



COURSE DESCRIPTION ON MECHANICAL ENGINEERING (FIVE YEARS PROGRAMM) FIRST SEMSTER YEAR ONE

MAT 111: GENERAL MATHEMATICS (2) UNITS

General mathematics set theory, subsets, union, intersection, complements, venn diadrams, Real numbers, integers, rational and irrational numbers. Mathematics induction, real sequences and series, theory of quadratic equations, Binomial theorem, complex numbers, algebra of complex numbers, the Argand diagram. De-moivre's, nth roots of unity. Circular measure, trigonometric functions of angels of any magnitude, addition and factor formulae.

ICH 111: GENERAL CHEMISTRY I (2) UNITS

Survey of organic Chemistry classes of organic compounds: Homologous Series Functional groups: purification of organic compounds: Stereochemistry: structure of organic compounds, Saturated and unsaturated hydrocarbons: AlCohLs, ketones etc. Comparison of phenols, amines, aromatic amines etc.

PHY 111: GENERAL PHYSICS I (2) UNITS

Definition, Unit and Dimension, Scalar and Vector quantities, Kinematics of Particles, Rigid bodies, Newton's law of motion, Forces, Vectorial representation, Motion of rigid bodies, Power, Energy, Angular momentum of rotating rigid bodies, work, enrgy, conservation of energy and momentum, Kepler's laws of planetary motion, center of mass, motion in a vertical circle, Friction



simple harmonic motion and gravitation, Elasticity, Hooke's Law, Pressure in fluids, Archimedes Principle, Surface Tension, damped and Forced Vibration.

CEE 111: INTRODUCTION TO COMPUTER AND INFORMATION TECHNOLOGY (2) UNITS

Quick review of number systems (binary, octal, decimal, hexadecimal, logic operations, flowcharts) pseudo code. Basic parts of a digital computer. Types of Computers (processing hardware), modern pc (system unit – motherboard –cpu, drives, power unit,etc). peripherals (printers, keyboard, mouse, monitors, digital video camera, scanners, sound, wireless devices etc). Introduction to computer system software (Dos, windows, unix, linux, macos) and application software (word processing, spreadsheet, database management systems graphics, electronic publishing, entertainment, utilities). Introduction to computer networks, the internet and multimedia system.

CHE 111: INTRODUCTION TO CHEMICAL PROCESS COMPUTATION I (2) UNITS

Scientific theory and law: The mole concept and material balance stoichiometry, Thermochemistry, Radioactivity and its applications Quantum number theory: mass-energy relationships: The periodic table.

EEE 151: INTRODUCTION TO ENGINEERING SCIENCE I (2) UNITS

FEG 101: ENGINEERING ANALYSIS I (2) UNITS



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Vector and Matrix algebra: Solutions of systems of Linear equations:
Eigen value and Eign Vectors: Complex value functions of a complex
variable: Canchy –Rieman equations: Analytic functions: Contour
Integrals and Canchy's theorem.



GST 101: USE OF ENGLISH

GOAL OF COURSE

Being a practice oriented course, GST 101 is designed to accomplish the following objectives:

1. Instill communicative confidence in students
2. Enable the students acquire competence in the technical aspects of the English language.
3. Help the students build a repertoire of rules which govern sentence construction, word-choice, writing reading, speaking and idiomatic as well as stylistic usage.
4. Train the students to appreciate literary works written in English.

Course History

GST 101 is an aspect of the Use of English course in the category of course in the mandatory General Studies programme prescribed for undergraduates in the 1989 NUC approved minimum academic standards for all Nigerian Universities. The NUC minimum academic standards assigns 4 credit units to the Use of English which is achieved by splitting the course into two GST 101 and GST 102 of 2 credit units each mounted respectively, in the first and second semesters. The Use of English is also expected to be mandatory taught in Polytechnics or similar tertiary institutions as prescribed in the 1990 NBTE General studies course specification.

Course Structure

The course GST 101 is structured and expected to be taught as follows:



| Unit | Theme | Content of Theme |
|-------------|-----------------|---|
| 1. | Introduction: | Introduction, relevance of course, estimate as remedial English. |
| 2. | The Sentence: | Structure, Kinds of sentences (declaratory, interrogatory, exclamatory, imperative), sentence combining to form complex, compound and complex-compound ones sentences, fragments. |
| 3. | Lexis: | The structure of English words (simple, complex, nature of affixes (morphemes) kinds of meaning (denotative, connotative, synonyms etc) idioms, pre-supposition. |
| 4. | Essay 1: | Aspects of the essay (content organization, expression, mechanics), the narrative Essay – purpose, nature, parts. |
| 5. | Reading: | Reading Comprehension, Techniques, readiness, problems, practice. |
| 6. | Note-Taking: | Listening Comprehension, attention, noting major points, summarizing, paragraphing, abbreviating, underlining or other emphatic techniques. |
| 7. | Letter writing: | Formal and informal letters, formal features, of letters; the differences. |
| 8. | Punctuation: | Meaning and uses of punctuation marks |



- including comma, full-stop, semi-colon, quotation marks etc.
9. Speech: The meaning and importance of speech, consonants and vowels, proper pronunciation, habits, intonation, pitch, assimilation, speech delivery (Written and oral).
10. Revision: Summary revision and examination.

Course Approach

1. Instruction in the course shall be by lectures supplemented with tutorials. Assignments and projects shall be given from time to time and shall account for 20 percent of the final evaluation of the achievements of the course objectives.
2. Regular students attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll call carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study of recommended textbooks reference books periodicals and other reading materials as may be directed from time to time by the lecturer(s).
4. Course evaluation will be either essay questions or objectives questions or combination both or the semi-essay/semi objective type of question

GST 103: PHILOSOPHY AND LOGIC (2) UNITS

Goal of Course



The overall aim of the course, GST 103 Philosophy and Logic is to train students to reason clearly and logically; to cultivate a critical attitude of mind and to be unassuming.

Course Objectives:

It is expected that at the end of the course the student will be able to:

1. Understand and apply the law of thought and principles corrects reasoning.
2. Free their minds from bias and look at things objectively.
3. Cultivate a critical, reflective and inquiring mind.
4. Understand the need for the application of the intellect to both theoretical and practical issues of life to escape avoidable unpleasant consequences of cordlessly spoken or written word or thoughtless actions.

Course History:

Philosophy and logic is one of the courses in the mandatory General Studies programmes for undergraduates prescribed in the 1989 NUC approved minimum academic standards for all Nigerian Universities. In the NUC academic standards being made reference to, Philosophy and logic is assigned 2 credit units under the course number GST 103. All undergraduates must pass the course to qualify for a first degree in any of the Nigerian Universities.

Course Structure

Philosophy and logic is in two sections (A & B). Section A comprises Philosophy while section B is made up of Logic. Both sections are caught concurrently throughout the duration of the course. The details of the themes and contents covered in each section of the course and the order of their delivery are as follows:



SECTION A: PHILOSOPHY

| Unit | Theme | Content of Theme |
|------|---------------------------|--|
| 1. | Introduction | The concept: Philosophy”, its origin and Etymology; relation with wisdom, popular philosophical conception; philosophy and wisdom. |
| 2. | The Nature of Philosophy; | Popular conception of Philosophy, of philosophical enquiring; aims of Philosophy. |
| 3. | Philosophy as a Science | Science of first principles, Science of Sciences. |
| 4. | Philosophy and thinking | Popular conception of thinking the nature of philosophical thinking, the implications of philosophical thinking. |
| 5. | Division of Philosophy | Speculative/theoretical philosophy; Historical general and particular history of philosophy and philosophy of history; systematic-metaphysics and epistemology; practical axiology and criteriology; axio-logy-ethnics and aesthetics; criteriology-logic and philosophies |
| 6. | Main issues: | Problems of reality versus appearance materialism, monism, Dualism, Pluralism, Positivism, etc; the problems of truth-realistics, idealisms, dogmatists, |



- skpetists, and acclectist perspectives; the problem of rationalists, empiricist, intellectualists perspectives the problem of values.
7. Usefulness of Philosophy In daily life
8. Revision: Summary, revision and examination.

