School of Mechanical Engineering

11. Components of the programme:

(a) Core courses (auto, plant and production options)

- Mathematics 1, 2, 3, and 4
- Engineering drawing 1 and 2
- Strength of materials 1 and 2
- Mechanics of machines 1, 2, 3, and 4
- Thermodynamics 1and 2
- Mechanics of fluids 1 and 2
- Workshop process and practice 1 and 2
- Communication skills 1 and 2
- Computer literacy 1 and 2
- African studies

(b) Elective courses (production option)

- Manufacturing technology 1, 2, 3and 4.

- Metrology
- Instrumentation and measurement
- Basic electronics
- Installation and maintenance
- Jigs and tool design 1 and 2
- Production planning and control
- Quality control 1 and 2
- Instrumentation and control 1 and 2
- Management and organization 1 and 2

Elective courses (plant option)

- Fluid mechanics 3
- Plant maintenance and workshop services 1, 2, 3, and 4
- Manufacturing processes
- Instrumentation and measurements
- Electrical power and distribution
- Basic electronics

- Internal combustion engines
- Heat transfer
- Control systems
- Management and organization 1 and 2
- Refrigeration and air condition
- Alternate energy sources\

Elective courses (auto option)

- Mechanics of fluids 3
- Vehicle technology 1 and 2
- Internal combustion engines 1 and 2
- Automobile electrical systems
- Automobile maintenance and repairs
- Fuels, oils, and lubricants
- Vehicle engine science and calculations
- Workshop organization and administration 1 and 2
- Management and control of transport

- Law of business and carriage 1 and 2
- Energy and environmental studies
- Automobile workshop practice 1 and 2
- Automobile electronics
- Management principles
- Automobile heating and air condition

(c) Mandatory courses (production engineering, plant engineering, automobile engineering v option)

- Machine design 1 and 2
- Computer aided design
- Mechanical engineering lab 1 and 2
- Industrial attachment 1 and 2
- Electrical engineering
- Materials technology
- Project work 1 and 2
- Research methods

(d) Research component;

Student's project work 1 and 2

(e) No competence-Based Training (CBT) component.

(f)

(g) Industrial attachment, internship, and practical training reports and assessment forms.

(h) The structure of the programme in semester-by-semester schedule/structure of course, showing the credit value of each course is as follow;

DEPARTMENT **- Plant Engineering**

-Production Engineering

-Automobile Engineering

PRODUCTION ENGINEERING

YEAR ONE

SEMESTER 1

COURSE TITLE	CODE	T	T/P	C
Mathematics I	MATH 111	2	1/0	2
Engineering Drawing I	MCE 151	1	0/4	2
Strength of Materials I	MCE 141	2	1/1	2
Mechanic of Machines I	MCE 131	3	1/1	2
Thermodynamics I	MCE 121	3	1/1	2
Mechanics of Fluids I	MCE 143	3	1/1	2
Workshop Processes and Practice I	MCE161	2	1/3	3
Communication Skills I	COS 101	2	0/0	2
Computer Literacy I	CLT 101	1	0/4	2
TOTAL		**19**	**21**	**19**

SEMESTER 2

COURSE TITLE	CODE	T	T/P	C
Mathematics II	MATH 112	2	1/0	2
Engineering Drawing II	MCE`152	1	0/4	2
Strength of Materials II	MCE 142	2	1/1	2
Mechanics of Machines II	MCE`132	3	1/1	2
Thermodynamics II	MCE122	3	1/1	2
Mechanics of Fluids II	MCE 144	3	1/1	2
Workshop Processes and Practice II	MCE 162	2	1/3	3
Communications Skills II	COS 102	2	0/0	2
Computer Literacy II	CLT 102	1	0/4	2
Africa Studies	AFS 102	2	0/0	2
TOTAL		**21**	**21**	**21**

YEAR TWO

SEMESTER 3

COURSE TITLE	CODET	T	T/P	C
Mathematics III	MATH 211	2	1/0	2
Mechanics of Machines III	MCE 233	3	1/1	2
Machine Design I	MCE 213	2	1/1	2
Manufacturing Technology I	MCE 263	2	1/3	3
Metrology	MCE 265	2	1/0	2
Computer Aided Design	MCE 215	2	0/2	2
Mechanical Engineering Lab. I	MCE 201	1	0/4	2
Industrial Attachment I	INA 201	0	0/2	1
Electrical Engineering	EEE 233	2	1/1	3

