NIGER DELATA UNIVERSITY,

WILBERFORCE ISLAND, BAYELSA STATE.

DEPARTMENT OF MECHANICAL ENGINEERING

FACULTY OF ENGINEERING,

HANDBOOK

FOR

B.ENG DEGREE PROGRAMME

2023 – 2024

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The Vision of Mechanical Engineering Programme

The vision of the Department of Mechanical Engineering is to be a department with the prowess to produce students that will make the university proud in creativeness, innovativeness, and full of techno-industrial inspiration.

The Mission of Mechanical Engineering Programme

The mission of the Department of Mechanical Engineering is to apply the international best practices in our staff to educate our students the most current digital and scientific modern technology in such a way that they are both theoretically and practically sound. Also, it is the priority of the department to shape our students to compete with their counterparts in any university globally.

FORWARD

The Department of Mechanical Engineering was established at the founding of the University in 2000 to run a five-year Bachelor of Engineering (B.Eng.) Degree programme in Mechanical Engineering. Student admission started with the 2001/2002 Academic Session. By 2003/2004 academic year, Marine Engineering programme was added to the Faculty Engineering with Marine and Mechanical Engineering programmes in the Department of Mechanical/Marine Engineering. The Mechanical Engineering programme started with academic staff strength of eight (8) and a student population of nineteen (19). By the 2019/2020, 2020/2021 and 2021/2022 academic years the academic staff strength increased to twenty (20) while the student population in Mechanical Engineering programme has increased to two hundred and eighty one (281), two hundred and seventy three (273) and two hundred (200) with a corresponding staff – student ratio of 1:14, 1:14 and 1:10 respectively. The technical staff strength is ten (10) in addition to support staff from the works department. Presently, the teaching staff of the department is made up of four (4) Professors, seven (7) Senior Lecturers, six (6) Lecturer I and three (3) Lecturer II. The Mechanical Engineering programme has had number of both National Universities Commission (NUC) and the Council for the Regulation of Engineering in Nigeria (COREN) accreditation visitations. The Mechanical Engineering programme was granted full accreditation by NUC and COREN following their visitation in the 2018/2019 Academic Session.

The Department of Mechanical Engineering supports postgraduate programmes leading to Master of Engineering (M.Eng) in Mechanical Engineering and Doctor of Philosophy (PhD) in Mechanical Engineering with options in Design and Production Technology, Energy and Power Technology, Materials Technology, Industrial and Systems Engineering and Applied Mechanics. Thus, the postgraduate programmes have graduated seven (7) PhD and twenty-one (21) M.Eng students respectively. With the improvement in the quality of academics staffing, infrastructure and departmental laboratories/workshops, and equipment, the Department is better positioned to train Mechanical Engineers to cope with nation's needs.

Engr. Dr. Tolumoye John Ajoko

Ag. HOD

November, 2023

The Philosophy and Objectives of Mechanical Engineering Programme

Philosophy

The Department of Mechanical Engineering, Niger Delta University, shall be a centre of excellence in producing well-trained mechanical engineering graduates and in conducting applied research and development in Nigeria and the world at large, by attracting and retaining high quality staff that will give the best of knowledge to students. Hence, the general philosophy of the programme is to produce graduates having high academic standard and adequate practical background valuable to industries and for nation building in general. Courses are therefore, offered to impart sound knowledge to students on the art of application of related principles.

Objectives

The general objective of Mechanical Engineering programme training in the Niger Delta University is to be in consonance with the realization of the Niger Delta Regional needs and aspiration vis-à-vis industrial development and technological emancipation of the country. The programme is designed to meet these needs and to produce graduates in Engineering with sufficient academic background coupled with adequate practical experience and who are able to rise to the challenges of our developing economy. Such graduates must, therefore, be resourceful, creative and be able to perform the following functions:

- To show ingenuity by being creative
- To design Engineering projects and supervise their construction
- To design and make components machines equipment and systems.
- To design and develop new products and production techniques in industries
- To install and maintain complex engineering systems so that they can perform optimally in our environment.
- To adapt and adopt exogenous technology in order to solve local engineering problems.
- To be conversant with all the materials, components, machines, equipment, production techniques and systems in his area of specialization.
- To maintain the specific production equipment in his area of specialization.
- To plan, manage and responsible for quality control of the products and processes in the plant and/or factory.

Admission Requirements for B.Eng. Degree programme

a. University Requirement

Joint Matriculation Examination (JME) (Year I) SSCE/GCE O'level/NECO with credit passes in 5 appropriate subjects including English Language, Mathematics obtained in not more than two (2) sittings.

b Faculty/Department Requirements

(i) Admission could be granted either through University Matriculation Examination (UME) or Direct Entry. The admission requirements for entry into year one of the University are the University Matriculation Examination (UME) and a minimum of five (5) Credits, including English Language, Chemistry, Physics and Mathematics or Further Mathematics, in the SSCE/NECO/GCE 'O' level. In a bid to reduce malpractices to a minimum, the University also conducts Internal Screening to admit candidates.

(ii) The Direct Entry Requirements are at least three (3) 'A' level passes at GCE or its equivalent including Physics, Chemistry and Mathematic or Further Mathematics. Candidate must also have at least two (2) credits level passes at SSCE/NECO/GCE 'O' level including English Language and Further Mathematics. Candidates who satisfy the direct entry requirements may be given admission into the second year.

General Guideline

Students are expected to take and pass the NUC required ten (10) units of Mathematics, ten (10) units of Physics and ten (10) units of Chemistry at the first year (100 level). Any deficiency on this requirement must be remedied before the student would be allowed to register for Courses in the third year (300 level). The student deficiency will, may be advised to withdraw from the Faculty of Engineering.

Duration of Programme

The B.Eng. programme in Mechanical Engineering runs for five years (10 semesters) comprising of classroom studies, workshop/ laboratory, fieldwork and supervised industrial work experience (SIWE) attachment as follows:

- Year I, II and III Classroom, Workshop/laboratory Work
- Year II long vacation 3 months SIWES to be done within the University

- Year III long vacation 3 months SIWES to be done either within or outside the University as may be indicated by the student's Head of Department.
- First Semester of Year IV Classroom, Workshop/ laboratory.
- Second Semester and long vacation of Year IV 6 months SIWES to be done in any Firm/Industry/ Establishment anywhere.
- Year V Classroom, Workshop/laboratory Work and Final year Project.

Format for Course Numbering

Faculty Courses

The Faculty courses are numbered according to the Senate Curriculum and Instruction Committee recommendation on Course numeration. The course number starts with FCE followed by a three digits number:

The first letter (F) represents **Faculty**

The second letter (C) represents **Course and**

The third letter (E) represents **Engineering**

The first digit indicates the Course level where

1 - 100 level

2 - 200 level

3 - 300 level

4 - 400 level

5 - 500 level

The second digit indicates the Department where the Course is domiciled or run:

0 Faculty of Engineering General Course

1 Agric & Environmental Engineering

2 Chemical Engineering

3 Civil Engineering

4 Electrical/ Electronic Engineering

5 Marine Engineering

6 Mechanical Engineering

7. Petroleum Engineering

The third digit indicates the semester in which the course is offered;

odd numbers - first semester, and

even numbers - second semester.