SECTION B: LOGIC

| Unit | Theme | Content of Theme |
|-------------|----------------------------|---|
| 1. | Introduction | meaning, object and divisions of Logic as a science and an art. |
| 2. | The law of thought | The laws of contradiction, identity and excluded middle. The operations of the mind; Simple appreciation, judgment and reasoning. |
| 3. | Arguments and Proposition: | Deductive and inductive arguments, concepts, terms and propositions. |
| 4, | Syllogism: | The character and types of syllogism, categorical, hypothetical and disjunctive syllogisms. |
| 5. | Fallacies: | Fallacies of relevance and ambiguity, truth and validity. |
| 6. | Revision: | Summary, revision and |



examination.

Course Approach

1. Instructive in the course shall be by lectures supplemented with tutorials. Assignments and projects shall be given from time to time and shall account for 20 per cent of the final evaluation of the achievement of the course objectives.
2. Regular students attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study of recommended textbooks, periodicals and other reading materials as may be directed from time to time by lecturer(s).
4. Course evaluation will be by either essay question or objective question or a combination of both or semi-essay , semi-objective questions.

GST 104: HISTORY AND PHILOSOPHY OF SCIENCE (2) UNITS

Goal of Course

The goal of the course GST 104 is to educate students about science; its origin, uses and abuses and its impacts on man and the environment.



Course Objectives:

Being guided by the notion that man, nature and the environment are the central focus in science and the logic that for man to live in harmony with nature and the environment he needs to understand science; the course is designed to enable students to:

1. Understand the historical aspects of the development of science and its Philosophy.
2. Know the scientific method.
3. Understand the origin of life including the origin of man and the cosmic influences of man.
4. Appreciate the consequences of man's activity on the physical environment especially with respect to pollution of environment, chemical waste and radio chemical hazards.
5. Understand the role that science and technology could play in the services of man and the future of society.

Course History

The course GST 104: History and Philosophy of Science is one of the mandatory General Courses prescribed in the 1999 NUC approved minimum academic standard for all Nigerian Universities. The NUC minimum academic standards assigns 2 credit units to the course under the course number GST 102. Undergraduates are required to pass the course to qualify for a university degree.

Course Structure

The GST 104 is structured and to be taught on a thematic basis as indicated below.

| Unit | Theme | Content of Theme |
|-------------|--------------|-------------------------|
|-------------|--------------|-------------------------|



1. Introduction: Introduction, relevance of course and Scope of History and Philosophy of Science.
2. Historical aspects of the development of science, science and Philosophy Definition of science difference science disciplines; definition of philosophy. The relationship between science and philosophy Contributions of the Egyptian Greeks and Romans to the growth and development of science and Philosophy. Overview of some scientific inventions and their roles in the growth of modern science. Early notions, myths and beliefs about diseases, including the controversy surrounding the origin of HIV.AIDS.
3. The Scientific methodology: Definition of the scientific methodology, History aspects of the development of scientific methodology. Different processes of the scientific methodology with emphasis on observation, experimentation, trial and error, statistical and sampling techniques. Different steps of the scientific methodology.
4. Man's origin, nature and cosmic Definition of life including definition and nature of man. Theories of the origin of life including the origin of man. The



- environment:
- continuity of life including an overview of early thoughts and events that bore modern genetics, organic evolution, embryology and embryology; Definition of environment, types of cosmic influence in man.
5. Environmental effects of chemical, plastics, textile waste etc: Definition of environmental pollution; origin and causes of environmental pollution. Consequences of environmental pollution with emphasis on environmental effects of metal, organic compounds etc.
 6. Chemical and radio- chemical definition of chemical and radio- chemical hazards. Causes and consequences of chemical and radio-chemical hazards.
 7. Man and his energy resources; the renewable and non-renewable resources: Definition of energy. Different forms of energy. Sources of energy. Types and uses of renewable energy resources with emphasis on minerals and fossil fuel resources. Types of energy reserves (Fuel wood, and natural gas, coals, nuclear power).
 8. Science and Technology in The society and Service of man: definition of science and technology. The relationship between science and technology. Historical philosophical basis for the development of science and



technology (including the early man's struggle for survival). The applications of science and technology in the society and service of man- with emphasis on entertainment and recreation, medicine, welfare etc. the implication if biological research in medicine (including experiments, vaccine production) and agriculture plant breeding etc) spare travel and space explorations, etc.

9. Agriculture:
And resources
Allocation:

Agriculture goals, means and limitations.

The Environment.

- the living environment
- the physical environment
- the economic and social environment.

Living aquatic resources present status of exploration and future challenges.

10. Revision:

Summary, revision and examination.

Course Approach

1. Instruction in the course shall be by lectures supplemented with tutorials. Assignments and projects may be given from time to time and may account for 20 percent of the final evaluation of the achievement of the courses.



2. Regular students' attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study or recommended textbooks, reference books, periodicals and other reading materials as may be directed from time to time by the lecturer(s).
4. Course evaluation will be either essay question or objective questions or semi-essay/semi-objective type questions.

GST 107: NIGERIAN PEOPLES AND CULTURE (2) UNITS

Historical Evolution of Nigeria

Archaeological Discoveries in Nigeria and their Role in Nigerian culture.

- A. The concept of Archaeology
- B. Archaeological sites and Historical reconstruction in Nigeria
- C. Some Archaeological sites in Nigeria
 1. Igbo-Ukwu sites
 2. Benin Excavations

ARCHAEOLOGY DISCOVERIES

Usama site

The City walls

The Nok culture

The importance of Nok culture in Historical reconstruction

The Ife site

Diyama site

CULTURAL EXPRESSION IN NIGERIA – MUSIC



- A. Meaning of music
- B. Music as a universal language
- C. Music as a language of the soul
- D. Characteristics of a musical sound
 - i. Pitch (ii) Volume or Intensity (iii) Quality or Timbre
 - (iv) Duration.

CULTURAL EXPRESSION IN NIGERIA HISTORICAL TRENDS OF MUSIC:

- (i) Music culture
- (ii) Types of contemporary music

(A) Art music (B) Secular music (C) Concept Music
(D) Traditional instrumental music

IMPROVISED MUSIC

POPULAR MUSIC

WIDHOOD IN NIGERIA

DEPORABLE TREATMENT USUALLY METHOD OUT TO WIDHOOD

Kogi State, Adamawa State, Kwara State, Benue state, Lagos State, Ondo State, Edo State, Anambra State, Cross River state River State

FACTORS ENCOURAGING OBNOXIOUS WIDHOOD PRACTICES

1. Involvement of the sisters of the dead one
2. Illiteracy
3. Religion
4. Customs/Traditions



5. Mall Chauvinism

SECOND SEMESTER YEAR ONE

MAT 112: MATHEMATICS II (2) UNITS

Mathematical modeling of physical systems, numerical techniques, boundary value problems, Fourier integral, Fourier series, orthogonal functions, and Sturm-Liouville systems, partial differential equations including theory, classification and solution by various methods.

PHY 112: GENERAL PHYSICS II (2) UNITS

TEMPERATURE AND HEAT

Concepts of heat. Temperature. Measurement of Temperature. Clinical thermometer. Heat capacity. Specific Heat. Latent Heat. Calorimetry. Gas Laws; Kinetic Theory of gases, Thermal energy, Isothermal and Adiabatic Changes. Conduction, Convection; Radiation.

PART TWO

SOUND

Sound Waves; Intensity, pitch and quality of sound. Propagation of sound in Solids, liquids and gases. Doppler effect. The Ear.



PART THREE

LIGHT

Reflection and Refraction of light, Plane and Spherical Mirrors, Thin lenses; Optical Instruments. The Eye, Defects of vision and Their Corrections. Wave Nature of Light, Interference, and Diffraction. Velocity of Light

ICH 112: GENERAL CHEMISTRY II (2) UNITS

Introduction, the Alkanes, Homologous, General Molecular formula, Isomerism, Nomenclature, Functional groups, Saturated and unsaturated compounds, unsaturated hydrocarbons, Stereochemistry, Geometric Isomerism, Petroleum, Fractional distillation of petroleum, Adiabatic and Diathermal boundaries, state variables, Equilibrium.

