DEPARTMENT OF FOOD ENGINEERING
FACULTY OF ENGINEERING AND TECHNOLOGY

UNIVERSITY OF ILORIN
ILORIN, NIGERIA

STUDENTS HANDBOOK (UNDERGRADUATE)

DEPARTMENT OF FOOD ENGINEERING

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STUDENTS HANDBOOK (UNDERGRADUATE)

OCTOBER 2025

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FOREWORD

The Department of Food Engineering was established during the 2014/2015 academic session following its separation from the Department of Agricultural and Biosystems Engineering. The first set of students was admitted in the same session for the award of the Bachelor of Engineering (B.Eng.) degree in Food Engineering. The programme is being aligned with the Benchmark Minimum Academic Standards (BMAS) of the National Universities Commission (NUC) and the professional requirements of the Council for the Regulation of Engineering in Nigeria (COREN).

The Department is committed to advancing the application of engineering principles in food production, processing, preservation, and value addition. Its objective is to contribute to national development by addressing challenges related to food security, industrial growth, and sustainable practices.

The programme emphasizes core areas of Food Engineering, including Machine Design, Food Process and Plant Design, Storage and Packaging, Bioprocess Engineering, Food Standard and Quality Control, and Biotechnology. Graduates are trained to meet the demands of the food industry and allied sectors through innovative and practical engineering solutions.

The students' handbook for undergraduate further detailed the history of our programme, philosophy and objectives of our programme, training facilities, admission requirements, course structure and synopsis among other details.

Dr. M. S. Sanusi
Ag. Head of Department
October 2025

FACULTY OF ENGINEERING AND TECHNOLOGY

History of the Faculty of Engineering and Technology, University of Ilorin

The Faculty of Engineering and Technology at the University of Ilorin was established in September 1978, with the primary objective of providing a robust institutional framework for training engineers capable of driving the technological development of Nigeria and the world. From its inception, the faculty has fostered a conducive environment for the education of undergraduate engineering students and has facilitated cutting-edge research activities among its academic staff. Over the years, the faculty has expanded its programs to include postgraduate training, offering master's and doctoral degrees in various engineering disciplines.

Departments and Growth

At its founding, the faculty started with three departments: Civil Engineering, Electrical Engineering, and Mechanical Engineering, alongside a Central Engineering Workshop, which was established in 1979 to provide hands-on training and practical experience to all engineering students. The faculty's academic and research programmes were designed to attract students with strong backgrounds in mathematics and physical sciences, with an emphasis on logical, imaginative, and creative problem-solving skills.

The faculty's commitment to academic excellence and research has led to the expansion of its programmes over the years. In 1982, the Department of Agricultural Engineering was

established as the faculty's fourth department. Subsequent additions include:

- Department of Chemical Engineering (2008/2009)
- Department of Materials and Metallurgical Engineering (2010)
- Department of Water Resources and Environmental Engineering (2013)
- Department of Computer Engineering (2014)
- Department of Biomedical Engineering (2015)
- Department of Food Engineering (2014/2015)

As of the 2020/2021 academic session, the Faculty of Engineering and Technology had grown to host 3,351 undergraduate students across its ten departments. The faculty has been led by a series of distinguished Deans since its inception. Below is a list of the past and present Deans:

1. Prof. V.O.S. Olunloyo (Mechanical Engineering, 1978-1980)
2. Prof. I.E. Owolabi (Electrical and Electronics Engineering, 1980-1984)
3. Prof. B.J. Olufeagba (Electrical and Electronics Engineering, 1984-1988)
4. Prof. S.O. Adeyemi (Civil Engineering, 1988-1990)
5. Prof. J.S.O. Adeniyi (Mechanical Engineering, 1990-1994)
6. Prof. F.L. Bello-Ochende (Mechanical Engineering, 1994-1998)

7. Prof. K.C. Oni (Agricultural and Biosystems Engineering, 1998-2001)
8. Prof. O.A. Adetifa (Civil Engineering, 2001-2005)
9. Prof. B.F. Sule (Civil Engineering, 2005-2009)
10. Prof. J.O. Olorunmaiye (Mechanical Engineering, 2009-2013)
11. Prof. Y.A. Jimoh (Civil Engineering, 2013-2017)
12. Prof. D.S. Ogunniyi (Chemical Engineering, 2017-2021)
13. Prof. O.A. Lasode (Mechanical Engineering, 2021-2023)
14. Prof. J.K. Odusote (Materials and Metallurgical Engineering, 2023 - 2025)
15. Prof. J.O. Olaoye (Agricultural and Biosystems Engineering, 2025 – Present)

The faculty has also benefited from the support of dedicated administrative staff, including several Senior Registry staff who have served as Faculty Officers. These officers play a crucial role in facilitating the activities of students from admission to graduation and supporting staff from recruitment to retirement. Notable present Faculty Officers include Mrs. Docars D. Adu, Muktar Lukman Abiodun, A.B. Shuaib, Oluseun Jolayemi, A.J. Anate, Abdulateef Bello, Hassana Adegbite, Dr. A.S. Alawaye, A.O. Shuaib, Grace A. Abajo, Mrs. Adeniyi, Adetola Oluwakemi, J.K. Omotosho, Mrs. Nimotallahi Ismail, Lamidi Helen and A.M. Adisa who currently serves in the role. The Faculty of Engineering and Technology hosts an annual international conference known as the Faculty of Engineering and Technology International Conference (FETiCON). Additionally,

the Faculty publishes the Nigerian Journal of Technological Development, a Q4 journal indexed in Scopus and Scimago, which highlights research and innovations in engineering and technology.

The Faculty of Engineering and Technology continues to strive towards improving the quality of education and research offered to its students. Through regular curriculum reviews and a focus on innovative research, the faculty aims to remain at the forefront of engineering education in Nigeria and beyond, contributing to both national development and the global engineering community.

VISION STATEMENT

To be a world-class Engineering and Technological centre for innovations in learning, research, probity and service to humanity.

MISSION STATEMENT

To provide Engineering and Technological environment for learning, research and community service.

SHORT HISTORY OF THE DEPARTMENT

The Department of Food Engineering was established during the 2014/2015 academic session from the Department of Agricultural and Biosystems Engineering. It is the tenth department in the Faculty of Engineering and Technology. The pioneer students admitted to 100 level were forty-five (45) in number. The department has successfully graduated six (6) sets as of 2024/2025 academic session. The pioneer Head of Department (HOD) was Dr. J. O. Olaoye (now a Professor), and was succeeded by Dr. M. O. Sunmonu (now a Professor) and then Dr. M. M. Odewole. The current HOD is Dr. M.S. Sanusi. The Food Engineering programme is designed to capture the essential features of both food science and engineering education. The programme is structured to specifically advance food equipment development, innovate and assess novel food products, as well as design and assessment of manufacturing processes and systems specific to food production and other related activities.

VISION STATEMENT

To be a leading centre of excellence in Food Engineering, dedicated to advancing learning, research, innovation, and ethical practices, while contributing to sustainable food systems and serving humanity.

MISSION STATEMENT

To provide a world-class environment for advancing knowledge in Food Engineering, fostering innovative research, and engaging in community service to address national and global food challenges.