Course Domiciliation:

In the **Department of Agricultural and Environmental Engineering**

FCE 212 - Strength of Materials 1

FCE 411 - Engineering Practice & Research Presentation

In the **Department of Chemical Engineering**

FCE 221- Material Science

In the **Department of Civil Engineering**

FCE 131 Engineering Graphics I

FCE 132 Engineering Graphics II

FCE 232 Fundamentals of Fluid Mechanics

FCE 532 Entrepreneurship

In the **Department of Electrical/Electronics Engineering**

FCE 244 - Fundamentals of Electrical Engineering

In the **Department of Mechanical Engineering**

FCE 261 - Engineering Graphic III

FCE 263 - Workshop/Manufacturing Technology

FCE 265 - Engineering Statics

FCE 267 - Engineering Thermodynamics

FCE 262 - Engineering Dynamics

In the **Department of Petroleum Engineering**

FCE 571 - Engineering Economics and Management

In the **Faculty** General Faculty Courses

FCE 201- Engineering Analysis I

FCE 202 Engineering Analysis II

FCE 302 Engineering Analysis IV

FCE 200 SIWES I

FCE 300 SIWES II

FCE 402 SIWES III

Departmental Programmes

Course Coding

A uniform alphabets format has been adapted to code courses in the Departments of the Engineering programme; the first and second alphabets stand for the Department. The last alphabet stands for Engineering Thus:

- Agric. & Environmental Engineering AEE
- Chemical Engineering CHE
- Civil Engineering CVE
- Electrical/ Electronic Engineering EEE
- Marine Engineering MAE
- Mechanical Engineering MEE
- Petroleum Engineering PEE

The numbering system in the course codes is similar to that of the Faculty course numbering; the first digit indicates the year in which the particular course is offered and the last digit indicates the semester

- odd numbers for first semester and
- even numbers for second semester.
- the center digit represents the course group in the Department.

MECHANICAL ENGINEERING PROGRAMME

Mechanical Engineering applies basic scientific principles to the design, manufacture, operation and maintenance of all forms of mechanical devices, as well as management of human and material resources necessary for these activities. Courses are therefore, offered to impart sound knowledge to students on the art of application of the related principles.

The first four years of the 5-year programme are devoted to advanced studies in the basic science and fundamental engineering concepts. Design a central activity in Mechanical Engineering,

features prominently in these years, so also are the necessary tools of mathematics, numerical methods and computing. Furthermore, an equivalent of one year industrial work experience is provided within the period to develop professionalism and adaptability towards industrial life.

In the fifth year, more advanced courses are offered in Applied Mechanics, Thermofluids and Control Engineering. This concludes with an in-depth study of Mechanical Engineering in a form of a final year project is undertaken by each student.

Group of Departmental Courses

The departmental course numbers start with MEE indicating Mechanical Engineering course, followed by three digits which have the following connotations: The first digit indicates year the course is offered. The second digit indicates the course group, and the following groups are employed:

Group 1: Applied Mechanics
Group 2: Thermal Engineering
Group 3: Fluid Mechanics
Group 4: Mechanics of Materials
Group 5: Materials Science
Group 6: Production Engineering
Group 7: Industrial Engineering
Group 8: General Engineering
Group 9: Engineering Design

The third digit indicates the semester in which the course is offered. 1, 3, 5 etc for first semester and 2, 4, 6 etc for second semester.

GROUP TITLE/COURSE YEARS/SEMESTER

Applied Mechanics and Design

FCE 265	-	Engineering Statics	II-1
FCE 262	-	Engineering Dynamics I	II-2
MEE 311	-	Engineering Dynamics II	III-1
MEE 314	-	Mechanics of Machines	III-2
MEE 511	-	Mechanics of Vibrations	V-1

MEE 513	-	Tribology	V-1
MEE 517	-	Automatic Control	V-2

Thermal Engineering

FCE 267	-	Engineering Thermodynamics	II-1
MEE 322	-	Thermodynamics II	III-2
MEE 421	-	Heat Transfer	IV-1
MEE 423	-	Thermodynamics III	IV-2
MEE 521	-	Thermodynamics IV	V-1
MEE522	-	Refrigeration & Air Conditioning	V-2

Fluid Mechanics

FCE 232	-	Fluid Mechanics I	II-2
MEE 331	-	Fluid Mechanics II	III-1
MEE 431	-	Fluid Power Systems	IV-1
MEE 531	-	Fluid Dynamics	V-1
MEE 532	-	Fluid Machinery	V-2

Mechanics of Materials

FCE 212	-	Strength of Materials I	II-2
MEE 341	-	Strength of Materials II	III-1
MEE 542	-	Theory of Elasticity and Plasticity	V-2

Material Science

FCE 221	-	Materials Science	II-1
MEE351	-	Metallurgy I	III-1
MEE 451	-	Metallurgy II	IV-2

Production Engineering

FCE 251	-	Workshop Technology	II-1
MEE 361	-	Manufacturing Technology I	III-1
MEE 362	-	Manufacturing Technology II	III-2

MEE 561	-	Production Management	V-1
MEE 562	-	Maintenance Management	V-2

Industrial Engineering

MEE 571	-	Engineering Economics & Management	V-1
MEE 471	-	Materials Handling	IV-1
FCE 430	-	Industrial Law and Relations	IV-1

General Engineering

FCE 200	-	S.I.W.E.S (Long Vacation)	II-1
MEE 411	-	Engrg pract & research presentation	IV-1
FCE 301	-	S.I.W.E.S (Long Vacation)	III-1
MEE 382	-	Mechanical Engineering Lab I	III-2
FCE 402	-	S.I.W.E.S	IV-2
MEE 582	-	Automatic Control	V-2
MEE 581	-	Mechanical Engineering Lab II	V-1
MEE 591	-	CAD/CAM	V-1
MEE 583	-	Project	V -1 & 2

Engineering Design

FCE 131	-	Engineering Graphics I	I-1
FCE 162	-	Engineering Graphics II	I-2
FCE 261	-	Engineering Graphic III	II-1
MEE 392	-	Mechanical Engineering Design I	III-2
MEE 491	-	Mechanical Engineering Design II	IV-1
MEE 493	-	Automobile Engineering	V-1

B.ENG MECHANICAL ENGINEERING PROGRAMME

100-LEVEL **FIRST SEMESTER**

S/N	Course Code	Course title	L	T	P	U
1	GST 101	Use of English I	2	2	0	3
2	MTH 105	Engineering Mathematics I	3	4	0	5
3	PHY 105	General Physics I	3	2	3	5
4	CHM 101	General Chemistry I	3	2	3	5
5	FCE 131	Engineering Graphics I	1	0	3	2
6	GST 100	Fundamental of Computer Science	3	0	0	3
		TOTAL	15	10	9	23

100-LEVEL **SECOND SEMESTER**

S/N	Course Code	Course title	L	T	P	U
1	GST 102	Use of English II	2	2	0	3
2	GST 110	Nigerian Peoples and Culture	3	0	0	3
3	FCE 132	Engineering Graphics II	1	0	3	2
4	MTH 106	Engineering Mathematics II	3	4	0	5
5	PHY 106	General Physics II	3	2	3	5
6	CHM 102	General Chemistry II	3	2	3	5
		TOTAL	15	10	9	23

200-LEVEL **FIRDT SEMESTER**

S/N	Course Code	Course title	L	T	P	U
1	FCE 201	Engineering Analysis I	2	2	0	3
2	FCE 261	Engineering Graphics III	1	0	3	2
3	FCE 263	Workshop/Manufacturing Technology	1	0	3	2
4	FCE 265	Engineering Statics	2	2	0	3
5	FCE 221	Material Science	2	0	3	3
6	FCE 267	Engineering Thermodynamics	2	2	0	3
7	GST 221	Peace and Conflict Resolution Studies	2	0	0	2
		TOTAL	12	6	9	18

200-LEVEL **SECOND SEMESTER**

S/N	Course Code	Course title	L	T	P	U
1	FCE 202	Engineering Analysis II	2	2	0	3
2	FCE 246	Computer Engineering II	2	0	3	3
3	FCE 232	Fundamentals of Fluid Mechanics	2	2	0	3
4	FCE 212	Strength of Materials I	2	2	3	4
5	FCE 244	Fundamentals of Electrical Engineering	1	2	3	3
6	FCE 262	Engineering Dynamics I	2	2	0	3
7	GST 212	Introduction to Philosophy and Logic	3	0	0	3