CEE 112: COMPUTER PROGRAMMING AND LANGUAGE I (2) UNITS

Introduction to a High-level language suited to Scientific computations (e.g. FORTRAN, Pascal C. etc.) and to another high-level language geared towards business applications (e.g. COBOL). Topics covered include: variable, constants, Expressions. Integer and real modes of programming operators: Looping and transfer of control list arrays and subscripted variables functions and subroutines graphics programming projects.

CHE 112: INTRODUCTION TO CHEMICAL PROCESS COMPUTATION II (2) UNITS



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Chemical/energetic calculations: free energy changes and spontaneity of electrochemical reactions. PH of solutions: Conductivity and resistivity of electrolytes.



CVE 111: APPLIED MECHANICS – STATICS (2) UNITS

Forces, moments, couples, Equilibrium of simple structures and machine parts,. Friction, First and second moments of area; centroids, kinematics of particles and rigid bodies in plane motion. Newton's laws of motion, kinetic energy and momentum analyses.

EEE 152: INTRODUCTION TO ENGINEERING SCIENCE II (2) UNITS

FEG 102: ENGINEERING ANALYSIS II (2) UNITS

Ordinary differential equations of the 1st order and solution techniques: Sources of differential equations – biological and physical: Numerical methods of solution of 1st order o.d.e: Complex variables: Laplace trans form.

GST 105: CITIZENSHIP EDUCATION (2) UNITS

Goal of course

The goal of the course is to teach and make students know the provisions of the Constitution of the Federal Republic of Nigeria with a special emphasis on the workings of the federal system of Government; the right privilege and obligations of citizens and the fundamental objectives and directive principles of state Policy of Nigeria.

Course Objectives

It is expected that students after completion of the lectures in the course should be able to:

1. Understand the Constitution of Nigeria.
2. Understand the Federal System of government of Nigeria.



3. Know the Constitutional rights and obligations of Nigerian Citizens.
4. Understand citizenship.
5. Know the fundamental objectives and directive principles of state Policy of Nigeria.

Course History

GST 105 and its supplement GST 106, together, replace GST 202 (Nigerian Peoples and Culture) which use to be taught in universities in accordance with the 1989 NUC approved minimum academic standard for all Nigerian universities. Both GST 105 and GST 106 also replace GNS 16) (Contemporary Social Problems and Outline History of Nigeria) previously taught in Polytechnics as provided in the 1990 National Board for Technical Education (NBTE) general Studies course specifications. GST 105 and GST 106 were prescribed as mandatory General studies courses in all Nigerian universities, Polytechnics and Colleges of Education fro the 1992/93 Session and endorsed by the NUC, NBTE and the national Commission on Colleges of education (NCCE). This was sequel to the directive in 1991 by the Federal Government of Nigeria (during the General Ibrahim Babangida administration) that citizenship education should be mandatorily taught as part of the General Studies programme in tertiary education institutions in Nigeria.

This directive for the introduction of Citizenship Education in the general studies curricula of tertiary institutions was informed by the perceived national need to expose all students to the practical issues in good governance, good health and national development so as to enhance the citizens capacity for appropriate political, social ad moral



behaviours needed to foster orders, democracy and progress in the Nigerian society

By so doing it is hoped that the way will be paved for the overall achievement of the five national objectives of the Nigerian state as stated in the Section National Development Plan, and endorsed as the necessary foundation for any national policy on education. The National objectives are the building of:

1. A free and democratic society.
2. A just and egalitarian society.
3. A united, strong and self-reliant nation.
4. A great and dynamic economy.
5. A land of bright and full opportunities for all

Course Structure

GST 105 is structure and expected to be delivered as follows:

| Unit | Theme | Content of Theme |
|-------------|------------------------|---|
| 1. | Introduction: | Meaning, philosophy and scope of Citizenship Education I. |
| 2. | Nigerian Constitution: | Definition ad functions of constitutions and their effectiveness; historical development of constitutions in Nigeria with emphasis on their landmarks, merits and demerits; the provisions of the 1979 constitution; supremacy of the Nigeria constitution; the concept of “rule of law”. |
| 3. | The Federal | Meaning and function of |



- system of Nigeria: government; Forms of government – unitary, federal, confederal – with emphasis on their distinguishing features; the evolution, structure and basis of the federal system of government in Nigeria – local, state and federal and their relationships; sources of revenue and revenue allocation formula in operation in Nigeria.
4. Nigerian citizenship: Meaning, significance and benefits of citizenship; types of citizenship and their merits and demerits, mode of acquiring Nigerian citizenship; avoidance of dual citizenship and deprivation of citizenship, duties of Nigerian citizen.
5. Rights and obligations of Nigerian citizens: Fundamental rights as provided for in the Nigerian constitution viz. right to life; right to dignity of human person; right to eradicate corrupt practices; right to personal liberty, right to fair hearing, right to private and family life; right to freedom of thought; conscience and religion; right to peaceful assembly and association; right to freedom of movement; right to medical consultation; right to freedom of discrimination, right to acquire and own property anywhere in the federation; restriction on and derogation from fundamental right; government's protection from and enforcement of fundamental right.



6. Fundamental objectives and directive principles: of state policy Nigeria
Fundamental obligations of government towards the people, political, economic, social, educational and foreign policy objectives of Nigeria; directive principles of State Policy on the environment, culture, mass media, national ethnics and values; assessment of the fundamental objectives and directive principles of state policy by government and people of Nigeria, commended improvements on the provision, conformity, observance and application of the fundamental objectives and directive principles of state policy.
7. Revision: Summary, revisions and examination.



Course Approach

1. Instruction in the course shall be by lectures supplemented with tutorials. Assignments and projects shall be given from time to time and shall account for 20 percent of the final evaluation of the achievement of the course objectives.
2. Regular students' attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study of recommended text-books, reference books and periodicals and other reading materials as may be directed from time to time by the lecturer(s).
4. Course evaluation shall be by either essay questions or objectives questions or a combination of both or the semi-essay/semi-objective question type.

Citizenship Education II

| | | |
|-----------------------------------|--------------------------|----------|
| Course No. | GST 106 Credit: | 2 Units |
| Duration: | One semester of 15 weeks | |
| No. of Contact hours per weeks | | 2 hour |
| No. of Contact hours per semester | | 30 hours |

Goal of Course

The course is set out to teach and foster in the minds of Students the knowledge of Nigerian political institutions and structures; democratic principles and attitudes; nationalism and patriotisms; discipline and good environmental habits.



Course Objectives

The course is designed to enable students accomplish the following:

1. Understand the workings of government political parties elections.
2. Demonstrate knowledge of the arms of government and the conditions for their efficient functioning.
3. Understand constituted authority, and its role in the organization of society and the need for subjection to authority.
4. Understand national identity and its expression through symbols, heroic acts and the bestowment of national honours and merit awards.
5. Know and appreciate the importance of national ethics and discipline in national life.
6. Understand the need for and the ways of environmental protection and the activities of environmental protection agencies at federal, state and local levels.

Course History

As stated earlier the two courses on Citizenship Education –GST 105 and GST 106 found their way into the General Studies curriculum in tertiary education institutions in Nigeria from the 1992/93 academic session based on the directive from the federal government in 1991 to the effect that Citizenship Education should be mandatorily taught to all tertiary students in Nigeria for the effective mobilization of the students to achieve the broad national development objectives of Nigeria.



Course Structure

The course is structured and programmed to be taught as indicated below:

| Unit | Theme | Content of Theme |
|-------------|--|---|
| 1. | Introduction | Overview of the philosophy and scope of Citizenship education II. |
| 2. | Government, political parties and elections: | Need for government, attributes of government; electoral system, role and importance of political parties, in election, role and importance of civil service. Political parties, interest groups, public opinions and propaganda in elections, need for free and fair elections. |
| 3. | Arms of government: | Functions of the various arms of government legislature, executive and judiciary at Federal, state and Local Government levels; relationship among the three arms of government: principles of “Separation of Power” and “Check and balances” in government; Independence of Judiciary” election/appointment and removal of the Executive at the three levels of government: Code of conduct for Public |



officers, accountability of public functionaries, the mass media as an eye on government and its performance so far.