INTRODUCTION

Food Engineering is the application of science and engineering principles to the evaluation, utilization, processing, packaging, distribution and storage of food products. Food and Bioprocess Engineering is relatively a new field of study as an academic discipline; however, it has been studied for many generations. For example, fish and meat preservation and the dairy industry have been worked on for thousands of years. Food canning and edible oil processing at factory level go back for only about one hundred and seventy years. Food and Bioprocess Engineering is the latest branch of Agricultural and Biosystems Engineering that is highly developed in the United States of America.

The Food Engineering studies are designed to give students a thorough grounding in food chemistry, food microbiology, quality control, food processing, food packaging, food storage, factory operations, food administration, food safely, food laws and unit operations. The programme also include courses in biochemistry, analytical chemistry, chemical engineering, nutrition, home economics, food science, statistics, selected courses in basic engineering principles such as fluid mechanics, thermodynamics, energy conversion and material science. Others include courses in agriculture and general livestock production. Food and Bioprocess Engineering is more involved in the design of process equipment and processing machines.

The programme of study presented here aims at providing adequately trained and qualified staff (skilled and competent professionals) in various areas of food enterprise. This includes academia, research institutes and manufacturing industries such as food canning and edible oil processing factories, beverage industries, etc.

PHILOSOPHY

The philosophy of the programme therefore is to promote, within the student, the science and art of engineering in food technology and to build in them capacity for high sense of self-reliance, coupled with sound academic and practical discipline towards the attainment of the

national goals and objectives of rapid industrialization, food self-sufficiency and technological emancipation.

OBJECTIVES

The aim of Food Engineering training is to meet national needs and aspirations vis-à-vis industrial development and technological emancipation. the minimum standards specified by NUC are to meet these needs and produce graduates in Food Engineering with sufficient academic background coupled with sufficient practical experience. These graduates are to rise up to the challenges of a developing economy. Such graduates are to be resourceful, creative and innovative and must be able to perform the following functions:

i conceive, design and engineering projects and supervise their construction and installation;
ii conceive, design and build components, machines, equipment, structures, processes and systems;
iii design and develop new products and production techniques for food industries;
iv install and maintain complex engineering systems so that they can perform optimally in our environment; and
v adapt and adopt exogenous technology in order to solve local engineering problems.

RATIONALE

With a unique understanding of the interrelationships between technology and living systems, Food Engineering Programme prepares students with opportunities to have a wide variety of employment options available. The unique curriculum offers valuable experience in related engineering disciplines and prepares graduates for multi-disciplinary teams common in today's workforce. The programme equips graduates with diverse practical, efficient solutions for food packaging, storage, delivery and preparation and food biotechnology. This results in many jobs in the food industry for individuals with knowledge of chemistry, engineering and microbiology. Food Engineers evaluate, design, modify, improve and economize the processing and distribution of food, feed and fiber. Careers in process engineering, product development, research, sales and marketing are

available to graduates who understand the science and engineering of food manufacture, storage and distribution

A graphic understanding of the interrelationships between technology and living systems provide a wide variety of employment options as Food processing engineer, Food research engineer; Food production manager; Bioprocess engineer; Bioproducts development engineer; Biofuel consultant engineer and Bioenergy engineer

TRAINING FACILITIES

The training workshop for the Department of Food Engineering is currently being developed. However, the Food Engineering Pilot processing plant for teaching, research and industrial projects is fully established in the department. This is necessary for the evaluation of new ingredients, formulations and processes on a small scale and also for laboratory and equipment demonstration. The department share some facilities with the Department of Agricultural and Biosystems Engineering. There are other shared Lecture Rooms located in Block 7 and 10 including three main shared Lecture Theaters (NELT I, NELT II, ELT, ELH,LT III and LTIV).

At the moment, eight core laboratories are being developed to strengthen the Department's infrastructure. These include:

1. FDE Pilot Plant I
2. Food Analytical Laboratory
3. Bakery-Pilot Plant II
4. Grains Processing/Milling Plant
5. Sensory and Training Room
6. Food Engineering Pavilion for outdoor processing
7. Food Equipment Fabrication/Maintenance Workshop
8. The Food Chemistry and Food Microbiology laboratories are adequately supported by facilities domiciled in the University Central Research Laboratory.

Other shared Laboratories are located in Block 7 and 9. These include: Hydrology Laboratory; Wood Workshop Laboratory; Mechanics of Material Laboratory; and Fitting Workshop. In addition, there are University Central Workshop, Drawing Studio and Faculty Computer Laboratory.

ADMISSION REQUIREMENTS

Entry Requirements

(i) Unified Tertiary Matriculations (UTME) Candidates:

UTME Candidates are required to obtain "O" Level credits in five subjects which should include Mathematics, Physics, Chemistry, English Language and Biology. It is also desirable for candidates to have Further Mathematics and Technical Drawing at credit levels. Such Candidates shall have added advantage. Candidates are also required to have an acceptable minimum national pass mark in UTME. The UTME subjects are Mathematics, Physics and Chemistry. In addition, such Candidates must meet the cut-off mark in the University Post Jamb Examination.

(ii) Direct Entry (DE) Candidates into 200 Level:

In addition to (i) above, DE Candidates are required to have A- Level / IJMB or approved equivalent pass in Mathematics (Pure, Applied or Pure and Applied), Physics and Chemistry or a national Diploma in Agricultural Engineering or a relevant Engineering discipline at distinction or Upper Credit level from a recognized Polytechnic or College of Technology plus at least one year Post ND Experience. Also, candidates coming in with IJMB or JUPEB must have at least 10 points, with no failure (F) in any of the three ssubjects (Physics, chemistry and mathematics). Candidates with First degree from Physical Sciences of not less than Second Class Lower Honours may be admitted into 200 Level. In addition, such Candidates must meet the cut-off mark in the University Post Jamb Examination.

(iii) Direct Entry (DE) Candidates into 300 Level:

In addition to (i) and (ii) above, DE Candidates in this category are required to possess a Higher National Diploma (HND) in Agricultural Engineering or a relevant Engineering Discipline, at distinction or Upper Credit level from a recognized Polytechnic or College of Technology. Candidates with First degree in Engineering discipline may be admitted into 300 level of any other Engineering Programme. In addition, such Candidates must meet the cut-off mark in the University Post Jamb Examination. *This category of admission will be based on application for upgrading to 300 level after 200 level DE*

entry. Consideration for the 300 level after application is at the discretion of the Department.