		TOTAL	14	10	9	22

S/N	Course Code	Course title				U
1	FCE 200	SIWES (During Long Vacation)				0

300-LEVEL: **FIRST SEMESTER**

S/N	Course code	Course title	L	T	P	U
1	FCE 301	Engineering analysis III	2	2	0	3
2	MEE 311	Engineering dynamics II	2	2	0	3
3	MEE331	Fluids mechanics II	2	0	3	3
4	MEE 341	Strength of materials II	2	0	3	3
5	MEE 351	Metallurgy I	2	2	0	3
6	MEE 361	Manufacturing technology	2	0	3	3
		Total	**12**	**6**	**9**	**18**

300-LEVEL*:* **SECOND SEMESTER**

S/N	Course Code	Course title	L	T	P	U
1	MEE 382	Mechanical Engineering Laboratory I	0	0	6	2
2	FCE302	Engineering analysis IV	2	2	0	3
3	EEE 362	Electrical machines and drives	2	0	0	3
4	MEE 314	Mechanics of machine	3	0	3	4
5	MEE 392	Mechanical engr. Design I	2	2	0	3
6	MEE 322	Thermodynamics II	2	2	0	3
7	MEE 362	Manufacturing technology II	2	0	3	3
8	GST 300	Entrepreneurship development and industry	2	0	0	2
		Total	**15**	**6**	**12**	**23**

400-LEVEL*:* **FIRST SEMESTER**

S/N	Course Code	Course title	L	T	P	U
1	MEE 491	Mechanical Engr. Design II	2	0	3	3
2	MEE 421	Heat transfer	2	0	3	3
3	MEE 431	Fluid power systems	2	2	0	3
4	MEE 451	Metallurgy II	2	2	0	3
5	MEE 493	Automobile engineering	2	0	3	3
6	MEE 401	Instrumentation and measurement	2	0	3	3
7	MEE 423	Thermodynamics III	2	2	0	2
8	MEE 411	Engineering practice and research presentation	1	2	0	2
9	*MEE 471	Materials Handling	2	0	0	2
		Total	**15**	**8**	**12**	**22**

*: Elective Course

400-LEVEL: **SECOND SEMESTER**

S/N	Course Code	Course title				U
1	FCE 402	SIWES				9

500-LEVEL: **FIRST SEMESTER**

S/N	Course Code	Course title	L	T	P	U
1	MEE 581	Mechanical Engineering Laboratory II	0	0	6	2
2	MEE511	Mechanical vibration	2	2	0	3
3	MEE513	Tribology	2	2	0	3
4	MEE523	Thermodynamics IV	2	0	3	3
5	MEE531	Fluid dynamics	2	2	0	3
6	FCE571	Engineering Economics and Management	2	0	0	2
7	MEE561	Production management	2	0	0	2
8	MEE 591	Computer –aided Design & Manufacturing (CAD/CAM)	2	2	0	3
9	MEE583	Project	0	0	6	0
		Total	**14**	**4**	**15**	**21**

500-LEVEL: **SECOND SEMESTER**

S/N	Course Code	Course title	L	T	P	U
1	MEE512	Automatic control	2	2	0	3
2	MEE522	Refrigeration and air conditioning	2	0	3	3
3	MEE532	Fluid machinery	2	0	3	3
4	MEE542	Theory of elasticity and plasticity	2	2	0	3
5	FCE 532	Industrial law and relations	2	0	0	2
6	MEE562	Maintenance management	2	0	0	2
7	MEE583	Project	0	0	6	6
		Total	**12**	**4**	**12**	**22**

DESCRIPTION OF COURSE

GST 101:- Use of English I 3 Units

An overview of the concept of language, importance of the English language in Nigeria. The sentence, the phrase/clause, parts of speech, rule of concord, direct & indirect speech. The paragraph, punctuation, figure of speech and oral communication.

GST 100 Fundamentals of Computer Science 3 Units

Introduction to Computers, Computer and uses; Computer Logic soft wares and hard wares. Basics of computer language FORTRAN, BASIC, COBOL, etc. Basic Computer appreciation MS word, MS DOS, etc. Flow Charting and computer algorithm design. Extensive exercises in

solution .to engineering problems using computer algorithms, flow charts and/or other pseudo codes. Introduction to advanced programming languages. Application of Computer BASICS, FORTRAN. Flow Charting/Pseudo Codes to simple engineering problems. Basic computer appreciation and overview in MS Word, Excel, CorelDraw.

GST 102:- Use of English II, 3units
Vocabulary, roots and affixes, idioms. Figure of speech (part ii), summary. Essay writing, letter writing.

GST 110:- Nigerian Peoples & Culture, 3 Units
Introduction to man and society, history of Nigerian society and people. Structural components of Nigerian people and culture. Cultural similarities and variations of the Nigerian people. Nature and culture of traditional religion, rites of passage, systems of marriage, decent, kinship and family, Nigerian heritage. The evolution of Nigeria, politics and democracy.

FCE 131:- Engineering Graphics 1, 2 Units
Use of draughting instruments, lettering dimensioning, layouts. Constructions of geometrical figures, comics, etc. Graphical calculus and applications. Development, intersection of curves and solids, tangents etc. projections – Orthographic and Isometrics, sectional views.

FCE 132:- Engineering Graphics II, 2 Units
Pictorial/Freehand sketching, conventional practices. Architectural drawing. Advance topics in auxiliary and sectional views, developments, intersection of surfaces, projections.

MTH 105:- Basic Functions and Series, 5 Units
Sets, mapping, functions inequality, graphs, quadratic equations, remainder theorem, surds and indices, AP, GP, logarithmic and exponential functions. Permutations and combinations and binomial theorem. Trigonometry, complex numbers, analytical geometry. Review of calculus, derivatives and differentials, L'hopital rule, methods of integration, definite integrals. Infinite series. Taylors and Maclaurin's series. Equation of lines, circles etc.

MTH 106:- Linear Algebra and ODEs, 5 Units

Scalars and vector algebra, vector calculus, differentiation and integration. The gradient of a scalar field, the divergence and curl of a vector field, application to co-ordinate system. Eigen values and vectors. More matrixes. Differential equations. First and second order diferential equation and their applications. Linear programming.

PHY 105: Physics I 5 Units

Physical quantities; units, vectors, particle. Kinematics and dynamics. Oscillations. Work. Energy, Momentum. Angular momentum. Motion of rigid bodies. Collisions Hooke's Law. Sound waves. Calorimetric. Gas Laws and Kinetic Theory. Heat and work. Laws of Thermodynamics and applications. Surface tensions.

PHY 106: Physics II 5 Units

Electrostatics. Electric intensity. Coulomb's and Gauss laws. Capacitors. D.C. Current circuits. Electrolytic cells. Magnetic fields of currents, Electro-magnetic induction generators. Induction. Electric motors. A.C. circuit theory-theories of magnetism. Optical instruments. Quantum theory. Photoelectric effect. Bohr's atom model of Energy levels and lines spectra. Matter waves. Band spectra. Semiconductors.

CHM 101: General Chemistry I 5 Units

Atomic and molecular structure. Electronic configuration and periodicity. Metals and Non-metals. Chemical Bonding. The Mole concept. Chemical equations and stoichemistry. Acids. Bases and salts. Chemical equilibrium. Lionization of water. Indicators etc. the pH scale, Buffer solutions. Hydrolysis of salts. Redox reactions. Electro-chemical cells and electrode potentials. Electrolysis. Chemical Energetic. Thermodynamics. Chemical Kinetics chemical reaction rates; homogeneous and heterogeneous catalysis.

CHM 102: General Chemistry II: 5 Units

Colligative Properties. Ideal solution. Osmotic Pressure and determination of molecular mass. Raoult's law. Henry's Law. Phase rule and phase diagrams. Emulsions and suspensions. Transport phenomena Diffusion and viscosity. Sources of organic compounds. Aliphatic and

Aromatic hydrocarbons Nomenclature, Homologous series, Isomerism, Functional groups; Alcohols, carbonyls, carboxylic acids, esters and Ethers. Introduction to spectroscopy-basic principles.

