –reduction potentials, electro-chemical cells, corrosion of metals; Faraday's Law of Electrolysis.

CHM102: GENERAL CHEMISTRY II (4 Units)
Bonding and inter-molecular forces; The periodic table; Descriptive inorganic chemistry of main groups, I II, III and IV; 1 and 2 periodicity (s-block, p-block d-block f-block and noble gases); Brief introduction to Transition metals; Basic principles of Organic chemistry (first row). Nuclear Chemistry

(a) Qualitative and quantitative organic elemental analysis,(C,H,N,S halogens etc).
(b) Determination of molecular formula
(c) Functional group chemistry and classification of organic substances – hydrocarbons, alcohol, aldehydes and ketones, carboxylic acids.
(d) Polymer in everyday use.
(e) Carbohydrates, Lipids and proteins.

CHM104: EXPERIMENTA CHEMISTRY (2 Units)
Basic experiment drawn to reflect the contents of CHM101 & CHM102 course

PHY101: GENERAL PHYSICS I (4 Units)
Space and time, frame of reference, units, measurements and dimensions. Vectors, Kinematics: velocity and acceleration. Forces, mass and acceleration; Forces acting on a particle, and on a system of particle; statics of rigid bodies. Momentum; Integration of equation of motion. Energies of particles. Angular momentum.

PHY102: GENERAL PHYSICS II (4 Units)
Sound waves, Electromagnetic waves and their phenomena: Interference, Diffraction, Reflection and polarization. Geometrical Optics; Electrostatics - Electric charges and fields, Gauss law, Electric potential, Conductors and dielectrics in electrostatics; Electric current and resistance. Electric circuits; The forces exerted by a magnetic properties of matter. Maxwell's equations. Electromagnetic oscillations

and waves; Applications; Elementary modern Physics- Bohr's Theory, Photoelectric effect, De Broglie equation and elementary semiconductor physics.

PHY151: EXPERIMENTAL PHYSICS I (1 Unit)
Introductory experiments in general measurements and error analysis, simple experiments in mechanics and properties of matter. Heat and Thermodynamics.

PHY152: EXPERIMENTAL PHYSICS II (1 Unit)
Basic experiment drawn to reflect the contents of PHY102 course; Some elementary Modern Physics experiments are also included.

STA101: ELEMENTARY STATISTICS (2 Units)
Generation of statistical event from set theory and combinatorial methods; Elementary principles of probability; Types and distribution of random variables; the binomial, poison, hyper geometric, normal distributions; Expectations and moments of random variables; probability sampling from tables of random numbers; selected application.

GENERAL STUDIES (GNS) COURSES

GNS101: COMMUNICATION IN ENGLISH (2 Units)
Effective communication and writing in English, Language skills, writing of essay answers, Comprehension, Sentence construction, Outlines and paragraphs, Collection and organization of materials and logical presentation, Punctuation. Logical presentation of papers, Phonetics, Instruction on lexis, Art of public speaking and oral communication, Figures of speech, Précis, Report writing.

GNS102: STUDY SKILLS & INFORMATION COMMUNICATION TECHNOLOGY (ICT) (2 Units)
Brief history of libraries, Library and education, University libraries and other types of libraries, Types of library materials, using library resources including e-learning, e-materials; etc, Understanding library catalogues (card, OPAC, etc) and classification, Copyright and its implications, Database resources, Bibliographic citations and referencing, studying and learning, writing skill, remembering and forgetting, memory improvement techniques, continuous assessment, preparation for exams, note-making etc. Development of modern ICT, Hardware technology Software technology, Input devices, Storage devices, Output devices, Communication and internet services, Word processing skills (typing, etc).

GNS103: HISTORY AND PHILOSOPHY OF SCIENCE (2 Units)
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 material, Chemical and radiochemical hazards. Introduction to the various areas of science and technology. Elements of environmental studies.

GNS104: PHILOSOPHY AND LOGICAL THINKING (2 Units)
A survey of the fundamental questions and problems of philosophy. What Philosophy is, and what philosophy is not. Relevance of philosophy to sciences, medicine, Technology, Agriculture, Education, Law, Politics, Cultural Norms and Values, etc. Introduction to symbolic logic-conjunction, negation, affirmation, disjunction, equivalence and conditional statements. The laws of thought. The methods of deduction using rules of inference. The logic of induction and deductive inferences. Argument by analogy, agreement and disagreement, sophistical refutations etc.

GNS105: MODERN AGRICULTURE AND RURAL DEVELOPMENT
(2 Units)

Sociology of Nigerian Rural Areas, Economic Opportunities in Agriculture, Cultural Practices and Crop Production Systems in Nigeria, Livestock Production and Management, Introductory Agriculture and Small Scale Fish Production, Farm Management, Agricultural Extension and Teaching Method, Introduction to Human Nutrition and Food Science, Introduction to Forestry and Wildlife, Farm Practical.

GNS201: NIGERIAN PEOPLES AND CULTURE (2 Units)

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

GNS202: PEACE STUDIES AND CITIZENSHIP EDUCATION
(2 Units)

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

GNS203: COMMUNICATION IN FRENCH (2 Units)

Introduction to French, Alphabets and numeric for effective communication (written and oral), Conjugation and simple sentence construction based on communication approach, Sentence construction, Comprehension and reading of simple texts.

GNS204: INTRODUCTION TO ENTREPRENEURSHIP SKILLS
(2 Units)

Some of the ventures to be focused upon include the following: Farming, Soap/Detergent, Photography, Fisheries/Aquaculture, Bakery, Interior decoration/Hat and Bead Making, Tailoring and Dry Cleaning , Printing, Farming, Water treatments, Tie and dye and Animal husbandry (Poultry, Piggery, Goat etc).

GNS205: ENTREPRENEURIAL STUDIES (2 Units)

Introduction to entrepreneurship and new venture creation; Entrepreneurship in theory and practice; The opportunity, Forms of business, Staffing, Marketing and the new venture; Determining capital requirements, Raising capital; Financial planning and management; Starting a new business, Feasibility studies; Innovation; Legal Issues; Insurance and environmental considerations. Possible business opportunities in Nigeria.