The admission requirement for faculty of Engineering and Technology are as follow:

Course	Requirements		UTME subjects	Special Consideration (Waiver Remarks)
	DE	UTME		
Engineering	In addition to 'O' level and Post-UTME requirements, candidate must have either of the following (i) 'A' level IJMB or JUPEB or approved equivalent pass in Mathematics, (Pure or/and Applied), Physics, and Chemistry with a minimum	UTME candidates are required to obtain "O'Level credits in Five (5) subjects which should include English Language, Mathematics, Physics, Chemistry and any other approved relevant subject	English Language, Mathematics, Physics, Chemistry.	**Direct Entry:** In addition to 'O' level and Post-UTME requirements, candidates with any of the following qualifications may be considered: (i) HND in a relevant Engineering discipline at lower Credit level from recognized Polytechnic or College of Technology after NYSC may be admitted into 200 level.

	of 10 points (ii) OND (Upper Credits) in **Relevant Discipline** with at least one year post diploma experience .			(ii) First Degree from Physical Sciences at Honours level may be admitted into 200 level (iii) HND in relevant Engineering discipline, at Distinction or Upper Credits level from recognized Polytechnic or College of Technology after NYSC may be admitted into 300 level. (iv) First Degree Honours (at least 2nd Class lower) in relevant Engineering disciplines may be admitted into 300 level, if upgrading at the discretion

				of the department is granted after application. **UTME:** Candidate who passed Further Mathematics and Technical Drawing at Credit levels stand at an advantage.
Department of Food Engineering		Five 'O' level credit passes to include Physics, Chemistry, Mathematics, Biology and English Language		**Direct Entry: Relevant Discipline include-** Agricultural Engineering Technology, Food Technoloy, Chemical Engineering Technology, Electrical Engineering Technology, Mechanical Engineering Technology, Mineral Processing Engineering Technology, and Post

				Harvest Engineering Technology.

DURATION

The programme will run on full-time basis for a minimum of ten (10) semesters for UME students and minimum of eight (8) semesters for Direct Entry students. The students will be expected to go for industrial trainings during 300 l long vacation and for a semester in 400 level. A maximum of fourteen (14) semesters for UME students and twelve (12) semesters for Direct Entry students is allowed.

RECOMMENDED COURSES FOR THE PROGRAMME BY LEVEL

100 LEVEL COURSES

HARMATTAN SEMESTER			**RAIN SEMESTER**		
Course Code	**Course Title**	**Course Credit**	**Course Code**	**Course Title**	**Course Credit**
MAT 111	Elementary Mathematics I	3	MAT 112	Elementary Mathematics III	3
MAT 113	Elementary Mathematics II	3	MAT 114	Elementary Mathematics IV	3
PHY 115	Mechanics and Properties of Matter	2	PHY 142	Atomics Physics	2
PHY 125	Heat, Sound and Optics	3	PHY 152	Electricity and Magnetism	3
PHY 191	Practical Physics I	1	PHY 192	Practical Physics II	1

CHM 101	General Physical Chemistry	3	CHM 112	General Organic Chemistry	2
CHM 115	General Practical Chemistry I	2	CHM 116	General Practical Chemistry II	1
STA 131	Introduction to Statistics	2	CHM 132	General Inorganic Chemistry	2
GNS 111	Reading and Study Skills	2	STA 124	Introduction to Probability	2
			GNS 112	Use of English	2
			GNS 114	Digital literacy	1
Total		**21**	**Total**		**22**

200 LEVEL COURSES

HARMATTAN SEMESTER			**RAIN SEMESTER**		
Course Code	**Course Title**	**Course Credit**	**Course Code**	**Course Title**	**Course Credit**
ELE 201	Applied Electricity I	3	ELE 202	Applied Electricity II	3
MEE 217	Engineering Graphics I	2	MEE 218	Engineering Graphics II	2
MEE 235	Engineering Technology	2	CHE 242	Fundamentals of Thermodynamics	3
CHE 241	Fundamentals of Fluid Mechanics	3	CVE 254	Engineering Mechanics II	3
CVE 253	Engineering Mechanics I	3	ABE 264	Engineering Maths I	3

FBE 263	Engineering Mathematics I	3	ELE 276	Computer Application II	2
ELE 275	Computer Application I	1	MEE 272	Engineering Materials	2
ABE 283	General Eng. Laboratory Course I	2	FBE 284	General Eng. Laboratory Course II	2
GNS 211	Introduction to Humanities	2	GNS 212	Introduction to Social Science & Citizen Education	2
			GSE 202	Graduate Entrepreneurship Skills I	2
			FBE 206	Introduction to Engineering Disciplines	2
			FBE 222	SWEP	6
Total		**21**	**Total**		**26**

300 LEVEL COURSES

HARMATTAN SEMESTER			**RAIN SEMESTER**		
Course Code	**Course Title**	**Course Credit**	**Course Title**	**Course Code**	**Course Credit**
FBE 301	Food Manufacturing Techniques I	2	FBE 302	Food Manufacturing Techniques II	2

FBE 303	Food Engineering I	2	FBE 304	Food Engineering II	2
FBE 305	Heat and Mass Transfer	2	FBE 308	Biorefining Engineering	2
FBE 311	Food Chemistry	3	FBE 312	Food Microbiology	3
FBE 313	General Microbiology	2	FBE 314	Human Nutrition	3
FBE 383	Food Engineering Laboratory Course I	1	FBE 384	Food Engineering Laboratory Course II	1
GNS 311	History and Philosophy of Science	2	*FBE 392	Students' Industrial Work Experience Scheme I (SIWES) I	6
MEE 361	Engineering Mathematics III	3	MEE 362	Engineering Mathematics IV	3
AGY 301	Crop Production for Engineers	2	ABE 376	Engineering Communication	1
ANP 307	Animal Production for Engineers	2	ABE 306	Engineering Economics	3
GSE 301	Graduate Entrepreneurship Skills	2			
Total		**23**	**Total**		**20**

***FBE 392 is taken during Rain Semester and Long Vacation after 300 Level. It is not used for CGPA computation, but must be passed.**

400 LEVEL

400 LEVEL COURSES

	HARMATTAN SEMESTER			RAIN SEMESTER	
Course Code	**Course Title**	**Course Credit**	**Course Code**	**Course Title**	**Course Credit**
FBE 405	Food Biotechnology	3	FBE 492	Industrial Training II	12
FBE 407	Principles of Food Analysis I	3			
FBE 409	Cereals and Tuber Technology	2			
FBE 411	Fermentation Technology	3			
FBE 413	Design of Food Machinery	3			
FBE 481	Food and Bioprocess Engineering Laboratory Course III	2			
*FBE 492	Students' Industrial Work Experience Scheme II (SIWES) II	12			
ABE 463	Engineering Statistics	2			

	* An Approved Elective	3			
Total		**21**			

***FBE 492 is taken during Rain Semester and Long Vacation after 400 Level. It is not used for CGPA computation, but must be passed.**

Approved Elective: One course to be selected from the following list depending on the option of the students

Course Code	Course Title	Course Credit
MEE 421	Mechanics of machine II	3
ABE 537	Bioprocess Engineering	3

500 LEVEL COURSES

HARMATTAN SEMESTER			RAIN SEMESTER		
Course Code	**Course Title**	**Course Credit**	**Course Code**	**Course Title**	**Course Credit**
COMMON COURSES					
FBE 501	Food Standards and Quality Control	3	FBE 502	Food Process Design	3
FBE 503	Food Process Plant Design and Economics	2	FBE 506	Meat and Meat Products Technology	3
FBE 505	Milk and Dairy Technology	3	FBE 522	Engineering Measurement Systems	3

FBE 523	Process Control and Automation	3	FBE 524	Processing of Miscellaneous Food Commodities	3
FBE 541	Food Packaging Engineering	3	FBE 582	Food Engineering Lab. Course V	1
FBE 581	Food Engineering Lab. Course IV	1	FBE 594	Food Engineering Research Project I	4
FBE 593	Food Engineering Research Project I	4	BUL 506	Engineering Law	3
ABE 501	Engineering Management	3			
ABE 573	Engineer in Society	1			
	***TOTAL**	**23**			**20**
* Total Credit offered per Semester without 3 Credits of Departmental					

APPROVED DEPARTMENTAL ELECTIVES					
FBE 511	Biochemical engineering II	3	FBE 534	Application of solar energy to processing and storage of agricultural and biological materials	3
FBE 555	Biological Nano – Engineering				

Elective that could be offered in either Harmattan or Rain Semester

* Note that all students are expected to offer and pass only 3 credits of Departmental Elective at 400 Level and minimum of 3 Credits of Departmental Elective at 500 Level which could be taken in either harmattan or rain Semester.