FCE 201:- Engineering Analysis 1, 3 Units

General engineering systems, rate systems and their relationships, principles of optimization. Use of functions of several variables, partial derivatives, total differentials in component design and optimization. Taylor's formula and its extension to functions of several variables. La Granges multipliers and their engineering applications. Complex variables. Taylor's and Laurent's expansion etc.

FCE 221:- Material Science, 3 Units

The atomic structure, crystal structure and material bonding, physical properties of materials. Classification of materials, Dislocation theory. Metals – ferrous & non-ferrous. Polymers – thermosetting and thermoplastic materials. Wood – natural and modified. Rubber, ceramics and composite materials.

FCE 261:- Engineering Graphics III, 2 Units

Introduction to limits, fits and tolerance. Surface roughness determinations. Drawing methods for cam profiles. Presentation and drawing of various types of gears. Assembly and sub-assembly drawing of elements. Workshop drawing correction and modification of drawings symbols. Reading of blueprints.

FCE 263:- Workshop/Manufacturing Tech, 2units

Safety and safe working practices in the workshop. Carpentry and journey process. Forging furnance and operations. Fitting and plumbing. Hand drilling and tapping, measuring instruments such as micrometers, venier calipers, height gauges, berel protector, sine bar, gauge blocks. Checking surface for flatness, squareness etc. types of patterns and pattern making molding sand and molding process. Ferrous and non-ferrous casting. Casting methods. Introduction to lathe, milling, shaping and drilling machines, cutting fluids and applications.

FCE 265:- Engineering Statics, 3 Units

Basic concepts: Newton's law of motion, mathematical modeling analysis. Statics: force systems, resultant of coplanar and spatial force systems, equilibrium conditions. Shear forces and bending moments in beans shaft, analysis of trusses and frames friction between dry surfaces. Moments of martial, plane figures and composite bodies.

FCE 267:- Engineering Thermodynamic, 3 Units

Fundamental concepts: systems, properties and processes, that and work. First law-closed system, open system and model applications. Working fluid – liquid, vapors and perfect gases. Steam tables. Second law, cycle efficiency. Reversibility. Entropy. Simple cycles, Carnot, Rankin, air standards.

GST 221:- Peace and Conflict Resolution, 3 Unit

Basic concepts of peace and conflicts, types, sources and causes of conflict and violence. Conflict mgt strategies. Traditional approaches alternative dispute resolution and third winds in judiciary. Case studies and group discussions, comparative study of ethnic militia and youth insurgency in Nigeria. Models of conflict resolution and peace building. Peace keeping efforts.

FCE 202:- Engineering Analysis II, 3 Units

Concepts of uncertainties and engineering production. Basis systems engineering minimization, maximization principle, simplex and queuing principles. Engineering experimentations, field surveys, predictions and report. Probability models. Statical quality control.

FCE 212:- Strength of Materials, 3 Units

Force equilibrium, free body and force diagrams, concept of stress and strain. Tensile test; Biaxial and triaxial states of stress and strain. Axially loaded bars, composite bars, temperature stresses. Hoop stress in cylinders and rings. Bending moment, shear force and diagrams. Torsion and application. Stress transformations. Failure theories, and the Mohr's Circle. Strain energy and applications.

232:- Fundamentals of Fluid Mechanics, 3 Units

Fundamental concepts: characteristics of fluids, fluid properties, dimension and units. Nature of fluid flow. Newtonain and Non-Newtonain fluids. Fluid statics: pressure, buoyancy, force on submerged body, stability of bodies in fluids. Fundamentals of fluid motion. Conservation laws of mass, momentum and energy. Euler's equation, Bernoullis equation and applications. Flow measurement pressure, velocity, rate measurement techniques.

FCE 244:- Fundamentals of Electrical Engineering, 3 Units

The electric circuit. DC and AC analysis techniques. Measurement of basis electrical quantities, Electrical machine. Alternating voltage and electric devices. Installation techniques.

FCE 262:- Engineering Dynamics, 3 Units

Plane kinematics and kinetics of particles. Newton's second law. Work and energy, conservation of energy and momentum, fields of forces. Impact of coefficient of restitution. Kinetics of systems of particles. Generalized Newton's second law, steady mass flow and variable mass rocket motion, kinetics of rigid bodies. 3D dynamics of rigid bodies, gyroscopic motion and stabilization.

FCE 301- Engineering Analysis III, 3 units (prerequisite:FCE 202)

Overview of general engineering responses to mathematical applications in problem solving. General second order ODEs, systems of linear ODEs and applications in theory of failure. Partial differential equations, Laplace equation, the wave equation, the heat equation. Base functions and Legendre polynomials. The line integrals, surface integrals. Double and triple integrals, green's, strokes and divergence theorems with applications. Laplacean operator.

MEE 311 Engineering Dynamics II, 3 Units (Prerequiste: FCE 262)

3D kinematics of particles and rigid bodies. Mass and products of inertia. Inertia transformations and the eigen-value problem. 3D kinetics of rigid bodies, Newton second law of motion, energy methods, impulse and momentum method. Eulerian angles and gyroscopic motion. Introduction to vibration analysis the spring-mass system, damped and undamped single degree of freedom free vibrations.

MEE 331 Fluid Mechanics II, 3 Units (Prerequisite: FCE 232)

Dimensional analysis and Similitude: analysis methods, types of similarity. Curved flow, invicid curved flow, vortices. Introduction to turbulence; mixing length theories, effects of roughness. Flow in pipes; friction, empirical relations, effects of pipe shape, bend and fittings, pipe networks. Water hammer, flow in open channels; steady uniform flow, non-uniform flow, gradual and rapid varying flow.

MEE 341 Strength of Materials II, 3 Units (Prerequisite: FCE 214)

Statically indeterminate systems; review of superposition method, moment area method; Castliano's theorem and application. 3-D stress systems; principle stresses, strain energy methods. Theories of failure. Theory of columns; Euler's column formulae, the secant, Rankin-Gordon and empirical formulae. Thick-walled cylinders, stresses in simple and compound cylinders, rating discs. Failure mechanics; creep failure, fatiogue failure, ductile and brittle failure.

MEE 351 Metallurgy I, 3 Units ([Prerequisite: to FCE 221)

Binary, equilibrium-phase rule and phase diagrams. Crystallization process. Crystallography and microstructure. Diffusion in metals. Heat treatment. Hardening Processes and hardenability (end quench) tests. Corrosion and Oxidation, Non-destructive testing and mechanical testing.

MEE 361 Manufacturing Technology I, 3 Units (Prerequisite: FCE 252)

Types of patterns and pattern making, molding sand, molding process; machine molding. Ferrous and non-ferrous castings, various casting methodss and casting defects. Arc and gas welding processes, soldering brazing. Introduction to lathe, milling, shaping and drilling machines. Cutting fluids:- types and applications.

Advanced operations on lathes, milling, shaping and drilling machines. Plaining, slotting and boring machines. Grinding-ssurface, cylindrical and centreless grinding, Capstan, turret, copy turning lathe and broaching. Hot working of metals such as rolling forging etc. cold working of metals such as drawing and squeezing etc. press and process work.

MEE 312 Mechanical Engineering Design I, 4 Units (Prerequisite: MEE 241)

Basic concepts: introduction and review of strength of materials. Theories of failures and factor of safety. Stress concentration. Factors affecting fatigue strength. Component Design: designs of various machine components including shafts, axles, springs, keys, pins and splines, bolts with pre-loading, couplings, clutches and brakes; welded, riveted and threaded joints.

MEE 314 Mechanics of Machines, 3 Units (Prerequisite: MEE 311)

Introduction and classification of mechanisms, definition and terminology. Kinematics inversion and 4R-Bar mechanism. Kinematics of mechanisms, gear and geared systems, cams, analytical and Dynamic analysis, inertia forces and couples. Kinetic energy method, fluctuation of energy and speed. Balancing of rotating and reciprocating masses. Governors types controlling forces and stability.

MEE 322 Thermodynamics II, 3 Units (Prerequisite: FCE 267)

Vapour power cycles: Carnot Rankin with modification. Mixtures of gases, psychiometry, simple air-conditioning systems, cooling tower condensers. Thermodynamic relations and exact definitions. Maxwell relations. Entropy and second law.