TOTAL		**16**	**20**	**19**

SEMESTER 4

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Mathematics IV	MATH 212	2	1/0	2
Mechanics of Machines IV	MCE 234	2	1/1	2
Machine Design II	MCE 214	2	1/1	2
Materials Technology	MCE 294	2	1/0	2
Manufacturing Technology II	MCE 264	2	1/3	3
Instrumentation and Measurement	MCE 236	2	1/0	2
Mechanical Engineering Lab. II	MCE 202	1	0/4	2
Installation and Maintenance	MCE 274	2	1/1	3
Basic Electronics	EEE234	2	1/1	3

TOTAL		**17**	**18**	**21**

YEAR THREE

SEMESTER 5

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Manufacturing Technology III	MCE 365	2	1/1	3
Jig and Tools Design I	MCE 315	2	1/1	2
Production Planning and Control	MCE 375	3	1/0	3
Quality Control I	MCE 377	2	1/1	3
Instrumentation and Control II	MCE 335	2	0/4	3
Project Work II	MCE 301	0	0/0	1
Industrial Attachment II	INA 301	0	0/0	1
Management and Organization I	SMS 305	2	0/0	2

Research Methods	SME 311	2	0/0	2
TOTAL		**15**	**11**	**19**

SEMESTER 6

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Manufacturing Technology IV	MCE 366	2	1/1	3
Jig and Tool Design II	MCE 316	2	1/1	2
Quality Control II	MCE 378	2	1/0	2
Instrumentation and Control II	MCE 336	2	1/1	3
Project Work II	MCE 302	2	0/4	3
Management and Organization II	SMS 306	2	0/0	2
Management A/C and Finance	ACT 306	3	0/0	3
Entrepreneurship	ETP 346	2	0/0	2

TOTAL		**17**	**11**	**20**

PLANT ENGINEERING

YEAR ONE

SEMESTER 1

COURSE TITLE	CODE	T	T/P	C
Mathematics I	MATH 111	2	1/0	2
Engineering Drawing I	MCE 151	1	0/4	2
Strength of Materials I	MCE 141	2	1/1	2
Mechanic of Machines I	MCE 131	3	1/1	2
Thermodynamics I	MCE 121	3	1/1	2
Mechanics of Fluids I	MCE 143	3	1/1	2
Workshop Processes and Practice I	MCE161	2	1/3	3

Communication Skills I	COS 101	2	0/0	2
Computer Literacy I	CLT 101	1	0/4	2
TOTAL		**19**	**21**	**19**

SEMESTER 2

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Mathematics II	MATH 112	2	1/0	2
Engineering Drawing II	MCE`152	1	0/4	2
Strength of Materials II	MCE 142	2	1/1	2
Mechanics of Machines II	MCE`132	3	1/1	2
Thermodynamics II	MCE122	3	1/1	2
Mechanics of Fluids II	MCE 144	3	1/1	2
Workshop Processes and Practice II	MCE 162	2	1/3	3
Communications Skills II	COS 102	2	0/0	2

Computer Literacy II	CLT 102	1	0/4	2
Africa Studies	AFS 102	2	0/0	2
TOTAL		**21**	**21**	**21**

YEAR TWO

SEMESTER 3

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Mathematics III	MATH 211	2	1/0	2
Mechanics of Machines III	MCE 233	3	1/1	2
Mechanics of Fluids III	MCE 245	2	1/1	2
Machine Design I	MCE 213	2	1/1	2
Plant Maint. Wks. Services I	MCE 275	2	1/3	3
Computer Aided Design	MCE 215	2	0/2	2
Mechanical Engineering Lab. I	MCE 201	1	0/4	2

Industrial Attachment I	INA 201	0	0/2	1
Electrical Engineering	EEE 233	2	1/1	3
Manufacturing Processes	MCE 267	2	2	2
TOTAL		**17**	**16**	**21**

SEMESTER 4

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Mathematics IV	MATH 212	2	1/0	2
Mechanics of Machines IV	MCE 234	2	1/1	2
Machine Design II	MCE 214	2	1/1	2
Plant Maint. Wks. Services II	MCE 276	2	1/3	2
Materials Technology	MCE 294	2	1/0	2
Instrumentation and Measurement	MCE 236	2	1/0	2

Mechanical Engineering Lab. II	MCE 202	1	0/4	2
Electrical Power and Distribution	EEE 236	2	1/1	3
Basic Electronics	EEE234	2	1/1	3
TOTAL		**17**	**19**	**20**