DEPARTMENTAL FOCUS

To be a good Food Engineer that would make positive and relevant contributions to the society. Our focus is to facilitate our graduates to posses such important qualities such as:

i) create individual with special interest in industrial sector
ii) develop potentials in individual who must have strong passion for research
iii) induce an individual to be versatile because the profession cuts across many fields of learning
iv) facilitate minds that strive for strong problem-solving abilities
v) and to develop in an individual mind that must be able to properly relate with people from different walks of life.

INDUSTRIAL TRAINING

The Industrial Training aspect of the programme is divided into four parts. The first part is the Students' Work Experience Programme (SWEP) which is held at the end of 200-Level just during the end of session break in the Faculty's workshop practice and have a "hand-on" experience of practical engineering. This serves as a channel for integrating in-house entrepreneur development and skill into our programme. The three other parts of the Industrial Training expose the students to real-life situations in engineering or related establishments within and outside the country.

REGISTRATION OF COURSES

Courses for the season are registered on-line at the beginning of the season. In addition, a student is required to go to his/her level adviser after the on-line registration in order to complete the registration process. Failure to register before the deadline as stipulated by the university may result in loss of that session or voluntary withdrawal from that programme. A student cannot re-register for a course already passed.

REQUIREMENTS TO PROCEED FROM 100 LEVEL TO 200 LEVEL

In order for a student to proceed from 100 Level to 200 Level in the Faculty of Engineering and Technology (FET), the following minimum requirements must be met at the end of 100 Level.

(i) The student must satisfy the 9-9-6 requirement, that is, a student must pass:
   (a) 9 Credits of Mathematics
   (b) 9 Credits of Physics
   (c) 6 Credits of Chemistry

(ii) A minimum Cumulative Grade Point Average (CGPA) of 2.00

STANDARD OF TESTS AND EXAMINATIONS

Examination questions are set by the lecturer(s) assigned to teach the courses. It is mandatory for the examinations questions in all courses to

be internally reviewed and in addition to be externally moderated in case of 500 level courses. Lecturers submit their question papers along with model answers under strict confidential cover to the Head of Department (the Departmental Chief Examiner) who, together with the concerned lecturer and his sectional head, reviews each question paper to ensure that it conforms to standard. Once satisfactorily reviewed and corrected, the question papers are processed under the confidentiality by the Head of Department, with the assistance of the departmental Examination Officer, either for onward transmission to the external examiner and kept in safe custody by the Examination Officer, pending a few hours before the time of the examination.

Final year examination questions are particularly moderated by the External Examiners who are seasoned, experienced and long-standing professionals. At the end of every session, External Examiners are invited to examine (vet) question papers, results, project reports and conduct project defense for final students in the department.

GRADING SYSTEM

The university operates a 5-point grading system in which the Continuous Assessment takes at least 30% and examination 70% as the case may be in each course for each semester. The Continuous Assessment is made up of class attendance /quiz / test / assignment as applicable. In addition, a student must satisfy a minimum of 70% attendance at lectures before being allowed to sit for examination in the respective course.

The range of scores and the corresponding letter grades are as shown in Table below

Grade	Grade Point	Range of Scores (%)
A	5.0	70 and above
B	4.0	60 – 69
C	3.0	50 – 59
D	2.0	45 – 49
E	1.0	40 - 44
F	0.0	Less than 40

CLASSIFICATION OF DEGREES

The Bachelor of Engineering (B. Eng) degree in Food Engineering is awarded in the First Class Honours, Second Class Honours (Upper Division), Second Class Honours (Lower Division), Third Class Honours and Pass depending on the Cumulative Grade Point Average (CGPA) at the point of graduation and as shown in the Table below

Class of Degree	Range of CGPA
First Class Honours	4.50 – 5.00
Second Class Honours (Upper Division)	3.50 – 4.49
Second Class Honours (Lower Division)	2.40 – 3.49
Third Class Honours	1.50 – 2.39
Pass	1.00 – 1.49

JOB OPPORTUNITIES

Job opportunities are available in food industries. Professional food engineers are employed as plant managers, supervisors, sales personnel and research officers in the food industries. They are also involved in development of new food products and/or improved food products and equipment. Federal and State Governments require the services of Food Technologists as field supervisory and inspection personnel and to protect the consumer through development and application of effective analytical food testing methods needed to back up the food and drug act. They can also work in private enterprises. The training that they will be provided will be such that individual who wishes to establish his own industry can do so with ease. There are many struggling food industries in Nigeria that can become successful food industries given management and supervision/personnel with technological "know-how". After earning relevant degrees, a graduate of Food Engineering can join the distinguished career of academics and research in universities, research institutes and other allied institutions.

OUTCOMES OF THE PROGRAMME

The researcher in Food Engineering will be exposed to Fiber optic sensor development, Food process automation, Bio separation processes Mathematical modeling of bioprocesses, and Grain processing among others. Most of our Food and Bioprocess Engineers work in large or small companies that are involved in one or more of the following: processing, packaging and distribution of dairy, meat, poultry and seafood products; canning and freezing fruits and vegetables; drying and storing cereal grains, oilseeds and other feed stuffs; preparing and distributing confectioneries, snacks, baked foods and beverages; designing and testing machines and instruments; sensing and controlling temperature, pressure, moisture, sugar, among others and development of new foods and processes.