MEE 362 Manufacturing Technology II, 3 Units (Prerequisite: FCE 252)

Principles of metal machining, types of chips, Merchant's force analysis, merchantability. Tool life, cutting tool materials, surface finishing operations such as lapping, painting, electro-plating etc. Gears production and testing, screw thread production and measurement, machine tool maintenance and trouble shooting. Installation and testing of machine tools. Jigs and Fixtures Metrology, Comparators, Limit and Fits, Gauge and design.

MEE 382 Mechanical Engineering Laboratory I (2 Credits Units)

Laboratory experiments on Mechanics of Machines, turbo-machinery, Fluid Mechanics, strength of materials, metallurgy, materials production, and manufacturing processes.

FCE 302- Engineering Analysis 1V (3 units)(prerequisite:FCE301)

The recovery techniques, mathematical applications is system discretization processes, the finite difference, interpolation formulae, numerical integration and differentiation their uses in system analysis. Numerical solution of linear and non-linear equations and application to engineering. Finite element methods and application

GST 300- Entrepreneurial Development & Industry (2 units)

Factors of production, supply and demand. Price, household behaviour theories. Business organisation, production, the market. Income. Employment- classical, non-classical and keynessian approaches. Money, expenditure. Taxation, budget, international trade.

MEE 413 Mechanical Engineering Design II, 4 Units (Prerequisite: MEE 312)

Further Component Design: Further design of machine components including bearings (roller, journal and thrust bearings), seals and application. Hydrodynamic lubrication and gears Belt and chain drives. Standards and selection. Design concept: concept of optimum design. Creative process in design, creativity, review of various methods of reseach for best solution. Material selection. Use of hand book sand standards. Assembly drawings. Final technical documentation. Analitical and experimental verification. Feedback in project: student will be required to carry out project involving design of a suitable equipment to fulfill given specification, selection of appropriate layout, detailed and assembly drawings.

MEE 421: Heat Transfer, 3 Units (Prerequisite: MEE 322)

Introduction: modes of heat flow, basic laws and analogies. Conduction: steady one dimensional heat conduction, solution techniques. Convection; free and forced convection in ducts and on surfaces. Radiation; black and grey bodies, Heat exchanges; types and design procedure. Mass transfer; modes of mass transfer and applications.

MEE 423 Thermodynamics III, 2 Units (Prerequisite: FCE 322)

Gas power cycles, Brayton cycle with modifications, air standard cycle. Reciprocating expanders and compressors, indicated and hypothetical diagrams. Refrigerating cycle, Reversed Carnot, vapour compression and absorption cycles.

MEE 431: Fluid Power System, 3 Units (Prerequisite: FCE 232)

introduction; hydraulic and pneumatic machinery, component and symbols. Components design and characteristics ; pumps, hydraulic motors, cylinders. Valves, accumulators etc. standard circuits, displacements, control of speed, pneumatic circuits and fluid logic control systems. Introduction to servo mechanisms.

MEE 451: Fluid Power System, 3 Units (Prerequisite: FCE 351)

Iron production by the blast furnace and direct reduction methods. Steel working by various methods. Ingot technology, continous casting. Stainless and tool steel production. Cast irons. Power metallurgy. Non-ferrous metals; extraction and refining. The metallurgy of cast-metals.

MEE 471: Material Handling 2 UNITS

Classification of transportation system, properties of materials and handling machines. General theories of conveyors; capacity, tension and strenght of pulling members, power of driving units. Belt conveyors: general ideas, design, maintenance, apron, flight, bucket, overhead moving stairways, screw, roller, vibration, hydraulic and pneumatic conveyors. Intermittent operation handling machines. Jack, pulleys, lifts, overhead cranes, cableways, cranes, theory and calculations. Other types of intra-shop cars, trucks, forklifts feeders and discharges.

MEE 491: Automobile Engineering, 3 Units

Introduction to types of automobiles and applications. Automobile theory; forces on vehicles and performance analysis. Types of engines and engines sub-systems. Power transmission; mechanical hydraulic and electrical systems. Motor-car body and under carriage; component and structural details. Vibration problems and stability. Banks; braking forces, drum and disk transmission of braking force. Electrical systems; electricity generation and storage units' and distribution systems.

MEE 483 Instrumentation and Measurement, 4 Units

Fundamentals of Mechanical Measurements; characteristics of dynamic signals, standards of measurement and statistical treatment of data. The generalized measurement system; the basic

detector transducer elements. Intermediate modifying systems, the terminal devices and methods. Applied Mechanical Measurement: The determination of count, events per unit of time and interval. Measurement of dimensions, displacement and linear velocity. Strain measurement and the mteasurement of force and torque. Pressure, flow and temperature measurements. Vibration and shock measurements and test methods and acoustical measurements

MEE 511 Mechanical Vibrations , 3 Unit (Prerequisite: MEE311)

The phenomenon of vibration. 'Free and forced vibration of single degree of freedom systems, natural frequency, damping, damping ratio and log decrement. Base excitation. Free and forced vibration of two degree of freedom systems, vibration absorber. Numerical method for multi degree of freedom systems. Lateral vibration of continuous media; energy method, whirling of shafts. Introduction to transient vibration theory, vibration measuring instruments, Transmissibility and vibration isolation.

MEE 513: Tribology, 3 Units

Introduction. Some properties of solids, liquids and gases, viscosity. Introcluction to surface problems. Wear and friction. Lubrication; boundary Lubrication, Hydrodynamic lubrication. Mineral lubricating oils; types of lubricants, physical and chemical characteristics and additives. Lubricating synthetic lubricants. Lubricant application. Handling, storage and dispensing of lubricants

MEE 521: Thermodynamics IV, 3 Units (Prerequisite: MEE 423)

Thermodynamic relations and exact differentials, Maxwell relations. Combustion; fuels, air fuel ratios, first and second laws applied to combustion. Reciprocating I.C engines; indicator diagrams, performance criteria. One-dimensional steady flow, Isentropic flow in compressors; axial flow turbines and compressors.

MEE 531 Fluid Dynamics, 3 Units (Prerequisite: MEE 331)

Navier-stokes equations; mathematical derivation, simplified forms and application: Boundary layer theory; general outline, simplified equations and solutions solution, Irrotational fluid motion; circulation vortices, velocity potential and stream functions, solution methods and

applications. One dimensional compressible flow, governing equations sonic, subsonic and supersonic flows, shock waves. Isentropic flow. Fanon and Raleigh flows.

MEE 561 Production Management, 2 Units

Operational Re earch; linear programming, queuing theory, network analysis.

Productivity analysis. Factors influencing plant design. Production planning and control. Inspection and quality control, stage inspection, statistical control, control charts and applications. Work study; motion study and work measurements, job valuation and merit rating. Ergonomics. Inventory control. Value analysis; make or buy decisions.

MEE 581 Mechanical Engineering Laboratory II (2 Credits Units)

Laboratory experiments on electrical machines, machine elements, Automotive Engineering, Fluid Mechanics, Thermodynamics, Air-conditioning, refrigeration and ventilation.

MEE 591 Computer-aided Design & Manufacturing (3 Credits Units)

Review of computer hardware and software. Introduction to CAD/CAM and computer Integral Manufacturing (CIM). Geometric modeling. Engineering analysis. Automated drafting and manufacturing systems. Work piece handling. Continuous and intermittent transfer. The general mechanism. Programmable controllers and their programming. Numerical control and robotics, motion control, linear and circular interpolation. Programming numerically controlled machines. Basic concepts of robotics. **Laboratory:** practice using AUTOCAD for computer-aided drafting. CNC part programming to manufacturing selected jobs using computer. Design analysis and drafting with Personal Computers. Pre-requisite: Good academic standing.