YEAR THREE

SEMESTER 5

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Plant Maint. and Wks. Serv. III	MCE 375	2	1/3	3
Internal Combustion Engines	MCE 325	2	1/1	3
Heat Transfer	MCE 323	2	1/0	2
Control Systems	MCE 337	2	1/0	2
Project Work	MCE 301	0	1/1	1
Industrial Attachment II	INA 301	0	1/1	1

Management and Organization I	SMS 305	2	0/0	2
Research Methods	SME 325	2	0/0	2
TOTAL		**12**	**12**	**16**

SEMESTER 6

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Plant Maint. and Wks. Serv. IV	MCE 376	2	1/3	3
Refrigeration and Air Cond.	MCE 326	2	1/1	3
Alternate Energy Sources	MCE 324	2	1/0	2
Project Work II	MCE 302	2	0/4	3
Management and Organization II	SMS 306	0	0/0	
Management A/C and Finance	ACT 306	3	0/0	3
Entrepreneurship	ETP 346	2	0/0	2

TOTAL	**15**	**11**	**18**

AUTOMOBILE ENGINEERING

YEAR ONE

SEMESTER 1

COURSE TITLE	CODE	T	T/P	C
Mathematics I	MATH 111	2	1/0	2
Engineering Drawing I	MCE 151	1	0/4	2
Strength of Materials I	MCE 141	2	1/1	2
Mechanic of Machines I	MCE 131	3	1/1	2
Thermodynamics I	MCE 121	3	1/1	2
Mechanics of Fluids I	MCE 143	3	1/1	2
Workshop Processes and Practice I	MCE161	2	1/3	3

Communication Skills I	COS 101	2	0/0	2
Computer Literacy I	CLT 101	1	0/4	2
TOTAL		**19**	**21**	**19**

SEMESTER 2

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Mathematics II	MATH 112	2	1/0	2
Engineering Drawing II	MCE`152	1	0/4	2
Strength of Materials II	MCE 142	2	1/1	2
Mechanics of Machines II	MCE`132	3	1/1	2
Thermodynamics II	MCE122	3	1/1	2
Mechanics of Fluids II	MCE 144	3	1/1	2
Workshop Processes and Practice II	MCE 162	2	1/3	3
Communications Skills II	COS 102	2	0/0	2

Computer Literacy II	CLT 102	1	0/4	2
Africa Studies	AFS 102	2	0/0	2
TOTAL		**21**	**21**	**21**

YEAR TWO

SEMESTER 3

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Mathematics III	MATH 211	2	1/0	2
Mechanics of Machines III	MCE 233	3	1/1	2
Mechanics of Fluids III	MCE 245	2	1/1	2
Machine Design I	MCE 213	2	1/1	2
Vehicle Technology I	MCE 283	2	1/0	2
Internal Combustion Engines I	MCE 225	2	1/0	2

Computer Aided Design	MCE 215	2	0/2	2
Mechanical Engineering Lab. I	MCE 201	1	0/4	2
Industrial Attachment I	INA 201	0	0/2	1
Electrical Engineering	EEE 233	2	1/1	3
TOTAL		**18**	**18**	**20**

SEMESTER 4

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Mathematics IV	MATH 212	2	1/0	2
Mechanics of Machines IV	MCE 234	2	1/1	2
Vehicle Technology II	MCE 284	2	1/0	2
Internal Combustion Engines II	MCE 226	2	1/0	2
Automobile Electrical Systems	MCE 282	2	1/0	2
Materials Technology	MCE 294	2	1/0	2

Automobile Maint. and Repair	MCE 288	2	1/0	2
Fuels, Oils and Lubricants I	MCE 286	2	1/0	2
Vehicle Eng. Sc. and Calculation	MCE 216	2	1/0	2
Mechanical Eng. Lab. II	MCE 202	1	0/4	2
TOTAL		**19**	**14**	**20**

YEAR THREE

SEMESTER 5

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Workshop Org. and Admin. I	MCE 387	2	1/0	2
Man. And Control of Transport	MCE 389	2	1/0	2
Law of Business and Carriage I	MCE 385	2	1/0	2
Energy and Environ. Studies	MCE 327	2	1/0	2
Automobile Workshop Practices I	MCE 383	0	0/6	2

Project Work	MCE 301	0	1/1	1
Automobile Electronics	MCE 381	2	1/1	3
Industrial Attachment II	INA 301	0	1/1	1
Research Methods	SME 325	2	0/0	2
TOTAL		**12**	**16**	**17**