ORGANIZATION CHART OF THE UNIVERSITY / DEPARTMENT

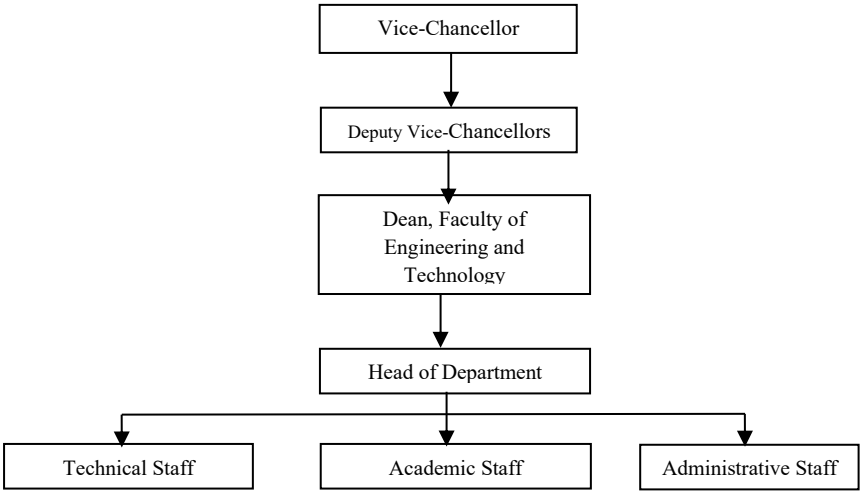

Fig. 1. Abridged Organisation Chart

ADMINISTRATIVE RESPONSIBILITIES IN THE DEPARTMENT

1. Head of Department
2. Sectional Heads
3. Postgraduate Programme Coordinator
4. Examination Officer
5. Seminar Coordinator
6. Final Year Project Coordinator
7. SIWES Representative
8. SWEP Representative
9. COBES Representative
10. 100 - 500 Level Advisers

STAFF LIST DEPARTMENT OF FOOD ENGINEERING

S/ No.	NAME	RANK	QUALIFICATION	AREA OF SPECIALIZATION
1.	M.S. Sanusi	SL and Ag. Head	B.Tech (Ogbomoso), M.Sc., Ph.D (Ibadan), MNSE, MASABE, MNIFST, R.Engr. COREN, MNIAE	Food Engineering and Product Development
2.	M. O. Sunmonu	Prof.	B.Eng., M.Eng., PhD (Minna), MNIAE, MASABE, R. Engr. COREN	Food Storage and Packaging
3	J.O. Olaoye	Prof.	B.Eng., M.Eng., Ph.D. (Ilorin), MNSE; FNIAE; MASABE; R.Engr. COREN, MISTRO	Postharvest Engineering
4	Temitope Odetoye E.	Prof.	B.Tech. (Ogbomoso), M.Sc. (Ilorin), Ph.D (Ilorin), Ph.D. Chemical Engineering, (Ogbomoso), FNSE, R.Engr. (COREN), MNSChE	Biofuel and Sustainable Production

5	R. Akinoso	Prof.	B.Tech., M.Tech., Ph.D. (Ibadan) MNIAE, MNSE, MASAE, MNIFST, R. Eng. (COREN)	Food Engineering
6	T.A. Shittu	Prof.	B.Tech., M.Tech., Ph.D. (Ibadan), MNSE, MASAE, MNIFST	Food Processing and Storage Technology
7	Grace O. Ogunlakin	Prof.	B.Tech (Ogbomoso)., M.Sc (Abeokuta)., Ph.D (Ogbomoso); MNSE, MNIFST, R.Engr. COREN	Food Engineering
8	M.M. Odewole	Reader	B.Eng., M.Eng (Ilorin), Ph.D. (Akure), MNIAE, MNSE, MASABE, R. Eng. COREN	Food Processing and Storage Engineering
9	M. O. Iyanda	SL	B.Eng., M.Eng., Ph.D (Ilorin). MNIAE, R.Engr. (Nigeria)	Farm Power and Machinery
10	O.T. Popoola	SL	B.Eng. (Kano), M.Eng., Ph.D. (Ilorin) R.Eng (COREN)	Production Design
11	Ester O. Babatunde	SL	B.Tech. (Ogbomoso); M.Eng., Ph.D. (Minna); R.Engr.	Process Engineering

			CORENMNSChE	
12	Mary A. Ajala	SL	B.Tech., M.Sc. (Ogbomoso), Ph.D. (Minna), R.Engr. MNSChE	Materials development
13	O.S. Zakariyyah	SL	B.Eng. M.Eng. Ph.D. (Ilorin) R.Eng (COREN)	Electronics and Telecommunication
14	K. O. Abdulraham	SL	B.Eng. (Minna), M.Sc. (Derbyshire), Ph.D. (Johannesburg) R.Eng. (COREN)	Design and Manufacturing
15	H. U. Hambali	SL	B.Eng. (Maiduguri); M.Sc. (Zaria); Ph.D. (Johor Bahru); R.Engr. (COREN), MNSChE, MNSE	Solid waste and water management
16	Tunmise L.Adewoye	SL	B. Eng. (Minna), M. Tech. (Ogbomoso), Ph.D. (Ogbomoso); R.Engr. COREN MNSE; MNSChE	Nanotechnology
17	S. I. Mustapha	SL	B.Eng. (Minna); M.Sc. (Zaria), Ph.D. (DUT, South Africa); R.Engr. COREN, MNSChE,	Process Modelling and Simulation

			MNSE, MNSCE, MIChemE	
18	S. Saminu	SL	B.Eng. (KUST-WUDIL); M.Sc. (YASAR); Ph.D. (Hebei, China); R.Eng. COREN	Bio-Signal Processing, Artificial Intelligence and Medical Instrumentation
19	Abiola L. Adepoju	L I	B.Tech (Ibadan); M.Eng (Minna); Ph.D. (Ogbomoso) MNIAE, MASABE, R. Engr. COREN	Post-harvest processing of Bio-Materials
20	Zainab T. Yaqub	LI	B.Sc. (Lagos); M.Tech., Ph.D. (Johannesburg), MNSChE, R.Engr. (COREN)	Energy Décarbonisation. Life Cycle Analysis, Techno-Economic Analysis
21	Khadijah O. Salami	LI	B.Sc. (Kogi), M.Sc. (Ibadan; Ilorin), Ph.D. (Ibadan) M.Sc. (Ilorin), MNISEB), MNIFST	Food Processing and Preservation
22	M.A. Amoloye	LI	B.Eng. (Bauchi); M.Tech. (Ogbomoso) Ph.D. (Ilorin); R.Engr. COREN	Design and Process Optimization

			MNSChE	
23	Y. O. Babatunde	LI	B.Eng., M.Eng. (Ilorin); Ph.D. (PAUSTI, Kenya); R.Engr. COREN MNSE, RILEM	Structural Materials
24	Taiye M. Ajibola	LI	B.Eng. (Ilorin), M.Eng. (Ilorin), R. Engr. (COREN)	Bioinstrumentation and Controls, Bio-signal Processing, Robotics.
25	A. Adesina	L II	B. Engr. (Ilorin); M.Sc. (IT, Wolves, UK). R. Engr. (COREN)	Computer Engineering
26	J. Adegbola	L I	B.Eng. M.Eng. (Ilorin). R. Engr. (COREN)	Composites Development and Characterization
27	Mariam T. Baker	L I	B.Sc., M. Sc., Ph.D. (Ilorin), MCSN, MSN, RSC	Organic Chemistry and Natural Products
28	A.B. Bello	L II	B.Tech (Ogbomoso) M.Eng.(Minna) MNIAE, R. Engr. (COREN)	Food Process Engineering
29	H.O. Sanusi	L II	B.Eng (Ife), M.Sc (Ibadan); MNIAE, R. Engr.	Industrial Production

			COREN	
30	Ruqayat I. Ajetunmobi-Adeyeye	L II	B.Tech., M.Tech. (Ogbomoso) R. Engr. COREN, MIFT, MAPWEN, MIAENG.	Food Engineering
31	Ikimot A. Adeyemi	AL	B.Eng (Ilorin); M.Sc.(Ibadan); GNSE	Food Engineering
32	L.O. Olatunji	AL	B.Eng (Ilorin); M.Sc.(Ibadan); GNSE	Food Engineering