4. **Constituted Authority:** Meaning of constituted authority: types of constituted authority and their differences; meaning of bureaucracy, its characteristics, advantages; forms of delegated authority in modern state; distinction between power and authority; forms and effects of abuse of power and remedies for abuse of power; “leadership” and “followers in nation building; qualities of good leaders and good followers.

5. **National identity:** Need for ways of preserving national identity; role and significance of national symbols; contributions of selected heroes and heroines towards the development of Nigeria; various cultural groups in Nigeria and the need to preserve Nigeria’s indigenous cultures; cultural diversity and national integration/nation building.



6. National ethics and discipline in national life: Explanation of the need for national ethics; relating to various aspects of national ethics to national development; causes and consequences of indiscipline in the nation; methods used by public agencies in the control of indiscipline; need to maintain the right attitude towards public property.
1. Environmental protection: concept of environment; components of the Nigerian environment; impact of the environment on human development; ways of reducing over exploitation of the environment; different forms, causes and effects of population in the environment; different methods used for the conservation of the environment; importance and effectiveness of national and international conservation agencies.

Revision: Summary, revision and examination.

Course Approach

2. Instruction in the course shall be by lectures supplemented with tutorials. Assignment and projects shall be given from time to time and shall account for 20 percent of the evaluation of the achievement of the course objectives.



3. Regular students' attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.

10. Students are expected to make their notes during lectures and supplement with private study of recommended textbooks, reference books, periodicals and other reading materials as may be directed from time to time by lecturer(s).

11. Course evaluation will be by either essay questions or objective questions or combination of both or semi essay/semi-objective type questions.



GST 207: ENTREPRENEURIAL DEVELOPMENT I (2) UNITS

Entrepreneurial theories interpersonal characters and behavioural traits of entrepreneurs. Financial aspects of entrepreneurs. Financial aspects of entrepreneurship in which business success is most commonly reflected. External aspects of entrepreneurship. Legal forms of Business. Sources of Funds, Planning the business. Purchasing and Supply. Insurance and entrepreneurship. Feasibility Studies. Time management. Stress and Burnout. Budgeting, Team Building. Conflicts and Conflict resolution. Project evaluation. In addition to the lectures, experts may be invited from inside and outside the University system to deliver talks from time to time.

GST 202: HUMANITIES I (2) UNITS

STUDY I

HUMANITIES, REGION AND DEVELOPMENT –DR S.C CHUTA –

Definition of the subject matter

- ❖ An ancient civilization.
- ❖ The middle Ages.
- ❖ Medieval Scholarsticism.
- ❖ The Renaissance
- ❖ Humanism and scientific Revolution

STUDY II

“MAN KNOW THYSELF” (MAN: Nature and Progress)

- Chukwadozie Charles . N.

General introduction of the topic – Throughout history man has made tremendous efforts to know himself, understand nature, tap,



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organize and manipulate the force around him and within himself with the aim of self-actualization and general progress.



Characteristics of Man as an Animal

- i) Biological nature of man
- ii) Rationality
- iii) Auto-Transcendence
- iv) Home-Faber-man a tool-wielding being
- v) Man-a social being
- vi) Man-a cultural being
- vii) Historicity
- viii) Home Volens: Man a being gifted with freedom
- ix) Man: An end in Himself
- x) Man: An Aesthetic being
- xi) The contemporary man and his Estrangement.

STUDY III

Logic and civilization – By Obiora Anichebe – Introduction – Man originally weeded in the state of nature, no society, no state and no government. He was bereft of ideas of communal wrong and was at the mercy of the vagaries of nature. This was man in his primitive nature. Later, however, man began to form societies so as to reap the fruits of gregarious life and overcome the deficiencies of living in the state of nature.

- Definition, scope and importance of logic
 - Brief History of logic
 - Terminologies in logic
- (a) Proposition (b) Conclusion (c) Premises (d) Syllogism
(e) Argument (f) Validity (g) Truth (h) Axioms (i) Inference
- Deductive and inductive Argument



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- Fallacy



Types of Fallacies

- 1). Argumentum and Ignorantium
 - 2). Argumentum and Baculum (appeal to force)
 - 3). Argumentum and Hominem
 - 4). Genetic fallacy
 - 5). The quoque (you are Another)
 - 6). Argumentum and verecundiam (appeal to authority)
 - 7). Argument and miseriodiam (appeal to pity)
 - 8). Argumentum and populum (appeal to the people)
 - 9). Fallacy of false cause (Non-causa Procausa)
 - 10). Fallacy of Accident
 - 11). Fallacy of converse Accident (Hasty Generalization)
 - 12). Ignoratio Elench (irrelevant conclusion)
 - 13). Petitio principii (Bagging the question)
 - 14). Fallacy of complex questions
 - 15). Fallacies of ambiguity (double meaning) (a) Equivocation
(b) Amphiboly (c) Account
 - 16). Fallacy of Decision
- Logic as the propeller of civilization



GST 102: USE OF ENGLISH II (2) UNITS

GST 102 is intended to consolidate the competence in the Use of English acquired by students who offered GST 101 and also train the students in the Use of Library. Particularly emphasized in the application of acquired skills to written communication and gaining skills in information acquisition.

Course Objectives

The course shall accomplish the following objectives:

1. Expose students to various writing techniques with a move intensive practice on composition, letter/report writing and essay techniques culminating in the term paper.
2. Train the students in speech practices, literary forms and literary criticism.
3. Expose the students in speech, literary forms and literary criticism.

Course History:

GST 102 is the second segment of the Use of English course prescribed in the 1989 NUC approved minimum academic standards for Nigerian Universities. It is also prescribed as mandatory course in the 1990 NBTE. General Studies course specifications for Polytechnics and similar tertiary institutions.

Course Structure

GST 102 is structured and expected to run as indicated below:

| Unit | Theme | Content |
|-------------|-------------------------|---|
| 1. | General Introduction | Review of previous programme; overview of present course; essay content organization etc. |



2. Argumentative features of the argument; syllogism,
 essay: inductive and deductive logic; pitfalls to
 avoid (e.g. fallacy of premise, middle term
 and conclusive, over-generalisation etc);
 organizing the essay in four paragraphs
 (introduction, reputation of opposing
 views, presentation of main points,
 conclusion); examples of argumentative
 essays; possible essay.
3. Descriptive To be viewed as scientific writing, use
 essay: (e.g. to give objective accounts,
 difficulties (e. g choice of appropriate
 vocabulary etc), organization of
 paragraphs each with a theme paragraph
 unit.
4. Expository Purpose (explanation of concepts), uses
 essay: for abstract and philosophical writing
 organization emphasizing them and unit
 or logic.
5. Report Writing minutes of meetings and reports
 essay: practice in reported speech and passive
 voice coding or numbering of minutes.
6. Language What is fiction? Literary forms using a
 and literature: least 2 different novels to explain
 character, plot, theme lesson (if any
 language forms).
7. Language Continues as in 6 above as need be.



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And literature:

8. The term paper: Nature and use, choosing a topic; organization, notes and bibliography. Actual term paper based on novels read or other relevant theme.



- | | |
|---------------------------------|---|
| 9. Acquisition of information: | Use of library, library services and organization; library stock; catalogue; classification, reference sources. |
| 10. Acquisition of information: | Use of reference and index cards, reference and bibliography |
| 11. Speech practice: | Differences between phonetic and normal Orthography; practice in difficult phoneiness. |
| 12. Speech practice: | Oval delivery and practice; speech writing and delivery. |
| 13. Revision: | Summary, revision, submission of term paper and exams. |

Course Approach

1. Introduction course shall be by lectures supplemented with tutorials. Assignments and projects shall be given from time to time and shall account for 20 percent of the final evaluation of the achievement of the course objectives.
2. Regular students attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study of recommended text books, reference books, periodicals and other reading materials as may be directed from time to time by the lecturer(s).