SEMESTER 6

COURSE TITLE	**CODE**	**T**	**T/P**	**C**
Workshop Org. and Admin. II	MCE 388	2	1/0	2
Management Principles	MCE 374	2	1/0	2
Law of Business and Carriage II	MCE386	2	1/0	2
Automobile Heating and Air Cond.	MCE 328	2	1/1	3
Automobile Workshop Practice II	MCE 384	0	0/6	2
Project Work II	MCE 302	2	0/4	3

Management A/C and Finance	ACT 306	3	0/0	3
Entrepreneurship	ETP 346	2	0/0	2
TOTAL		**15**	**15**	**19**

NB: T – Theory

T/P – Tutorial and Practical Works

C – Credit

12. Below are the course descriptions including the objectives, contents and reading materials.

HND MECHANICAL ENGINEERING YEAR ONE

Course Code: MCE 141/142

Course Name: Strength of material 1&2

Semester: 1&2

a. Course Objective:

At the end of the module student should:

- Understand the relationships between stress and strain
- Be familiar with the geometrical properties of plane areas
- Be familiar with flexural forces and resultant stresses
- Be familiar with torsional stress and strain
- Know the distribution of bi-axial stress systems
- Be familiar with the concepts of strain energy
- Know the theories of failure

b. Course Content:

- Simple stress and strain
- Moment of inertia
- Flexural forces on beams
- Shear force and bending moment diagram
- Torsional stress and strain

- Bi-axial stress system
- Strain energy
- Theories of failure

c. Recommended reading material:

- Applied strength of material for engineering technology
- The experimental Age of stress of materials by Pro Cedric Turner, 2007

Course Code: MATH111/112

Course name: Engineering mathematics 1&2

Semester: 1&2

a. Course Objective:

By the end of the module the student should be able to:

- Differentiate functions of one or more variables

- Solve first and second order ordinary differential equations
- Manipulate integral calculus
- Understand power series and Fourier series
- Be familiar with hyperbolic functions
- Be familiar with matrix algebra
- Manipulate Laplace transforms

b. Course Content:

- Complex numbers
- Differential calculus
- Integral calculus
- Power series
- Laplace transforms
- Fourier series
- Matrix Algebra
- Hyperbolic functions

c. Reading materials:

- Handout
- Text book: Stroud KA, Engineering Mathematics, 5th Edition

Course code: MCE 143/144

Course name: Mechanics of fluid I&II

Semester: 1&2

a. Course Objective:

By the end of the module the students should be able to:

- Explain the working principles of some fluid measurement devices
- Apply mass energy balances (Bernoulli's Equation)
- Perform simple internal and external forces balances
- Determine velocity profiles based on shell momentum balances.

- Explain basics fluid flow concepts such as pressure, velocity, friction, flow regimes.

b. Course Content:

- Introductory concepts of fluids units & dimensions, hydrostatics
- Flow, flow regimes, conservation of mass & energy, Bernoulli's Equation, flow measurement
- Conservation of momentum, force-momentum balances, forces on pipework, friction in pipe flows, friction factor, the moody chart, rating & design of pipelines, mass
- Laminar flow, newton's of viscosity, Hagen-Poiseille equation
- Pumps: types, selection, characteristics curves

c. Reading Material:

- Handouts
- B.R. Munson, D.F .Young, T.H. Okishi 4th Ed. 2002, Wiley
- Coulson JM & Richardson JF, chemical Engineering volume 1, 6th Ed. Butterworth Heinemann, 1999, Joule Library

Couse Code: MCE 121/122

Course name: Thermodynamic I&II

Semester: 1&2

a. **Course Objective:**

By the end of the module the student should:

- Have fundamental understanding of the basics of the science of energy conversion and prepare them to evaluate merits of different thermodynamics systems.
- Energy conserved based on the first law of thermodynamics.
- Know whether or not a process is possible based on the second law of thermodynamics
- Be able to apply thermodynamics analysis to system or a control volume.
- Course Content:
- Definitions, terminology, properties of systems, pressure, temperature scale, heat and work as path dependent functions
- The first law of thermodynamics and its application to systems
- Application of the first law to control volume: energy relationship for flow processes
- Cycle of heat engines, different kinds of processes, thermal efficiency of heat engines

- The second law of thermodynamics, corcllaries of second law of thermodynamics, reversible processes and irreversible processes
- Isothermal efficiency
- Entropy and entropy production
- Perfect gases
- Heat transfer: conduction, conversion and radiation
- Properties of a pure compressible substance, phases and their transitions, p-v-t relation for gaseous medium, specific heats

b. Reading material:

Handout

Text book: Thermodynamics-An Engineering Approach, by Cengel& Boles, 7th Ed, McGraw Hill, 2011.