*Where SL is Senior Lecturer, LI is lecturer I and LII is lecturer II and AL is Assistant lecturer

TECHNICAL STAFF			
S/N	**NAME**	**RANK**	**QUALIFICATION**
1	Rafat. A.O. Sani	Assistant Chief Technologist	B.Sc., M.Sc. (Maiduguri), MNIFST
2.	I. Duniya	Senior Technologist I	B.Sc. (Ibadan), MNIAE, R.Engr. COREN
3.	Olabamibo Adeyinka-Ajiboye	Principal Technologist	HND (Kwara Poly), PGD (Ogbomoso), M.Eng.(Ilorin), MNIAE, R.Engr. COREN (Nig)
4	S. A. Yusuf	Technologist II	B.Eng (Ilorin), GNSE
5.	Zainab K. Abdulraheem	Principal Catering Officer	OND, HND (Kwarapoly), NABTEB
6.	E. O. Dada	Senior Workshop Superintendent	FSLCert, GTC, Trade Test III Trade Test II, Trade Test I
ADMINISTRATIVE STAFF			
1	Kuburat A. Anifowose	Chief Secretariat Assistant	First school-leaving Certificate SSE Certificate Unilorin Staff Development Centre, Computer certificate
2	I. O. Andrew	Executive Officer	SSC (NECO)
3	Veronica B. Ajiboye	Caretaker	SSC (NABTE)

COURSE SYNOPSIS
DEPARTMENT OF FOOD ENGINEERING

FBE 206 **Introduction to Engineering Disciplines**
2 Credits

Introduction to engineering disciplines: Definition of agricultural, biomedical, chemical, computer, civil, electrical, food and bioprocess, mechanical , material, metallurgical engineering and water resources and environmental engineering : Specialization/Options in various departments in engineering: Use of various implements and equipment in engineering for various operations/ processes: Prospects and job opportunities in various disciplines in engineering: Relevant regulatory bodies in engineering**:** The role of engineers in advancement of humanity.

15h (T), 45h (P); C

FBE 222 **Students Work Experience Programme (SWEP)**
6 Credits

Introduction to practices and skills in general engineering through instruction in operation of hand and powered tools for wood and metal cutting and fabrication. Supervised hands – on experience in safe usage of tools and machines for selected tasks.

270h (P); C

FBE 263 **Engineering Mathematics I**
3 Credits

Limits, Continuity, Differentiation, Introduction to linear first order differential equations, partial and total derivatives composite functions, matrices and determinants, Vector algebra, Vector calculus, Directional Derivatives.

45h (T); C

FBE 283 **General Engineering Laboratory Course I**
2 Credits
Laboratory investigation and report submission for selected experiments and projects in Applied Mechanics and Applied Electricity I and Fundamentals of Fluid Mechanics.
90 (P); C

FBE 284 **General Engineering Lab Course II**
2 Credits
Laboratory investigations and report submission for selected experiments and projects in fundamentals of Thermodynamics. Engineering materials, Applied Mechanics II and Applied Electricity III
90h (P); C

FBE 301 **Food Manufacturing Techniques I**
2 Credits
Preliminary and preparative operations including: Cleaning, Sorting, washing, peeling, deskinning, cutting, blanching etc. Ancillary Operations including: Size reduction, sieving and sifting, centrifugation, Floatation, Filtration, mixing, emulsification. Water and waste water treatment, solid waste disposal. Materials handling systems in food processing.
30h (T); C

FBE 302 **Food Manufacturing Techniques II**
2 Credits
Selected food manufacturing procedures such as blanching, pasteurization heat sterilization, evaporation, distillation, extrusion, dehydration, baking, roasting, frying, freezing and packaging at pilot scales – lectures is to be supplemented by visits to food factories.
30h (T); C

FBE 303 **Food Engineering I**

2 Credits

Basic principles of food process engineering – Conservation of mass and energy. Units and dimensions. Conversion factors, Dimensional consistency and analysis. Material balances. batch and continuous processes. General mass balance equations, algebraic unknowns, basics for calculation. Thermodynamic properties of food materials. Sensible and latent heat, Enthalpy. Energy balances. Fluid mechanics . Viscosity. Laminar and turbulent flow. Fluid flow in pipes, pressure drop, friction. Reynolds number, Bernoulli equation.

30h (T); C

FBE 304 **Food Engineering II**

2 Credits

Engineering properties of Food and biological materials. Study of various physical,mechanical, thrermal and other properties of food& biological materials. Importance of such property values on the design & operation of various food and bioprocess engineering systems. The strength of food materials: tensile, compressive and shear stress measurements of foods and biomaterials . The use of Young modulus, the shear modulus and poisson's ratio in the evaluation of food strength .Food emulsions-Basic emulsion types. Fundamentals of rheology and rheological evaluations of foods and biomaterials, structure/ function relationships. Newtonian and Non Newtonian fluids, viscosity , Viscoelasticity , Physico-Chemical properties of food materials : Density, specific heat , thermal conductivity.

30h (T); C

FBE 305 **Heat and Mass transfer**

2 Credits

General principles and mode of heat transfer: conduction, convection and radiation as applied to food processing and engineering. Types of heat exchangers. Steady state and Unsteady state heat transfer; Microwave Heating. Introduction to mass transfer; The diffusion process; Membrane Separation Systems; Mass Transfer in Packaging Materials and Permeability Material to Fixed Gases.

FBE 308 **Biorefining Engineering**

2 Credits

Energy and products for renewable resourses; Concepts, processes, status and future direction of Bioresources Engineering (Fuels, Chemicals and materials for biomass) with emphasis on chemical, biological and Engineering aspect of biorefinery

30h (T), 45h (P);C

FBE 311 **Food Chemistry**

2 Credits

Naturally occurring constituents of foods. Their structure, chemical and physical properties and significance. Food additives Rancidity of fats and oils. Food pigments. Enzymatic and non-enzymatic browning. Chemical, physical and biochemical changes that occur in food during handling, processing and storage. Toxic constituents of foods and their mode of degradation in the body. The use of enzymes in food industry.

30h (T), 45h (P);C

FBE 312 **Food Microbiology**

3 Credits

Microbiology of foods and their raw materials, fermented foods,food sanitation; sanitary aspects of food-borne diseases, water microbiology. Control of pathogens in foods. Insects and rodents in food and their control. Water disinfection and requirements for water in the food industry. Most Portable Number(MPN) and its use in microbial analysis. Microbial toxin: Malting and brewing of alcoholic beverages.

30h (T), 45h (P); C

FBE 313 General Microbiology

2 Credits

Microorganisms and their functions in food spoilage, preservation and processing. Classification of bacteria, fungi and yeast important in foods. Relation between structures and functions of prokaryotic and eukaryotic protists, Microbial growth. Microbial metabolism. Mechanism of pathogenicity. Factors that influence microbial activities (moisture, oxidation-reduction potential,temperature). Effects of microorganisms on processing equipment .Alcoholic beverages production and aromatic products. Laboratory methods of assessing microbiological status of different classes of food commodities: beverages, cereals, roots and tubers, fruits and vegetables,meat, fish and dairy products.