FCE 571: Engineering Economics and Management, 2 Units

Time value of money, Techniques for Analysing Capital investments, Evaluation of Public Alternatives, Replacement Analysis, Make or Buy Decision, Management; meaning, principles and practice. Organization; principles, span of controls, delegation of authority, structure, formal and informal. Industrial ownership; partnership and joint company. Personnel management;

objectives and functions, recruitment and selection personnel development. Financial management; sources of financial, accounting and book keeping, cost planning and control.

MEE 522: Refrigeration and Air-I (Prerequisite: MEE 322)

Practical cycles: Refrigerants, vapour compression, gas water and absorption cycles. Design methods; refrigeration load, equipment selection. Air conditioning processes; analysis-using psychometric chart. Physiological principles and comfort indices; relative humidity, wet bulb temperature etc, Air conditioning design;. Equipment selection and plant layout layout.

MEE 532 Fluid Machinery, 3 Units (Prerequisite: MEE 331)

Fundamental concepts; definition fluid machines. Flow theory applied to rota-dyamic machines; moment-of-momentum equation, efficient specific speed and characteristic curves, compressible flow, isolated blade and cascade considerations. Turbines; application of flow theory to axial, radial and mixed flow turbines. Compressors; application of flow theory to axial flow, centrifugal and positive displacement compressors, blade design, stall cells, surge. Pumps; types, characteristics and cavitations.

FCE 532: Engineering law, Entrepreneurship and Industry, 2 Units

Industrial legislature, wages act, workers compensation act, industrial dispute act, employee insurance and trade union acts. Types of contracts and contract obligation. Company and partnership law, constitution, incorporation, registration, insolvency and bankruptcy. Industrial Psychology; group dynamics, moral, motivation, industrial fatigue. Trade union and their functions. Product liability.

MEE 542: Theory of Elasticity and Plasticity, 3 Units (Prerequisite: MEE 341)

Equations o equilibrium of stresses, compatibility of strains. Formulation of the general elastic problems; generation and application of stress functions, circular plate theory, membrane shells, energy and numerical methods. Experimental stress analysis using various techniques. Theory of plasticity; formulation of the elasto-plastic problem, various approximation methods of solution.

MEE 562 Maintenance Management, 2 Units

Maintenance objectives, organization of maintenance. Types of maintenance. Maintenance cost and budgeting. Reliability engineering.

MEE 583 Project, 6 Units

Final year experimental and/or theoretical project assigned to individual student under the supervision of member(s) of staff.

Supervised Industrial Works Experiences Schemes (SIWES)

During the S.I.W.E.S. periods, students are attached to industries to gain experience in research, design, manufacture, industrial processes, social and environmental services and the operation and maintenance of machines.

ACADEMIC REGULATIONS

Introduction

A number of academic regulations are in place for the conduct and guidance of students in academic matter.

1. Eligibility for registration for courses

A student admitted into the university is eligible to register for specific programme for which he/she was offered admission if he/she possess the necessary required or relevant qualifications.

2. Enrolment for courses

During registration at the beginning of every session, all student shall register in person all courses for which they are eligible by singing the course register for each course.

3. Concurrent enrollment

Student are not permitted to enroll concurrently in programmes of study in the Niger Delta University or in other educational institutions.

4. Class attendance

Attendance at lectures, tutorials, studio, laboratory, workshop and practical sessions, etc. is compulsory and **five (5) marks of the continuous assessment (CA) may be attributed to class attendance.** Every student is required to meet a minimum of 75% class attendance in order to

qualify to write examination in a given course. A student who has not meet 75% attendance is disqualified from writing the final examination and will be deemed to have failed examination.

5. Attendance registers

All registered students of the University are expected to attend all scheduled classes, including tutorials, laboratory work, and field trips. Student attendance at scheduled classes/tutorials shall be taken at every class /tutorials session and counter-signed by the Lecturer in charge. Attendance register for every course will be cross-checked by the Head of Department from time to time.

6. Duration of semester

The duration of a semester shall normally be eighteen (18) weeks, of which three weeks (3) weeks shall be reserved for the conduct of the end of semester examinations.

7. Suspension of studies

A registered student may for good cause (e.g. ill healthy, financial constraints) seek the approval of senate for suspension of studies through his/her faculty/department. **Suspension of studies when granted shall be for one (1) academic session only. An extension of suspension of studies beyond one academic session shall require the further consideration of senate**. A suspension of studies without senate's approval shall be null and void.

8. Resumption of studies

A student who wishes to resume studies after a period of suspension of studies **shall apply not later than two months before the beginning of the session by completing and submitting a resumption of studies form.** The evidence of the senate's approval for suspension of studies should be attached to the complete resumption of studies form obtained at the departmental offices.

9. Continuous assessment

Final assessment of students' work includes continuous assessment and this shall constitute not more than 30% of the total course. Every student must partake in the continuous assessment.

10. **Final examination**

There shall be a final examination for each registered course at the end of every semester. The final Examination shall constitute 70% of the total score in the course. Failure to write the final examination without senate approval shall attract an "F" grade

11. Absence from Examination(s)

A student, who absents himself/herself from schedule examination(s), will be deemed to have failed the examination(s).

A student may however be absent from examination(s) with permission from the senate. Such permission can only be granted by the senate following a formal application by the student to the senate through his/her Dean of faculty and Head of Department.

If a student is absent from examination(s) on permission, he/she will be allowed to write the examination(s) at the next available opportunity. The units of the course(s) shall not be used to compute the student CGPA in the semester in question.

12. Requests for Reassessment

A student may request for a reassessment of the quality of his/her work in a course examination during the semester not later than two weeks after publication of provisional Results by faculties. When a student makes such a request, he /she shall pay a reassessment fee of two thousand (₦2,000.00) naira which is subject to review from time to time. The application for reassessment shall begin only after presentation of evidence of payment. The report of the reassessment should be forwarded to Senate through the Faculty Board for consideration.

13. Student Academic Workload

All full-time student shall take a minimum of 15 credit units and a maximum 24 credit units per semester.

A Student may apply to the faculty Board through the Head of Department to take less or more than the prescribed limits (provided it is not less than 9 units and not more than 30 units). In cases where the total units to be taken is less than 9 units or more than 30 units, the approval of Senate must be obtained.

N/B where the requested unit is above 30 units the added unit must not translate into more than one (1) course.

14. Academic counseling

Students will be assigned Academic advisor in their departments who shall counsel them on academic matters and other university requirements and regulations. It is the responsibility of the student to take full advantage of this service.

15. Definition of a Credit Unit

A course credit unit is defined as one hour of lecture and one to two hours of tutorial/discussion, or two to three hours or practical (workshop, laboratory, or field work) per week per semester.

16. Grading system

Students' academic work shall be assessed at the end of ever semester using the following numerical scores and letter grades. The final classification of degrees shall also be in accordance with the students' final CGPA.

I. For students admitted into the university before the 2013/2014 academic session the following grading system shall apply:

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

II. For students admitted into the university from the 2013/2014 academic session the following grading system shall apply:

Mark%	**Letter Grade**	**Points**
70-100	A	5
60-69	B	4
50-59	C	3

45-49	D	2
40-44	F	0

III. Incomplete Grade (I)

A student may earn an incomplete Grade in a course if all the requirement of the course have not been met.

If the incomplete grade is not remedied at the next examination for the course, the student shall be assigned an "F" grade.

IV. Point for Letter Grades

For the purpose of computing the academic standing of students at the end of every semester, the letter grades by students shall have the following points: A=5; B=4; D=2; E=1 and F=0.

For students admitted into the university from the 2013/2014 academic session, the Points for Letter Grades are: A=5; B=4; C=3; D=2 and F=0.

V. Grade point (GP)

A Grade point for each course is the product of the point associated with a letter grade and the course unit. E.g. a student who has a B grade in a 3 unit course has a grade point of 4 x 3= 12 because the letter grade for b is 4 and being a 3 unit course the product is 12 i.e., (4 x 3)

Units of courses in which a grade of 'I' is earned are excluded from-point computation for the semester in which the 'I' or if 'I' changes into an 'F" grade, the units are included in the subsequent cumulated grade point averages.