Course Code: MCE 151

Course name: Engineering Drawing I&II

Semester: I&II

a. Learning Objective:

By the end of the module the student should be able:

- To increase the ability to communicate with people through graphic drawing
- Learn to sketch and take field dimensions.
- To take data and transform it into graph drawings
- To learning basic engineering drawing formats
- To draw orthographic projections and sections
- Well prepared for future Engineering positions

b. Course content:

- Basic plane geometry
- Design layout drawing, detail drawing & assembly drawing
- Drawing equipment
- Conversion representation of common features
- Isometric projection, oblique projection, & orthographic projection

- Sectional views

c. Learning materials:

Handout

Course Code: MCE 161/162

Course name: Workshop processes and practice 1 and 2

Semester: 1& 2

a. Learning objectives:

By the end of the module, the students should;

- Be familiar with industrial and workshop safeties.
- Know how to use measuring and inspection tools and basic marking out tools.
- Be familiar with holding, supporting devices, cutting and striking tools.
- Know the working principles of machine tools.
- Understand the concept of first aid.

- Be familiar with metrology techniques and measurements.
- Be able to design simple jigs and fixtures.

b. Course content:

- Industrial and workshop safety.
- Measuring and inspection tools.
- Basic marking out tools.
- Holding and supporting devices, cutting and striking tools.
- Introductory to first aid.
- Machine tools such as lathe, milling shaping, grinding and drilling machines.
- Metrology techniques and measurements.
- Machine tool processes.
- Jigs and fixtures.
- Casting.

c. Reading materials:

- Handouts
- Library

Course Code: 101/102

Course name: communication skills

Semester: 1 & 2

a. Learning Objective:

By the end of the module, the student should;

- Be able to identify and state arguments
- Be able to identify the main point in a passage or essay and state the reasons that support a given choice
- Write an essay that comes to well conclusions and solutions supported by relevant evidence and tested against relevant criteria and standard
- Be able to prepare a nice or write a nice curriculum vitae
- Be able to develop public speaking skills.

b. Course content:

- Communication
- Note-making and note-taking
- Developing reading skills
- Some uses of punctuations
- Prepositions
- The simple English sentence and patterns
- Subject verb agreement
- Sources of ambiguity
- The good paragraph
- Editing
- Business interview
- Writing curriculum vitae
- The personal statement
- Documentation

c. Learning materials:

- Handout
- Library

Course Code: CLT 101

Course name: Computer literacy 1and 2

Semester: 1&2

a. Learning Objective:

By the end of the module, the students should;

- understand common computing terminology
- understand the basic principle of operation of computer systems
- apply fundamental knowledge about computer applications such as excel and office word
- make use of common application software packages to carry out simple tasks

- understand the basic features of programming languages
- be aware of social issues related to computer applications
- appreciate the advancement brought about by the widespread use of computers in society
- understand data communication and data presentations

b. Course content:

- Computer and computer literacy
- Components of the system unit
- Input and output devices
- Software
- Data communications
- The internet and the world wide web
- Computer security, safety, and privacy
- Introduction to windows 7
- Introduction to Microsoft excel and word and spreadsheet.

c. Learning materials:

- Handouts
- An introductory computer course for beginning English learners. By Amy Hemmert and Tida Sander
- Media Literacy 8 Ed. W. James Potter

Course Code: MCE 131

Course name: mechanics of machines

Semester: 1

a. **Learning Objective:**

At the end of the module, the students should;

- Know or state Newton's laws of motion
- Know how to use vector to represent forces
- Be able to solve basic trigonometry
- Be able to resolve simple forces
- Be familiar with beams

b. Course content:

- Newton’s laws of motion
- Vectors
- Free-body diagrams
- Beams
- Moment of inertia

c. Learning materials:

- Handout
- Library

Course Code: Afs 101

Course name: African studies/housing challenges and homelessness in Africa

Semester: 1

a. Learning Objective: by the end of this module, the students will be able to;

- Understand the global nature of homelessness and housing challenges

- Know the problems, prospects and strategies of housing in Africa
- Know the challenges facing the provision of affordable housing in African cities
- Know the housing finance systems in some African countries such as Ghana, Nigeria, Tanzania, South Africa and others
- Be familiar with the ways of addressing the challenges of housing and job creation in Ghana.