30 h (T); C

FBE 314 Human Nutrition

3 Credits

Situation of nutrition in Nigeria. Protein-calorie malnutrition, Biochemistry of human nutrition in context of physiological systems. Metabolism of carbohydrates, proteins, lipids, metabolism. Important mineral and vitamin deficiencies, their etiology and control. Antinutritional factors in food. Food balance sheets, food composition tables and recommended

dietary allowance. Food and nutrition problems. Policy and programme on food as they relate to developing countries.
30h (T), 45h (P); C

FBE 383 **Food Engineering Laboratory Course I**
1 Credit
Laboratory investigations and reports for selected experiments and projects in strength of materials, thermodynamics and heat transfer.
45h (P); C

FBE 384 **Food Engineering Laboratory II**
1 Credit
Laboratory investigations and reports for selected experiments and projects in food microbiology, food processing techniques and manufacturing, food preservation, food chemistry, mechanics of machines, metallurgy, handling process and storage.
45h (P); C

FBE 392 **Students' Industrial Work Experience Scheme I (SIWES) I**
6 Credits
On the job experience in industry chosen for its relevant in the Student's major. (3 months during the long vacation following 300 level).
270h (P); C

FBE 405 **Food Biotechnology**
3 Credits
Definition and role of biotechnology. Biotechnology and food production. General characterization of bioprocesses (microorganisms, products). Bioreactors/fermentors and living cell as bioreactor. Kinetics of cell growth and product formation. Bioprocess regulation and control. Ethanol and

alcoholic beverages production. Microbial production of enzymes and their applications in food industry.
15h (T), 90h (P); C

FBE 407 **Principles of Food Analysis I**
3 Credits
Theoretical consideration of proximate analysis. Detailed analysis of moisture,carbohydrates,lipids,proteins and amino acids,vitamins,crude fiber and ash in foods. Paper chromatography, thin layer chromatography. Elementary ideas of spectrophotometry.
15h (T), 90h (P); C

FBE 409 **Cereals and Tubers Technology**
2 Credits
This course covers the botanical characteristics, composition, and properties of major cereals and tubers, including maize, rice, sorghum, wheat, cassava, yams, and cocoyams. It explores milling techniques, processing technologies, and the production of composite flours and flour-based products such as pasta and baked goods. The course also introduces post-harvest physiology and storage, focusing on physiological changes that occur in cereals and tubers after harvest, such as respiration, moisture loss, sprouting, enzymatic browning, and microbial deterioration. Storage methods, including traditional, controlled atmosphere, and modern storage systems, will be discussed, along with strategies for minimizing post-harvest losses and maintaining product quality.
15h(T), 45h(P); C

FBE 411 **Fermentation Technology**
3 Credits
The range and type of fermentation processes. Microorganisms involved in fermentation. Biochemical basis of fermentation. Nature and types of

fermentation substrates. Microbial growth kinetics and its application to fermentation types. Culture improvement for industrial processes. Fermentor types and design. Instrumentation and control product recovery and purification. Fermentation economics, selected examples of industrial fermentations.
15h(T), 45h(P); C

FBE 413 **Design of Food Machinery**
3 Credits
Design of various components of food machines. Design features and functions of equipment used in food industry e.g equipment for cleaning, sorting, grading, size reduction, mixing, homogenization, filtration, distillation, centrifugation etc. electric motors.
30h(T), 45h(P); C

FBE 481 **Food Engineering Laboratory III**
2 Credits
Laboratory investigations and reports for selected experiments and projects in food engineering, design of food machinery, agricultural structures and environmental control, and in the approved elective course.
90h (P); C

FBE 492 (SIWES) **Students' Industrial Work Experience Scheme II**
12 Credits
On the job experience in industry at a higher level of responsibility than FBE 392. (During the Second Semester of 400 Level).
540h (P); C

FBE 501 **Food Standards and Quality Control**
3 Credits

The importance of food standards and legislation. Coded Alimentarius. The food standards and legislation of Nigeria. Principles and methods of food quality control. Effect of raw material quality and the various types of processes of yield and quality of the products.
30h (T), 45h (P); C

FBE 502 **Food Process Design**
3 Credits
Definition and objectives of food process design. The roles of process engineer safety and hazard consideration in food process design. Contrast food process design from chemical process design. Block diagrams, process and engineering flow diagrams. Flow sheet construction. Process assessment review, selection and preparation of detailed flow sheets. Flow sheet symbols. Materials and energy balances. Unit processes and operations. Process Calculations. Instrumentation and feedback control systems in process design. Process optimization and quality specifications. Sizing and selection of process equipment.
15h (T), 45h (P); C

FBE 503 **Food Process Plant Design and Economics**
2 Credits
Plant layout in the food industry. Economics of process design .Feasibility Analysis and optimization techniques. Optimum design of food processing plant to include well defined spaces for the following: raw materials storage,spaces for processingequipment, semi and finished products, source of water supply, by-products and waste water disposal, sanitation consideration of the plant, parking spaces for vehicles, etc .Industrial visitation to food industries to help draw attention to certain aspects of food plant location,

layout design and sanitation. A group plant design project will be given to students.
15h (T), 45h (P); C

FBE 505 **Milk and Dairy Technology**
3 Credits
Technology of milk and milk products, condensed and dehydrated filled milk, ice cream, cheese, cultured milk, butter. Machine milking. Milk processing. Dairy waste management and processing. Dairy plant sanitation.
30h (T), 45h (P); C

FBE 506 **Meat and Meat Products Technology**
3 Credits
Processing meat, fish, sea foods, poultry, eggs. Ageing, tenderizing, curing of meat. Manufacture of sausages and other table meats. Smoking, freezing, canning, irradiation of meat, fish, poultry. Intermediate moisture meats, eg pasteurization, freezing, dehydration.
30h(T), 45h(P); C

FBE 511 **Biochemical Engineering II**
3 Credits
Design and analysis of biological reactor. Instrumentation and control of bioreactors. Microbial culture processesin manufacturing processes. Product recovery operations. Bioprocess economics. Microbial populations. Reaction with multiple cell populations.
30h(T), 45h(P); E

FBE 523 **Process Control and Automation**
3 Credits

Introduction to process control and instrumentation – measuring instruments including oscilloscopes, graphics, thermocouples, sensors, accelerometers, AC and DC motors. Process requirements in the food industry. Methods of control – block diagrams, open and feedback systems, stability problems; Laplace transform, transfer function and application. Types of controllers and control actions; frequency – response analysis of elements; transient and steady state solutions; prediction of transient response, optimum control setting methods, control of processes with time delay; electrical devices and applications in food processing. Forms of signals; damping factor and critical conditions, control values and transmission lines; process dynamics e.g. control of heat exchanger, error detector and transducers, electric alarms, heat detection alarm, time relay, temperature relay, remote control, etc – applications of these control devices in food processing operations.
45h (T); C

FBE 522 **Engineering Measurement Systems**
3 Credits
Principles of instrumentation systems, including sensing, signal conditioning, computerized data acquisition, test design, data analysis and synthesis. Includes laboratory.
45 h (T); C