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4. Course valuation shall be by either essay questions or objectives questions or objectives questions or combination of both or semi-essay semi-objective type questions.



| Unit | Theme | Content of Theme |
|-------------|--------------------------|---|
| 1. | General Introduction: | Review of previous programme; overview of present course; essay content organization etc. |
| 2. | Argumentative essay: | Features of the argument; syllogism, inductive and deductive logic; pitfalls to avoid (e. g fallacy of premise, middle term and conclusion, over-generalisation etc); organizing the essay in four paragraphs (introduction, reputation of opposing views presentation of main points, conclusion); examples of argumentative essays; possible essay. |
| 3. | Descriptive essay: | To be viewed as scientific writing; use (e. g to give objective accounts), difficulties (e. g choice of appropriate vocabulary etc), organisation of paragraphs each with a theme; paragraph unit. |
| 4. | Expository essay: | Purpose (explanation of concepts), uses for abstract and philosophical writing organization emphasizing them and unit or logic. |
| 5. | Report writing: | Writing minutes of meetings and reports practice in both reported speech and passive voice, coding or numbering of minutes. |



6. Language and literature: What is fictions? Literary forms using at least 2 different novels to explain character, plot, theme lesson (if say language forms).
7. Language and literature: Continues as in 6 above as need be.
8. The term paper: Nature and use, choosing a topic; organization, notes and bibliography. Actual term paper based on novels read or other relevant theme.
9. Acquisition of information: Use of library, library services and organization, library stock; catalogue; classification, reference sources.
10. Acquisition of information: Use reference and index cards, reference and bibliography.
11. Speech practice: Differences between phonetic and normal orthography; practice in difficult phoniness.
12. Speech practice: Oral delivery and practice; speech writing and delivery.
13. Revision: Summary, revision, submission of term paper and exams.

Course Approach

1. Instruction: a course shall be by lectures supplemented with tutorial. Assignments and projects shall be given from time to time and shall account for 20 percent of the final evaluation of the achievement of the course objectives.



2. Regular students attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study of recommended text books, reference books, periodicals and other reading materials as may be directed from time to time by the lecture(s).
4. Course valuation shall be by either essay questions or objectives questions or combination of both or semi-essay semi-objectives type questions.

FIRST SEMESTER YEAR TWO

CEE 213: COMPUTER PROGRAMMING AND LANGUAGE II (2) UNITS

Introduction to a High- level language suited to Scientific Computations (e.g. FORTRAN, Paschal, C. etc) and to another high level language geared towards business applications (e.g. COBOL). Topics covered include: Variables, Constants, Expressions: Integer and real modes of programming. Operators: Looping and transfer of Control: List arrays and Subscripted variables: Functions and Subroutines, graphics Programming Projects.

CHE 211: FLUID MECHANICS (2) UNITS



Properties of fluids; Thermodynamics of flow process; Buoyancy and stability of objects; Conservation laws; Dimensional analysis and similarity; Boundary layer concept; Applications of fluid mechanics.

CVE 212: APPLIED MECHANICS – DYNAMICS (2) UNITS

Hooke's law: stresses and strains due to loading and temperature changes, Torsion. The areas circle, deflection of beams with synanetrical and combined loadings. Elastic bucking of columns, Shear forces and bending moments, analytical and graphical methods for structures.

EEE 211: APPLIED ELECTRICITY II (2) UNITS

Basic machines – DC, synchronous alternators, transformers, equivalent circuits. Three phase balanced circuits, PN junction Diode, Transistors, Thyristors, FETs, Zener, Rectifiers. Basic control systems, open/closed loop systems. Communications fundamentals, introduction of TV, Radio, Telephone systems.

FEG 203: ENGINEERING ANALYSIS III (2) UNITS

Vector and matrix algebra; Solutions of systems of linear equations; Eigen values and eigen vectors; Complex value functions of a complex variable; Cauchy – Riemann equations; Analytic functions; Contour integrals and Cauchy's theorem.

MEC 211: ENGINEERING DRAWING I (2) UNITS



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Drawing instruments and equipment: Letting: Bisection of lines and angles: Construction of triangles, rectangles and squares circles tangency problems: Construction of polygons, ellipse, parabola, hyperbola, cycloid, involutes, etc. Orthographic projection (1st and 3rd) angle using simple objects.

MEC 251: WORKSHOP PROCESSES AND PRACTICE I (2) UNITS

Safety measures in the workshops: workshops hand and powered tools: workshop materials: gauges, micrometer, etc. Drilling machine and drilling process: Screw threads and thread cutting using stocks and die: Grinding drilling lathe, milling and shaping machine: practice in the use of the machine.



MME 253: MATERIAL SCIENCE (2) UNITS

Design, processing and environmental influence on engineering materials, Deformation, fatigue, creep-rupture, stress-corrosion. Strengthening mechanisms. Elasticity, plasticity and dislocations in fabrication of engineering materials. Metallurgical considerations in metal processing. Material selection, service failure and correction.

GST 223: CITIZENSHIP EDUCATION II (2) UNITS

Goal of Course

The course is set out to teach and foster in the minds of students the knowledge of Nigerian political institutions and structures; democratic principles and attitudes; nationalism and patriotism; discipline and good environmental habits.

Course Objectives

The course is designed to enable students accomplish the following:

1. Understand the workings of government political parties elections.
2. Demonstrate knowledge of the arms of government and the conditions for their efficient functioning.
3. Understand constituted authority, and its role in the organization of society and the need for subjection to authority.
4. Understand national identity and its expression through symbols, heroic and patriotic acts and the bestowment of national honours and merit awards.
5. Know and appreciate the importance of national ethnics and discipline in national life.



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6. Understand the need for and the ways of environmental protection and the activities of environmental protection agencies at federal, state and local levels.



Course History

As stated earlier the two courses on Citizenship Education – GST 105 and GST 107 found their way into the General Studies curriculum in tertiary education institutions in Nigeria from the 1992/93 academic session based on a directive from the federal government in 1991 to the effect that Citizenship Education should be mandatorily taught to all tertiary students in Nigeria for the effective mobilization of the students to achieve the broad national development objectives of Nigeria.

Course Structure

The course is structured and programmed to be taught as indicated below:

| Unit | Theme | Content of Theme |
|------|--|--|
| 1. | Introduction | Overview of the philosophy and scope of Citizenship Education II. |
| 2. | Government, political parties and elections: | Need for government, attributes of government; electoral system, role and importance of civil service, Political parties, interest groups, public opinions and propaganda in elections, need for free and fair election. |
| 3. | Arms of government: | Functions of the various arms of government legislature, executive and judiciary at Federal, State and Local Government levels; relationship among the three arms of government; principles of “Separation of power” and “Checks and Balance” in government; |



- Independence of Judiciary”
election/appointment and removal of the
government; Code of conduct for Public
officers, accountability of public
functionaries, the mass media as an eye
on government and its performance so
far.
4. Constituted Authority: meaning of constituted authority; types of
constituted authority and their
differences; meaning of bureaucracy, its
characteristics, advantages; forms of
delegated authority in modern state;
distinction between power and authority;
forms and effects of abuse of power and
remedies of power; “leadership” and
“follower ship” and the role of leaders and
followers in nation building; qualities of
good leaders and good followers
 5. National identity: Need for the ways of preserving national
identity; role and significance of national
symbols; contributions of selected heroes
and heroines towards the development of
Nigeria; various culture groups in Nigeria
and the need to preserve Nigeria’s
indigenous cultures; cultural diversity and
national integration/nation building.
 6. National ethics Explanation of the need for national



- and discipline in national life: ethnics; relating to various aspects of national ethics to national development; causes and consequences of indiscipline in the nation; methods used by public agencies in the control of indiscipline; need to maintain the right attitude towards public property.
7. Environmental Protection: Concept of environment; components of the Nigerian environment on human development; ways of reducing over exploitation of the environment; different forms, causes and effects of population in the environment; different methods used for the conservation of the environment; importance and international conservation agencies.
8. Revision: Summary, revision and examination.