b. Course content:

- An overview and the global nature of homelessness and housing challenges
- Housing in Africa, problems, prospects, and strategies
- Challenges facing the provision of affordable housing in Africa cities
- Housing finance systems in some Africa countries such as Ghana, Nigeria, Tanzania, south and Africa addressing the challenges of housing and job creation in Ghana.

c. Learning materials:

- Handouts
- V. Moss, NHFC, housing market bulletin, volume 1 issue 4(2003)
- Housing in southern Africa, February 2003

- The report on sustainable human settlement development in Nigeria 2002
- The report on impact of the home finance company in Ghana, 2001
- H. Mohammed, 2002, proceedings of the social housing workshop in Ghana

Course Code: Afs 101

Course name: African studies/conflict prevention management studies

Semester: 1

a. **Learning Objective:**

By the end of this module, students should be able to;

- Be crisis managers whether at home, in the church or at the work place and to serve conscientiously and effectively in international field operations like peace and democracy building, election assistance and observation, home rights education and promotion and monitoring
- Promote conflict prevention and peace building activities with individuals and organization working for promotion of peace at any level of society.

b. Course content:

- Why do we study conflict prevention and management
- Conflict definition of concept
- Approaches to the mediation of social conflict at the interpersonal organization and international
- Conflict in historical perspective, organizational and international conflict
- Analyzing conflict – designing and implementing intervention strategies for conflict/dispute resolution, prevention and management
- Role of international bodies in conflict prevention and resolution
- Promoting peace - the way forward
- Study of the mediation process
- Conflict challenges in Africa
- Organizational conflict.

c. Learning materials:

- Harmann C. F. ed. International Crisis: Insight for Behavioral Research, New York, and the Free Press 1972, P. 13 Hughes, A and R. May. 'The politics of success in black Africa' in third world quarterly (iv) 1, 1988.pp. 1-22, 120

Course Code: Afs 101

Course name: African studies/society and culture

Semester: 1

a. Learning Objective: At the end of this module, the students should be able to;

- Know basic information on African cultural issues such as language, people, institutions, beliefs systems and practices
- Know the conceptual appreciation of African culture/cultures
- Cultural practices in different socio-economic contexts
- Examine how cultural forms manifest unequal power relationship within society
- Know Africa's contribution to the world civilization
- Understand the types of family.

b. Course content:

- The concept of culture

- The beginning of human culture
- Major culture areas in Africa
- Culture and the supernatural
- Kingship and decency
- The institution of marriage
- Family
- Cultural change
- Modern history of Africa

c. Learning materials:

- Handouts

Course Code: Afs 101

Course name: African studies/fitness and wellbeing for social in Africa

Semester: 1

a. Learning Objective:

At the end of this module, the students should be able to;

- Acquire basic knowledge of diet, exercise stress management, health and total wellness and their impact in maintaining healthy lifestyle
- Understand the principles of physical fitness
- Be familiar with health risk factors
- Understand the benefits of being fit.

b. Course content:

- Introduction to fitness
- Wellness and healthy lifestyle
- Choosing a fitness activity
- Principles of physical fitness
- Health-risk factors
- Women and exercise
- Stress and stress management

- Benefits of being physically fit
- The skin and age

c. Learning materials:

- Advanced Studies in Physical Education and Ports, by Beashl P. and J. Taylor
- Handouts
- Concepts of physical fitness, by Corbin C. B. Lindsey and Welk G
- Active lifestyle for wellness, by Dubuque Orwa
- Pregnancy and exercise, by Kwawukume E. Y. 2006
- Fitness and wellness for life, by Prentice W. E. 2006
- The 15 minute - A day natural face lift, by Saffon M. J. 1981

YEAR TWO

PRODUCTION OPTION

MATH 211/212-MATHEMATICS

(a) Objectives

- To develop higher level mathematical skills for students in field such as engineering.
- To demonstrate an understanding of theoretical concepts of mathematics.
- To develop competency in mathematical modeling of complex phenomena, solving problem and decision making

(b) Content

- Hyperbolic and inverse hyperbolic functions
- Advance calculus
- Laplace transforms

(c) Learning Materials

- Lecture notes (handout)
- Library
- Internet

MCE 233/234-MECHANICS OF MACHINES

(a) Objective

- To provide students with skills, knowledge required to describe and analyze the effects of forces on the motion of particles, rigid body and vibrating systems in order to predict dynamic behavior as a basis for engineering design.