VI. Total Grade Point

The total grade point is the sum of all the grade points in all the courses in given semester.

VII. Grade Point Average (GPA)

The Grade point average is calculated by dividing the sum of the grade points for every course in the semester by the total units attempted in a given semester.

$$GPA = \frac{Total\ Grade\ Points\ in\ a\ semester}{Total\ units\ attempted\ in\ the\ semester}$$

$$= \frac{\Sigma Grade\ point\ in\ a\ semester}{\Sigma Units\ attempted\ in\ the\ semester}$$

VIII. Cumulative Grade Point Average (CGPA)

The Cumulative Grade Point Average (CGPA) is the sum of the total grade points earned in all the semesters divided by the sum of the total number of units attempted in all the semesters.

$$CGPA = \frac{\Sigma Grade\ point\ in\ a\ semester\ in\ all\ semesters}{\Sigma units\ attempted\ in\ the\ semester\ in\ all\ semesters}$$

IX. Repeat Course Grade

When a student re-registers for and actually repeats a failed course and takes the examination in the course, he/she should be credited with the actual grade scored in the repeated examination. The new grade earned in a repeat course does not replace the 'F' grade in the student's record.

17. Clear Standing

A student is said to be on a clear academic standing, if he/she has at least an E grade or a D grade (for students admitted into the University from the 2013/2014 academic session) in all courses attempted in the University.

18. Academic Probation

A student shall be placed on academic probation if he/she fails to maintain a minimum CGPA of 1.00 at the end of the session in his/her 100 level of student or at the end of the session in his/her 100 level of student or at the end of the 1st semester in subsequent levels. The probationary status of a student shall be reversed if the student maintains a CGPA of at least 1.00 or 1.50 (for students admitted into the University from the 2013/2014 academic session) in any subsequent semester after the first year. The responsibility to reverse the probationary status rests with the student.

A preliminary notice of poor academic standing shall be given to a student on academic probation in writing by the University.

19. Withdrawal for Academic Failure (WAF)

A student shall be required to withdraw from the University for Academic Failure if he/she at the end of any session fails to maintain a CGPA of at least 1.00 or 1.50 (for students admitted into the University from the 2013/2014 academic session). However, this rule shall not apply to 100 level students.

A student in his/her final year of study who also fails to make a minimum CGPA of 1.00 or 1.50 (for students admitted into the University from the 2013/2014 academic session) may be allowed to continue studentship and register for courses in the following year on concessional grounds only. Such student who fails to make a minimum CGPA of 1.00 or 1.50 (for students admitted into the University from the 2013/2014 academic session) in the concessional year shall be asked to withdraw from the University.

A student who also fails to obtain a pass grade in a minimum of 40% of courses registered in the session shall also qualify for withdrawal from the University for Academic Failure. This rule applies to students at all levels including 100 level students.

However, a student in his/her final year of study who fails to obtain a pass grade in a minimum of 40% of courses registered in a session shall be allowed to continue studentship and register for courses in the following session on concessional grounds only. A student who fails to obtain a pass grade in a minimum of 40% of course registered in the concessional year shall be asked to withdraw from the University for Academic Failure.

20. Inter-Faculty Transfer

Students currently registered in any programme of study in the University and have a minimum CGPA of 2.00 may apply for transfer to another Department or Faculty.

A student seeking to transfer shall complete the Inter-Faculty Transfer Form and submit same to the Head of the Department from which the student is seeking transfer.

Any student who desires to change his/her programme of study may be permitted to do so under the following conditions:

i. A vacancy exists in the course of study in to which he/she seeks a change;

ii. He/she satisfies all entry requirements for admission into the desired course of study at the time the change is sought;

iii. Such change of course of study shall be subject to approval of Senate after due consideration by faculties and departments concerned.

21. Transfers from other Institutions

Student currently registered in any full-time programme in other Universities may transfer their programme of study to a related programme in the Niger Delta University at the beginning of a new academic session, provided that they have a minimum of CGPA of 3.00.

Duly completed application forms along with the applicants' transcripts shall be submitted to the Registrar at least two (2) months before the commencement of the session. There shall also be an attestation that the applicant was not dismissed for misconduct from other Universities. Inter-University Admissions shall be considered by the Committee of Provost and Deans (CPD) based on the recommendations of the appropriate Faculty Boards and students from other institutions would not be placed beyond the 200 level in the Niger Delta University.

22. Transfer of Credit Units from other Institutions

Students transferring from other recognized universities may be credited with units for courses successfully completed and which satisfy the course requirements of the programme for which the student is registered for at the Niger Delta University. The units and grades awarded shall be applied appropriately in the relevant desired degree.

23. Publication of results

The faculty boards shall publish the results of all examinations after approval by senate. However, faculty board may publish the provisional results of student after faculty board's consideration. Senate approved students result may be made available to parents/guardians at the end of every academic session.

24. Duration programmes

A student of four year degree programme shall normally be expected to complete the programme in eight (8) semester, but may be allowed to continue for a total of twelve (12)

semester and shall qualify for a classified degree provided he/she maintains a CGPA of 1.00 or 1.50 (for student admitted into the university from the 2013/2014 academic session) and above. **However, a student who is unable to complete the programme in twelve (12) semesters may be allowed to continue for an additional two (2) semester but shall be eligible for a pass degree only** in respective of student's CGPA. Note all students admitted into the university from the 2013/2014 session to pursue four-year degree programmes are required to complete their programmes in a maximum twelve (12) semesters. Student who cannot complete their programme of study within the maximum allowed period would be w2ithdrawn from the University for Academic Failure.

A student in a five year degree programme shall normally be expected to complete the programme in ten (10) semesters, but may be allowed to continue for a total of fourteen (14) semesters and still qualify for a classified degree provided he/she maintains a CGPA of 1.00 or 1.50 (for student admitted into the University from the 2013/2014 academic session) and above. **However, a student who is unable to complete the programme in fourteen (14) semesters may be allowed to continue for an additional two (2) semesters but shall be eligible for a pass degree only** irrespective of student's CGPA.

Note: All students admitted into the University from the 2013/2014 session to pursue five-year degree programmes are required to complete their programmes in a maximum of fourteen semesters.

Students who cannot complete their programme of study within the maximum allowed period would be withdrawn from the University for Academic Failure.

25. **Status of Courses**

All courses in t6he various degree programmes of the Niger Delta University are classified as follow:

i) Compulsory Courses

ii) Required Courses

iii) Elective Courses

i. Compulsory Courses:

These are courses that must be registered for in a given programme of study and for which the student must earn a pass grade to meet graduation requirements.

ii. Required Courses:

These are prescribed and specific courses that students in specific disciplines must register for and may not have to earn a pass grade but must earn a minimum score of 30% to meet graduation requirements.

iii. Elective courses

Elective courses are usually optional in nature. These are courses that broaden the students' understanding in particular aspects of specific disciplines. These courses also enable students to make up graduation requirements in term of credit unit and pass grade must be earned in them.

26. Graduation Requirements for Bachelor's Degree

In order to qualify for Bachelor's degree of the Niger Delta University, student must:

i. Earn a pass grade in supervised industrial work experience (SIWES) where applicable;
ii. Earn a minimum CGPA of 1.00 or 1.50 (for student admitted into the university from 2013/2014)
iii. Earn a minimum of 150 units including SIWES for a five-year programme or 120 units for a four-year programme.
iv. A transfer student must earn a minimum of 60 units for a four-year programme in Niger Delta University
v. A passing grade is required in all compulsory courses of a programme
vi. A minimum score of 30% must be obtained in required courses, and
vii. A student may take some elective courses to meet graduation requirements in which pass grades must be obtained.