Course Approach

1. Instruction in the course shall be by lectures supplemented with tutorials. Assignment and projects shall be given from time to time and shall account for 20 percent of the evaluation of the achievement of the objectives.
2. Regular students' attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study of recommended text books,



reference books, periodicals and other reading materials as may be directed from time to time by the lecture(s).

4. Course valuation shall be by either essay questions or objectives questions or combination of both or semi-essay semi-objectives type questions.

MEASURES FOR CURBING THE OBNOXIOUS WIDOWHOOD PRACTICES

1. Education (2) Constitutional Provisions (3) Publications (4) Churches (5) Cultural Revival

THE NIGERIAN PERCEPTION OF HIS WORLD

Socio-Political environment in Nigeria



State of the Nation

1. Political murders
2. Crisis of Insecurity
3. Political Elections
4. Political Insurrection in the states

INTERNATIONAL TRADE AND ELEMENT OF INCOME ACCOUNTING

- a. Reasons for International Trade
- b. Balance of Payment
- c. Protection in International Trade
- d. National income Accounting

GST 106: USE OF ENGLISH II (2) UNITS

GST 223 is intended to consolidate the competence in the Use of English acquired by students who offered GST 101 and also train the students in the Use of Library. Particularly emphasized in the application of acquired skills to written communication and gaining skills in information acquisition.

Course Objectives

The course shall accomplish the following objectives:

1. Expose students to various writing techniques with a move intensive practice on composition, letter/report writing and essay techniques culminating in the term paper.
2. Train the students in speech practices, literary forms and literary criticism.
3. Expose the students in speech, literary forms and literary criticism.



Course History:

GST 102 is the second segment of the Use of English course prescribed in the 1989 NUC approved minimum academic standards for Nigerian Universities. It is also prescribed as mandatory course in the 1990 NBTE. General Studies course specifications for Polytechnics and similar tertiary institutions.

Course Structure

GST 102 is structured and expected to run as indicated below:

| Unit | Theme | Content |
|-------------|-------------------------|--|
| 1. | General Introduction | Review of previous programme; overview of present course; essay content organization etc. |
| 2. | Argumentative essay: | features of the argument; syllogism, inductive and deductive logic; pitfalls to avoid (e.g. fallacy of premise, middle term and conclusive, over-generalisation etc); organizing the essay in four paragraphs (introduction, reputation of opposing views, presentation of main points, conclusion); examples of argumentative essays; possible essay. |
| 3. | Descriptive essay: | To be viewed as scientific writing, use (e.g. to give objective accounts, difficulties (e. g choice of appropriate vocabulary etc), organization of paragraphs each with a theme paragraph unit. |



4. Expository essay: Purpose (explanation of concepts), uses for abstract and philosophical writing organization emphasizing them and unit or logic.
5. Report essay: Writing minutes of meetings and reports practice in reported speech and passive voice coding or numbering of minutes.
6. Language and literature: What is fiction? Literary forms using a least 2 different novels to explain character, plot, theme lesson (if any language forms).
7. Language And literature: Continues as in 6 above as need be.
8. The term paper: Nature and use, choosing a topic; organization, notes and bibliography. Actual term paper based on novels read or other relevant theme.
9. Acquisition of information: Use of library, library services and organization; library stock; catalogue; classification, reference sources.
10. Acquisition of information: Use of reference and index cards, reference and bibliography
11. Speech practice: Differences between phonetic and normal Orthography; practice in difficult phoneiness.
12. Speech Oval delivery and practice; speech writing



- practice: and delivery.
13. Revision: Summary, revision, submission of term paper and exams.

Course Approach

1. Introduction course shall be by lectures supplemented with tutorials. Assignments and projects shall be given from time to time and shall account for 20 percent of the final evaluation of the achievement of the course objectives.
2. Regular students attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study of recommended text books, reference books, periodicals and other reading materials as may be directed from time to time by the lecturer(s).
4. Course valuation shall be by either essay questions or objectives questions or objectives questions or combination of both or semi-essay semi-objective type questions.

| Unit | Theme | Content of Theme |
|-------------|--------------------------|---|
| 1. | General Introduction: | Review of previous programme; overview of present course; essay content organization etc. |
| 2. | Argumentative essay: | Features of the argument; syllogism, inductive and deductive logic; pitfalls to avoid (e. g fallacy of premise, middle term and conclusion, over-generalisation etc); organizing the essay in four paragraphs |



- (introduction, reputation of opposing views presentation of main points, conclusion); examples of argumentative essays; possible essay.
3. Descriptive essay: To be viewed as scientific writing; use (e. g to give objective accounts), difficulties (e. g choice of appropriate vocabulary etc), organisation of paragraphs each with a theme; paragraph unit.
 4. Expository essay: Purpose (explanation of concepts), uses for abstract and philosophical writing organization emphasizing them and unit or logic.
 5. Report writing: Writing minutes of meetings and reports practice in both reported speech and passive voice, coding or numbering of minutes.
 6. Language and literature: What is fictions? Literary forms using at least 2 different novels to explain character, plot, theme lesson (if say language forms).
 7. Language and literature: Continues as in 6 above as need be.
 8. The term paper: Nature and use, choosing a topic;



- organization, notes and bibliography. Actual term paper based on novels read or other relevant theme.
9. Acquisition of information: Use of library, library services and organization, library stock; catalogue; classification, reference sources.
10. Acquisition of information: Use reference and index cards, reference and bibliography.
11. Speech practice: Differences between phonetic and normal orthography; practice in difficult phoniness.
12. Speech practice: Oral delivery and practice; speech writing and delivery.
13. Revision: Summary, revision, submission of term paper and exams.

Course Approach

1. Instruction: a course shall be by lectures supplemented with tutorial. Assignments and projects shall be given from time to time and shall account for 20 percent of the final evaluation of the achievement of the course objectives.
2. Regular students attendance at lectures and tutorials is compulsory. A list of registered students in the course shall be maintained and roll calls carried out from time to time.
3. Students are expected to make their notes during lectures and supplement with private study of recommended text books, reference books, periodicals and other reading materials as may be directed from time to time by the lecture(s).



4. Course valuation shall be by either essay questions or objectives questions or combination of both or semi-essay semi-objectives type questions.

GST 109: HUMANITIES II (2) UNITS

STUDY I

The Relevance of the Humanities in Development By Dr. M.C. Njoku

- Review of Definition Scope and functions of the subject matter “Humanities.
- Archeology and History
- Fine Arts
- Music
- Literature: Drama, Poetry, prose Fiction.

STUDY II

Human Rights and Social Justice: The African perspective by O.Okechukwu Ibeanu.

- Introductio: General meaning of the topic and terms in the topic: Human Right and social justice
- Approachs in definitions of Human Right
 - A. The naturalist Approach
 - B. The positive Approach
 - C. The socialist Marxist Approach

NATIONAL AND INTERNATIONAL RECOGNITION OF HUMAN RIGHT

1. Political and civil rights
2. Economic, social and cultural rights
3. Group rights.



- The Meaning and Content of Social Justice
- The Content of social Justice
- a). Sovereignty of the people
- b). Security and welfare of the people
- c). Popular participation in government
 - The State of Human Rights and Social Justice in Africa.

STUDY III

The contribution of Christianity to the Development of Post-Primary Education in Nigeria 1882 – 1940. By Francis Anyika.

1. The provision of Post-Primary education in Eastern Nigeria – Teacher Training Colleges and Secondary schools.
2. The provision of Post Primary Education in Western Nigeria: Teacher Training College and Secondary Schools
3. The provision of Post- Primary Education Northern Nigeria: Teacher Training Colleges and Secondary School.
4. The role of Post-Primary education in National Development.

STUDY IV

AFRICA AND DEVELOPMENT – The concept of development

- African's present state of development
 - Factors responsible for Africa's underdevelopment
- (1). Slave trade
 - (2). European Imperialism and colonization style
 - (3). Neo-colonialism
 - (4) African way of leadership
 - (5) Ethnicity



WORLD VIEW AND HUMAN DEVELOPMENT

- (i) Concept of a world view
- (ii) African world view and Development

Crisis of values and national Development in African

STUDY V

FAMILY SYSTEM IN AFRICA

- African customary marriage institution
- African legal tradition
- African tradition Religion

STUDY VI

MULTILINGUALISM IN NIGERIA: ITS DYNAMICS IN NATIONAL DEVELOPMENT

- (1) Language and the group instinct
- (2) Patterns of Historical Development of multilingualism
- (3) Multilingualism in Nigeria
- (4) The problem of political integration
- (5) Language policy

GST 208: PEACE AND CONFLICT RESOLUTION (2) UNITS

Violence – Meaning and Types, Structural violence. Terrorism, Violence Against children, some of the consequences of violence.