(b) Content

- Simple harmonic motion
- Free vibration without damping
- Types of roots of the auxiliary equations

(c) Learning Materials

- Lecture notes(handouts)
- Library
- Internet

MCE 213/214-MACHINE DESIGN

(a) Objectives

- To describe the basic principles of operating behind various machine elements.
- To document on optimized design so that it can be understood and implemented by others.

(b) Content

- Engineering materials
- Mechanical testing of materials
- The casting of metals

(c) Learning Materials

- Lecture notes (handout)
- Library
- Internet

MCE 215-COMPUTER AIDED DESIGN

(a) Objective

- After this course, students should be able to use the Auto CAD software to draw machine parts or mechanical components
- Should be able to write computer numerical control programs for producing the designed parts using the CNC machine.
- Should have a basic concept of computer aided manufacturing (CAM) and its importance especially during computer era.

(b) Content

- CNC simulator
- Machines files
- Auto Cad basic tutorials
- CNC editor (programming codes)

(c) Learning Materials

- lecture notes (handouts)
- library
- Internet

EEE 233-ELECTRICAL ENGINEEERING

(a) Objective

- Students should be able to describe the scientific principles that apply to the basic flow of electricity and explain the functions of various materials used as conductivity, semi conducting and insulating devices in the construction of standard electrical electronic circuit.

(b) Content

- DC network theorems and analysis
- Electrical measuring instruments and measurements.
- Electromagnetic induction

(c) Learning Materials

- Library
- Lecture notes (handout)
- Internet

MCE 265-METROLOGY

(a) Objectives

- To help students identify and the use of reference materials to ensure good quality, accurate, traceable measurement results.
- To help students apply dimensional analysis concepts correctly by looking up reference values for units, conversion accurately perform associated mathematics and present final values with the correct units/symbols.

(b) Contents

- Calibrations
- Standards
- SI units
- Legal metrology

(c) Learning Materials

- Lecture notes(handouts)
- Library

- Internet

INA 201-INDUSTRAIL ATTACHMENT

(a) Objectives

- To develop practical skills in the area of specialization.
- To be able to work in a group or team as engineers mostly work in group to achieve a common goal.
- To enable students know the operations of the various mechanical engineering workshops.

(b) Content

- Visitation to industries as apprenticeship
- Trade theory acquired in the industries

(c) Learning Materials

- Visitation to industries
- Attachment at industries

MCE 201/202-MECHANICAL ENGINEERING LABORATORY

(a) Objectives

- To on the provide understanding to study and prepare report constructional details, working principles and operation of the automotive air and hydraulic brakes
- To provide both theoretical and practical understanding in hydrostatic pressure, dead weight calibration etc.
- To provide the student understanding the theoretical and practical knowledge of compound pendulum etc.

(b) Content

- Hydraulic braking system
- Impact of a jet
- Simple pendulum
- Dead weight calibration

(c) Learning Materials

- Various labs
- Internet

MCE 263/264-MANUFACTURING TECHNOLOGY

(a) Objectives

- To demonstrate high-level advanced knowledge and skills in advanced design and manufacturing practice.
- To demonstrate a high level of autonomy, credibility, ethics and responsibility for all personal work outputs in the advanced manufacturing sector.

(b) Content

- Special purpose machine tools
- Integrated quality assurance
- Mechanically integrated transfer lines

(c) Learning Materials

- Lecture notes(hand out)
- Library
- Internet

MCE 294-MATERIALS TECHNOLOGY

(a) Objectives

- To help students know the properties and structure of metals, ceramics, plastics, composites and other substances to create new materials that meet certain new mechanical, electrical and chemical requirements.
- They must also be able select materials for specific products, develop new ways to use existing material and develop new materials.

(b) Content

- Structure of materials
- Corrosion
- Plastics
- Welding

(c) Reading Materials

- Lecture notes(handouts)
- Library
- Internet

EEE 234-BASIC ELECTRONICS

(a) Objectives

- Students should be able to describe the scientific principle that apply to the basic flow of electricity and explain the functions of various materials used as conducting semi-conducting and insulating devices in the construction of standard electrical circuits.
- Identify and describe the applied electronics principles used to develop circuits system used, radio, television, and fiber optic devices

(b) Contents

- Diodes
- Junction
- Atoms
- Bonding

(c)Reading Materials

- Lecture notes(handout)
- Library

- Internet

MCE 236-INSTRUMENTATION AND MEASUREMENT

(a) Objective

- To develop useful instrumentation and laboratory measurement skills.
- To create awareness of capabilities and limitation of measurements and instrumentation in engineering.
- To give students the baseline knowledge of measurements and instrumentation theory and practice in order to support their present and future needs in engineering testing and research.