27. Final Classification of Degrees

For the purpose of final classification of degrees, a student should have achieved one of the following CGPAs:

CGPA		CLASS OF DEGREE
4.50-5.00	-	First Class
3.50-4.49	-	Second Class (upper division)
2.40-3.49	-	Second class (lower division)
1.50-2.39	-	Third class
1.00-1.49	-	Pass

For students admitted into the University from the 2013/2014 academic session the CGPAs are as follows:

CGPA		CLASS OF DEGREE
4.50-5.00	-	First Class
3.50-4.49	-	Second Class (upper division)
2.40-3.49	-	Second class (lower division)
1.50-2.39	-	Third class

ACADEMIC STAFF LIST FOR DEPARTMENT OF MECHANICAL ENGINEERING

S/N	Name	COREN No	Rank	Date of First Appointment	Detailed of Qualifications			Specialization	Years of Teaching Experience	Dedicated/Shared	Credit Hours taught in the Current & last Semester	
					Degree	Year	Institution				First	Second
1.	Tolumoye J. Ajoko	R26809	Senior Lecturer	18/5/2010	PhD	2021	NDU	Thermal Power (Gas turbine)/ Renewable Energy	13	Dedicated	8	4
					MSc	2009	Cranfield					
					B.Eng	2007	NDU					
2.	Alexander N. Okpala	R7735	Professor	20/2/2008	PhD	2003	RSUST	Metallurgical and Production Engineering	15	Dedicated	6	4
					MSc	1997	FUTA					
					B.Eng	1991	FUTA					
3.	Adigio M. Emmanuel	R7174	Professor	25/2/2002	PhD	2003	Loughborough	Therno-Fluid	21	Dedicated	6	4
					MEng	1984	Ecole Uni.					
					B.Eng	1982	Uni. De Reims					
4.	OgbonanyaA. Ezenwa	R9535	Professor	14/2/2012	PhD	2004	RSUST	Ship Power Plant	11	Dedicated	8	6
					MEng	1998	RSUST					
					B.Eng		Uni. Of Ife					
5.	Burubai, Woyengi-Ebinipre	R12612	Professor	6/10/2012	PhD	2010	RSUST	Agricultural Processing and Storage	11	Dedicated	6	4
					MEng	2005	RSUST					
					B.Eng	2000	RSUST					
6.	Yelebe, Z. Robert	R13436	Professor	22/06/2005	PhD	2010	RSUST	Bio-Chemical Engineering/ Chemical Analysis	18	Dedicated	6	4
					MEng	2004	RSUST					
					B.Eng	2000	RSUST					
7.	Olala M. Olali	R12819	Senior Lecturer	10/6/2004	PhD	2008	Uni of Aviation	Thermo-Fluid (Aero-Space)	13	Dedicated	4	4
					MEng	1991	Kiev Instiitute					
					B.Eng							
8.	Yemi Philip Olisa	R20281	Senior Lecturer	21/11/06	PhD	2017	UNIBEN	Thermo-Fluid	17	Dedicated	4	4
					MEng	2002	UNILAG					
					B.Eng	1998	FUTY					

9.	Kotingo Kelvin	R18599	Senior Lecturer	25/2/2002	PhD	2022	NDU	Production	21	Dedicated	4	4
					MEng	2006	RSUST					
					B.Eng	1999	UNIPORT					
10.	Sibete Godfrey Ayeabu	R38427	Senior Lecturer	2/10/2019	PhD	2019	UNIBEN	Production	4	Dedicated	4	4
					MEng	2013	UNIBEN					
					B.Eng	2004	Ambrose Alli Unv					
11.	Ebizimor A. Kiridi	R15475	Senior Lecturer	26/3/2009	PhD	2013	UNI Ilorin	Soil and Water Engineering	14	Dedicated	4	4
					MEng	2006	UNI Ilorin					
					B.Eng	1998	RSUST					
12.	Kenneth Preye Aina	R47814	Senior Lecturer	18/2/2008	PhD	2018	University Van kaapstad	Renewable Energy Systems	15	Dedicated	4	4
					MEng	2010	Unv. of Nottingham					
					B.Eng	2006	NDU					
13.	Orukari, Jr. Bokumo	R61936	Lecturer I	1/10/2019	PhD	2018	Belarusian National Technical University	Production	4	Dedicated	4	4
					MEng	2011	Belarusian National Technical University					
					B.Eng	2010	Belarusian National Technical University					
14.	Amula Emomotimi	R12634	Lecturer I	05/12/1996	PhD	2021	NDU	Production	27	Dedicated	4	4
					MEng	2005	RSUST					
					B.Tech	1993	RSUST					
15.	Amos E. Angela	R22799	Lecturer I	18/5/2010	PhD	2021	NDU	Thermofluid	13	Dedicated	4	4
					MEng	2007	RSUST					
					B.Tech	1995	RSUST					
16.	Yabefa Branly Eric	R41494	Lecturer I	1/08/2017	PhD	2023	Univ. of Ibadan	Agricultural Engineering	6	Dedicated	4	4
					MTech	2015	Univ. of Ibadan					
					B.Tech	2011	RSUST					
17.	Geofrey Banje	R34369	Lecturer I	15/11/2010	PhD	In view	UNN	Structural Engineering	13	Dedicated	4	4
					MTech	2013	University of Surrey					

					B.Eng	2007	NDU					
18.	Arube Goodnews Emuakpo	R57863	Lecturer I	5/11/2019	PhD	In view	UNIBEN	Transportation and Highway Engineering	4	Dedicated	4	4
					MSc	2016	Coventry University					
					B.Eng	2012	NDU					
19.	Soroh B. Etaribo	In Progress	Lecturer II	02/10/19	PhD	In View	NDU	Thermofluid	4	Dedicated	4	4
					MSc	2014	Univ. of Hertfordshire					
					B.Eng	2013	Univ. of Hertfordshire					
20.	Agonga Fred	R45878	Lecturer II	02/10/2019	PhD	2017	Belarusian National Technical University	Production	4	Dedicated	4	4
					MEng	2011	Belarusian National Technical University					
					B.Eng	2010	Belarusian National Technical University					
21.	Obiga Otuami	R54142	Lecturer II	01/09/2019	PhD	2018	University of Nottingham	Thermo-Fluid	4	Dedicated	6	6
					MEng	-	-					
					B.Eng	2011	University of Nottingham					
22.	Biebelemo Jonathan Jethrow	R46700	Lecturer II	18/9/2013	PhD	In view	NDU	Farm Structures and Environmental Design	10	Dedicated	4	4
					MSc	2016	NDU					
					B.Eng	2012	NDU					

LIST OF FULL-TIME LABORATORY STAFF

S/N	Name	COREN No	Rank	Details of Qualifications			Specialization	Date of First Appointment	Laboratory Works Conducted (Contact Hours)	
				Degree	Year	Institution			Current Semester	Last Semester
1.	Uwokiri A. Combler		Chief Tgt.	PGD	2002	Uniport	Solid Mechanics	August, 2008	6	8
				HND	1997	Uniport				
2.	Odogu M.T. Baden		Chief Tgt.	HTD	2004		Thermo-fluid	October, 2008	8	4
3.	Tekinkio Meni		Chief Tgt.	HND	2003	Bori	Electrical/ Electronics	August, 2008	6	8
4.	Enaizigha Waidi		Assit. Chief Tgt	HND	2005	IAR&T	Automobile	2011	6	6
5.	Akene Woyengidinipre		Principal Tgt.	HND	2002	Uniport	Thermo-fluid	June, 2004	6	6
				ND	1996	Bori				
6	Kilakeme A. Tari	R55880	Senior Tgt.	M.Eng	2021	NDU	Thermo-fluid	July, 2004	8	8
				B.Eng	2011	NDU				
7	Patrick Augustina		Senior Tgt.	HND	2008	FPI	Solid Mechanics	January, 2011	4	6
8	Miebine S. Mabinton		Tgt. I	B.Eng	2010	NDU	Solid Mechanics	2004	4	4
9	Timbiri ThankGod		Snr. Techical Officer	NABTEB	2014		Craftman	30th August, 1981	4	4
10	Peter G. Omavie		Auto Technician	Trade Test	2014		Automobile	2014	4	4