STUDY II

Conflict – Meaning causes and conflict handling styles. Domination. Avoidance, Accommodation. Collaborating, Compromising, Confrontation/Fighting, Problem – solving. The Methods of conflict resolution and transformation.. Alternative Dispute Resolution. Western Alternative Dispute resolution. Grassroots Community –



Based activities. Good Governance. Communication. Collaboration, negotiation, Conciliation, mediation, Arbitration, Adjudication, Crisis Management, Peace support operations in Africa, Understanding peace support operations, the nature of peace support operations in Africa, A survey of united nations peace support operations in Africa, OAU/AU –Led peace operations.

SECOND SEMESTER YEAR TWO

AGE 201: ENGINEER IN SOCIETY (2) UNIT

Philosophy of Science and Engineering. History of Engineering and Technology, The Engineering profession – engineering literacy professional bodies and engineering societies . Engineers' code of conduct and ethics. Engineers and nation building – economy, politics, business, safety in Engineering and introduction in Risk analysis, invited lecturers from professionals.

CEE 214: COMPUTATIONAL TECHNIQUES FOR ENGINEERS I (2) UNITS

Algorithm development and structured Programming Concepts: flowcharting: pseudo – codes: Sequencings mechanisms and control flow: Stepwise refinement, Debugging and Testing: String processing – Computerization Substring: matching.

Internal Searching and Sorting methods such as binary searching bubble, selection and insertion sorting hash coding. Data structures – Lists, arrays stacks, and queens. Curve plotting for polynomial and frigonometric functions. Computer – based solution of matrix equation, computerization – of numerical techniques in mathematics.



CHE 221: THERMODYNAMICS (2) UNITS

Basic concepts of thermodynamics: The zeroth Law: Intensive and extensive properties: calibration processes: The first law in closed systems, in flow processes with applications: properties of the working fluids, liquids, vapours and gases. The P-T data of the pure water substance at boiling: the perfect gas, the ideal gas and P – V – T relation: the second law of thermodynamics: change in isolated systems: consequences of second law in energy conversion

CVE 213: STRENGTH OF MATERIALS (2) UNITS

Triaxial and combined stresses- normal and shear: plastic behaviour of materials, Failure theories and criteria: Stresses in thin- and thick-walled pressure vessels, riveted and welded joints. Shearing and bending of beams-shear and bending moment diagram, suit-up beams and bimetal beams, reinforced concrete beams: Non-round cross-section beams, curved beams, hollow beams with thin-walled sections.

EEE 212: APPLIED ELECTRICITY II (2) UNITS

Linear I.C op –amp, linear and non-linear operations, logarithmic amplifiers, A/D and D/A converters, gyrators and negative importance converters, the 555 timer structure and applications, four – quadrant multipliers, dynamic logic systems and RAM memory circuits, application of digital circuits to instrumentation.

FEG 204: ENGINEERING ANALYSIS IV (2) UNITS



Vector analysis: The Jel operations: Line and green Theorms: Gans – theorem: Numerical differentiation and integration: Derivatives of complex variable Conchy- Riemann equation: Singular points: Residue theorem: Conformal mapping the bilinear transformation: Contour Integration: Taylor and Laurent expansion.

MEC 212: ENGINEERING DRAWING I (2) UNITS

Drawing instruments and equipment: Letting: Bisection of lines and angles: Construction of triangles, rectangles and squares circles tangency problems: Construction of polygons, ellipse, parabola, hyperbola, cycloid, involutes, etc. Orthographic projection (1st and 3rd) angle using simple objects.

MEC 252: WORKSHOP PROCESSES AND PRACTICE II (2) UNITS

Welding and brazing, AC and Dc electric arc welding; Fitting and assembling of electrical skills; Testing of electrical installation and circuits; Tools and machines for wood works; Carpentry and joinery; preparation and preservation of wood; Brickwork and masonry; Bonding; Pluming etc.

FIRST SEMESTER YEAR THREE

ENGINEERING MATHEMATICS V (2) UNITS

Numerical analysis and its application to engineering problems, operational methods, transform, series and special functions in engineering.



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MEC 341: ENGINEERING MECHANICS I (2) UNITS

Formulation of Dynamical problems, Newtonian principles: Kinematic of particles: Newton's second law: Equation of motions, Kinetic energy, potential energy impulse and momentum principles, conservation of momentum: Application to impact, vibrations etc. systems of particles.

MEC 461: THERMODYNAMICS (2) UNITS

Basic concepts of thermodynamics: The zeroth Law: Intensive and extensive properties: calibration processes: The first law in closed systems, in flow processes with applications: properties of the working fluids, liquids, vapours and gases. The P-T data of the pure water substance at boiling: the perfect gas, the ideal gas and P – V – T relation: the second law of thermodynamics: change in isolated systems: consequences of second law in energy conversion.



MEC 371: FLUID MECHANICS II (2) UNIT

Introduction to incompressible flows: Hydrostatics momentum equation. Differentiate equation of motion for Invisci.

MEC 321: MECHANICAL ENGINEERING DESIGN I (3) UNITS

Torsional; Keys, splines shrink fits, Linear; power screws, friction of screws and stress concentration. Bolts and nuts, studs, Optimum tightening. Bolt groups, Pilgram nuts; Permanent; Rivets welds, adhesives

EEE 313: CIRCUIT THEORY (2) UNITS

Circuit elements, sources, circuit theories, and applications. Network response to steps, ramp, impulses, Network functions, response to exponential, sinusoidal sources. Laplace transforms, polezero analysis, network synthesis, resonance, two-point analysis, ladder network. Star-Delta transformation, T,P Networks.

MEC 331: STRENGTH OF MATERIALS (2) UNITS

Triaxial and combined stresses-normal and shear: plastic behaviour of materials, failure theories and criteria: stresses in thin – and thick – walled pressure vessels, riveted and welded joints: shearing and bending of beams – shear and bending moment diagram, suit – up beams and bimetal beams, reinforced concrete beams, Non-round, cross – section beams, curved beams, hollow beams with thin-walled sections.

SECOND SEMESTER YEAR THREE



FEG 306: ENGINEERING MATHEMATICS VI (2) UNITS

Mathematical modeling of physical systems, numerical techniques, boundary value problems, Fourier integral, Fourier series, orthogonal functions, and Sturm-Liouville systems, partial differential equations including theory, classification and solution by various methods.

MEC 342: ENGINEERING MECHANICS II (2) UNITS

Plane Kinematics of rigid bodies: Absolute and relative motion including instantaneous center of zero velocity: Relating axes motion
General equation of motion: translation, Rotation and General plan motion: work – Energy relations virtual work impulse and momentum:
Three dimensional dynamics of rigid bodies, Angular momentum, Tyroscopic motion.

MEC 344: THEORY OF MACHINES (2) UNITS

Velocity and acceleration machine element using both analytical and graphical approaches with particular reference to the slider – cranks, mechanism and the quick – return mechanism, instantaneous center methods forces to accelerate machine elements: balancing of rotating masses in common transverse planes: balancing return breaks and dynameters.

MEC 354: MANUFACTURING TECHNOLOGY I (2) UNITS

Introduction to workshop practice. Use of hand tools and Engineering approach to design.

MEC 313: ENGINEERING DRAWING III (2) UNITS



Further work on Loci – epicycloids. Hypocycloid, points interest on mechanisms screw threads and fastenings. Project of lines, plane areas and solids on auxiliary planes: Further work on engineering components, Development of surfaces – triangulation: Assembly drawings: freehand sketching of engineering components and assemblies in orthographic and pictorial projection.