FBE 524 **Processing of Miscellaneous Food Commodities**
3 Credits
Botanical characteristics, composition, properties and processing of non-alcoholic beverages from cocoa, tea, coffee, kola, herbs and spices, sugar confectionery and soft drinks. Selected legumes and their products. Recent advances in the manufacture of non-alcoholic beverages in Nigeria. Nutritional value of non-alcoholic beverages. Classification of Nigeria's

food and agro-industrial raw materials. Constraints to local raw material utilization. Local sourcing of raw materials; problems and prospects, processing characteristics and requirements; quality evaluation and specifications for household/industry use. Methods of processing on chemical composition and storage stability; nutritive value of Nigeria's food raw materials. Entrepreneurship in the raw material development area; resource utilization; upgrading of traditional harvesting and processing methods; conservation practices; conventional and unconventional raw materials. Role of government in promoting local raw materials.
30h (T), 45h(P); C

FBE 541 **Food Packaging Engineering**
3 Credits
Cross-disciplinary study of the materials, machinery, research, design, techniques, environmental considerations, ethics and economics used in the global packaging industry with emphasis on the implementation of improved technologies for the problems unique to food packaging. An emphasis on the broad, systems-based nature of packaging will be maintained throughout the course.
45 h (T); C

FBE 555 **Biological Nano-engineering**
3 Credits
Nano-device design through organization of functional biological components; bio-molecular function and bio-conjugation techniques in nanotechnology; modulation of biological systems using nanotechnology; issues related to applying biological nanotechnology in food energy, health, and the environment.
30 h (T); 45h (P), E

FBE 581 **Food Engineering Laboratory Course IV**
2 Credits
Laboratory investigations and reports for selected experiments and projects in Electrification, Agricultural Mechanization and in three courses in the student's option.
90h (P); C

FBE 582 **Food Engineering Laboratory Course V**
2 Credits
Laboratory investigations and reports for selected experiments and projects in soil and water conservation. Agricultural Land Clearing and Development, and in three courses in the student's option.
90h (P); C

FBE 593 **Food Engineering Research project I**
4 Credits
Original individual student project related to a prescribed food or agricultural engineering problem involving literature review, identification, definition and formulation of the problem, theoretical investigations, modeling, simulation, analysis and design.
15h (T), 135h (P); C

FBE 594 **Food Engineering Research project II**
4 Credits
Second phase of project investigations involving the fabrication of the designed model, debugging, calibration, testing data collection and analysis and presentation of a comprehensive written report of the investigation.
15h (T), 135h(P);C

SUMMARY

100 LEVEL

COMPULSORY COURSES: NIL

Required Courses

GNS 111 (2), GNS 112 (2), GNS 114 (1)
= 5 Credits

Elective Courses:

STA 131 (2), STA 124 (2)
= **4 Credits**

At least 9 credits must be passed out of the following:

MAT 111(3), MAT 113 (3), MAT 112 (3), MAT 114 (3)
= **9 Credits**

At least 9 credits must be passed out of the following:

PHY 115 (2), PHY 125 (3), PHY 142 (2), PHY 152 (3), PHY 191 (1), PHY 192 (1) = **9 Credits**

At least 6 credits must be passed out of the following:

CHM 101 (3), CHM 112 (2), CHM 115 (2), CHM 116 (1), CHM 132 (2) = **6 Credits**

Total = 33 Credits

200 LEVEL

Compulsory Courses:

FBE 283 (2), FBE 284 (2), FBE 222 (6)
= 10 Credits

Required Courses:

ABE 206 (2), ABE 263 (3), ELE 201 (3), ELE 202 (3), MEE 217 (2), MEE 218 (2), MEE 235 (2), CHE 241 (3), CHE 242 (3), CVE 253 (3), CVE 254 (3), CHE 264 (3), ELE 275 (1), ELE 276 (2), MME 272 (2),GNS 211 (2), GNS 212 (2), GSE 202 (2),
= 43 Credits

Total = 53 Credits

DE: GNS 111 (2), GNS 112 (2), GNS 114 (2)
= 4 Credits

300 LEVEL

Compulsory Courses:

FBE 301 (2), FBE 303 (2), FBE 305 (3), FBE 311 (3), FBE 313 (2), FBE 383 (1), FBE 302 (2), FBE 304 (2), FBE 308 (2), FBE 312(3), FBE 314 (2), FBE 384 (1), FBE 392 (6)

Required Courses:

GNS 311 (2), AGY 301 (2), ANP 307 (2), MEE 361 (3), MEE 362 (3), ABE 306 (3), ABE 376 (1), GSE 301 (2)
= **18 Credits**

Total = 43 Credits

DE: GNS 111 (2), GNS 112 (2), GNS 211 (2), 212 (2) GSE 202 (2), GNS 114 (2) **= 12 Credits**

400 LEVEL

Compulsory Courses:

FBE 405 (3), FBE 407 (3), FBE 409 (2) FBE 413 (3), FBE 407 (3), FBE 481 (2), FBE 492 (12)

Required Courses:

ABE 463(2)

= 2 Credits

Elective Courses:

At least 3 credits must be passed out of the following:

MEE 421 (3), ABE 537 (3)

= 3 Credits

Total = 33 Credits

500 LEVEL

Common Courses

Compulsory Courses:

FBE 501(3), FBE 502 (3), FBE 503 (2), FBE 505 (3), FBE 506 (3), FBE 581 (1), FBE 582 (1), FBE 593 (4), FBE 594 (4)

= 24 Credits

Required Courses:

BUL 506 (3), ABE 501 (3), ABE 573 (1)

= 7 Credits

Elective Courses:

At least 3 credits must be passed out of the following:

FBE 555 (3), FBE 511 (3), ABE 534 (3) **= 3 Credits**

Graduation Requirements

1. Major Engineering Courses (ABE, CHE, CVE, ELE, FBE, MEE) = **134 Credits**
2. *Students' Industrial Works Experience Scheme (SIWES I and II) = **18 Credits**
3. Students Work Experience Programme (SWEP) = **6 Credits**
4. General Studies Courses: (GNS 111, 112, 114, 211, 212, 311) = **11 Credits**
5. Minimum Electives **6 Credits**
6. Management, Law, Economics and Entrepreneural Skill courses (GSE 202 (2) GSE 301 (2), BUL 506 (3)) **7 Credits**
7. Agriculture Courses (AGY 301 (2), ANP 307 (2)) **4 Credits**

Total = 167 Credits

***Not used for CGPA computation, but must be passed**

UTME: 167 Credits

DE (200L): 167 Credits

DE (300L): 123 Credits

Computation of Grade Point

1. 100 level courses are not used for computation of CGPA except GNS 111 (2), GNS 111 (2), GNS 114 (1)
2. The 18 credits of SIWES must be passed but they are not used for computation of CGPA
3. The minimum Credits that will be used to compute the CGPA for all options are as follows:
   For UTME, DE at 200 and 300 levels

Level	**UTME**	**DE (200L)**	**DE (300L)**
100 Level	5	-	-
200 Level	52	57	-
300 Level	43	43	56
400 Level	21	21	21
500 Level	46	46	46
Total	**167 Credits**	**167 Credits**	**123 Credits**