MME 341: MECHANICAL METHALLURGY (2) UNITS

Manufacturing process of pig iron, wrought iron, cost iron carbon and alloy steels. Heat – treatment of steels, hardening. Low-alloy, high strength, heat-resistant and tool steels, deep drawing steels, stainless steels, surface treatments, structure and properties of cost iron.

MEC 332: STRENGHT OF MATERIALS III (2) UNITS

Statically indeterminate beams, theorem of three moments, theorem of castigliance and its application to statically indeterminate beams limit analysis: columns: Euler's column formula. Secant and Empirical formulae: Tensile, Compressive and Impact Test, fracture and Fatigue of metals effects of high temperature, corrosion, coatings etc. on metals

EEE 326: ELECTRONICS DEVICES AND CIRCUITS (2) UNITS

Field effect transistor, transistor as voltage switch, basic switching circuits, mono-stable and bistable multivibrator circuits, binary divider (Eccles – Jones circuit). Schmitt trigger, a stable multivibrator, current switching FET as a gate choppers, phase sensitive detection.



MEC 399: MECHANICAL ENGINEERING LAB. (2) UNITS

The objective of this course is to ensure that the students possess laboratory experiments in different areas of Mechanical (a) Fluid flow-discharge over weirs impact of a jet of orifice, flow through a venture, friction loss in a pipe etc (b) of vibration and tension.

EEE 372: MEASUREMENT AND INSTRUMENTATION (2) UNITS

Fundamental concepts, definitions in metrology, Theory of errors, indicating instruments moving coil, iron devices, I.V, Kwl, P.F. instruments. Dynamometer. Frequency measurement. Digital, bridges analog electronic measuring instruments. Cathodes Ray oscilloscope. Transducer, Gauges, recorders.

FIRST SEMESTER YEAR FOUR

FEG 407: ENTREPRENEURSHIP STUDY (1) UNIT

MEC 445: MECHANICS OF MACHINES (2) UNITS

Force and motion relationship in constrained mechanics analysis of com, gear, linkage, belt drive and chain drive systems for motion and power transmission vehicle mechanics, brake and clutch systems.

MEC 461: ENGINEERING THERMODYNAMICS III (2) UNITS

Carnot cycle: Thermodynamic cycle; The steam power plant, Refrigeration and air conditioning cycles, Liquefaction processes; Thermodynamic approach to fluid mechanics, thermodynamic of flow



processes. Conservation of mass and energy. The sonic velocity, metering and throttling processes, nozzles, compressor, ejectors.

MEC 475: FLUID MECHANANICS II (2) UNITS

Introduction to incompressible flows; Hydrostatics; mass conservation equation; differential equations of motion for inviscid flows; Bernouli's equation; Linear and angular momentum theorems and applications to engineering problems. Equations governing viscous flow and some special solutions; Dimensional analysis and modeling with application to flow problems; Boundary layers and separation; Drag and lift.

MEC 447: MECHANICAL VIBRATION (2) UNITS

Free and forced oscillation of lumped mass-spring systems with and without damping. Single and multi-degrees of freedom. Natural frequencies, modes of vibration, resonance.

MEC 443: SYSTEM ANALYSIS (2) UNITS

MEC 421: MECHANICAL ENGINEERING DESIGN II (2) UNITS

Flexibility: springs and vibration dampers

MEC 453: ENGINEERING METALLURGY (2) UNITS

Manufacturing process of pig iron, wrought iron, cast iron carbon and alloy steels. Heat – treatment of steels, hardening. Low-alloy, high strength, heat-resistant and tool steels, deep drawing steels, stainless steels, surface treatments, structure and properties of cast iron.



**MEC 441: COMPUTATIONAL METHODS IN ENGINEERING (2)
UNITS**

Review of structured programming concept; String processing; Searching; Sorting; Data structure in Pascal programming Language; matrix computation; Numerical computation programs using examples in mathematics and engineering introduction to Object-Oriented programming – Visual Basic; introductory mathematical and engineering systems implementation.

**MEC 499: MECHANICAL ENGINEERING LAB. PRATICAL II (3)
UNITS**

The objective of this course is to ensure that students participate in basic laboratory experiments in different areas of Mechanical Engineering e.g. (a) Fluid flow-discharge over weirs. Import of a jet, discharge through orifice, flow through a venture, friction loss in a pipe etc (b) measurements of vibration and tension.



MEC 463: HEAT AND MASS TRANSFER I (2) UNITS

Introducing heat transfer principles and applications in chemical industries, forced and natural convections, steady-state conduction, radiation, boiling and condensation, boilers and heat exchangers.

SECOND SEMESTER YEAR FOUR

INDUSTRIAL ATTACHMENT (6) UNITS

Is on the job experience in industry chosen for its relevance to Student's major weeks during the long vacation following 300 levels.

FEG 407: ENTREPRENURSHIP STUDY

FIRST SEMESTER YEAR FIVE

MEC 565: APPLIED THERMODYNAMICS (2) UNITS

Thermodynamics of gases, vapours, and reactive and non-reactive mixtures, process relations, concepts, concepts of equilibrium, reversibility and irreversibility.

MEC 575: FLUID MECHANICS III (2) UNITS

Introduction to incompressible flows; Hydrostatics; Mass conservation equation; Differential equations of motion for inviscid flows; Bernoulli's equations; Linear and angular momentum theorems and occupational to engineering problems. Equations governing viscous flow and some special solutions; Dimensional analysis and modeling with application to flow problems; Boundary layers and separation; Drag and lift.



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MEC 543: CONTROL SYSTEM (2) UNITS

Closed loop control, Electrical servo mechanisms and process control, Linear systems. Transfer functions. Frequency response, phase systems, stability analysis and criteria. Compensation techniques analysis, Computer techniques of simulation of linear control system.

MEC 523: MECHANICAL ENGINEERING DESIGN (2) UNITS

MEC 557: ENGINEERING MATERIAL SELECTION (2) UNITS

Introduction to electronic configuration, atomic structures, interatomic bonding mechanisms, crystal and microstructure. Relationship between structure and properties of metals, alloys, ceramics, and plastics. Principles of the behaviour of materials in common environment, Fabrication processes and application.

MEC 583: LAW AND MANAGEMENT (2) UNITS

MEC 581: INDUSTRIAL ENGINEERING (ECONOMICS STATISTICS) (2) UNITS

Work study, payment systems, job evaluation, production planning and control. Resource allocation, inventory control, ordering, motion study.

SEMINAR (3) UNITS

In the seminar presentation a topic on mechanical Engineering is signed to a student. A student is expected to prepare to the seminar and present it each in the classroom while the lecturer examines both the written work and the presentation of the seminarian (students)



SECOND SEMESTER YEAR FIVE

MEC 524: MECHANICAL ENGINEERING DESIGN III (2) UNITS

MEC 566: HEAT AND MASS TRANSFER II (2) UNITS

Introducing heat transfer principles and applications in chemical industries, forced and natural convections, steady-state conduction, radiation, boiling and condensation, boilers and heat exchangers.

MEC 564: ENERGY CONVERSION SYSTEMS (2) UNITS

Primary and secondary types of energy and their interconvertibility physical chemical, MHD, wind, geothermal, thermo mechanical nuclear biomass etc. Principle fuels for energy conversion. Direct and indirect conversion of primary energy. Power station economics power load estimation and forecasting.

MEC 556: MANUFACTURING TECHNOLOGY II (2) UNITS

Introduction to workshop practice. Use of hand tools and Engineering approach to design.

MEC 554: ECONOMICS & OPERATIONAL RESEARCH (2) UNITS

MEC 528: ADVANCED METHODS IN DESIGN (2) UNITS

MEC 568: REFRIGERATION & AIR-CONDITIONING (2) UNITS

Application of the thermodynamics theory and design principles to conform cooling food refrigeration and cryogenic systems. Haracteristics of refrigeration control systems. Economic aspects and optimization criteria.

MEC 599: PROJECT (6) UNITS



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Students are required to carry out a research/investigation type of project of relevance to civil engineering practice in Nigeria. The project is concluded in a formal thesis submitted and defended before an external examiner.