(c) Content

- Instruments
- Terminology
- Transducers
- The thermistor
- Error

(d) Reading Materials

- Lecture notes(handout)

- Library
- Internet

MCE 274-INSTALLATION AND MAINTENANCE

(a) Objectives

- To help student to know the various stages in trouble shooting machines at the various workshops
- To help students to know the various ways and methods of installing machines at the various workshop and industries.
- To helps students various types of boilers and their functions

(b) Content

- Boilers
- Trouble shooting
- Installation
- Diesel engines

(c) Reading Materials

- Lecture notes(handout)
- Library
- Internet

PLANT OPTION

MATH 211/212-MATHEMATICS

(a) Objectives

- To develop higher level mathematical skills for students in field such as engineering.
- To demonstrate an understanding of theoretical concepts of mathematics.
- To develop competency in mathematical modeling of complex phenomena, solving problem and decision making

(b) Content

- Hyperbolic and inverse hyperbolic functions
- Advance calculus
- Laplace transforms

(c) Learning Materials

- Lecture notes (handout)
- Library

- Internet

MCE 233/234-MECHANICS OF MACHINES

(a) Objective

- To provide students with skills, knowledge required to describe and analyze the effects of forces on the motion of particles, rigid body and vibrating systems in order to predict dynamic behavior as a basis for engineering design.

(b) Content

- Simple harmonic motion
- Free vibration without damping
- Types of roots of the auxiliary equations

(c) Learning Materials

- Lecture notes(handouts)
- Library
- Internet

MCE 213/214-MACHINE DESIGN

(a) Objectives

- To describe the basic principles of operating behind various machine elements.
- To document on optimized design so that it can be understood and implemented by others.

(b) Content

- Engineering materials
- Mechanical testing of materials
- The casting of metals

(c) Learning Materials

- Lecture notes (handout)
- Library
- Internet

MCE 215-COMPUTER AIDED DESIGN

(a) Objective

- After this course, students should be able to use the Auto CAD software to draw machine parts or mechanical components
- Should be able to write computer numerical control programs for producing the designed parts using the CNC machine.
- Should have a basic concept of computer aided manufacturing (CAM) and its importance especially during computer era.

(b) Content

- CNC simulator
- Machines files
- Auto Cad basic tutorials
- CNC editor (programming codes)

(c) Learning Materials

- lecture notes (handouts)
- library
- Internet

EEE 233-ELECTRICAL ENGINEEERING

(a) Objective

- Students should be able to describe the scientific principles that apply to the basic flow of electricity and explain the functions of various materials used as conductivity, semi conducting and insulating devices in the construction of standard electrical electronic circuits.

(b) Content

- DC network theorems and analysis
- Electrical measuring instruments and measurements.
- Electromagnetic induction

(c) Earning Materials

- Library
- Lecture notes (handout)
- Internet

INA 201-INDUSTRAIL ATTACHMENT

(a) Objectives

- To develop practical skills in the area of specialization.

- To be able to work in a group or team as engineers mostly work in group to achieve a common goal.
- To enable students know the operations of the various mechanical engineering workshops.

(b) Content

- Visitation to industries as apprenticeship
- Trade theory acquired in the industries

(c) Learning Materials

- Visitation to industries
- Attachment at industries

MCE 201/202-MECHANICAL ENGINEERING LAB

(a) Objectives

- To on the provide understanding to study and prepare report constructional details, working principles and operation of the automotive air and hydraulic brakes
- To provide both theoretical and practical understanding in hydrostatic pressure, dead weight calibration etc.
- To provide the student understanding the theoretical and practical knowledge of compound pendulum etc.

(b) Content

- Hydraulic braking system
- Impact of a jet
- Simple pendulum
- Dead weight calibration

(c) Learning Materials

- Various labs
- Internet

MCE 245-MECHANICS OF FLUID

(a) Objectives

- To further develop skills in fluid mechanics.
- At the end the student should understand dynamics of fluid flow.
- The students should know the principles of hydraulic machinery, turbines, pumps, fans and compressors.

(b) Contents

- Dynamic of fluid flow
- Principles of hydraulic machinery, turbines, pumps, fans and compressors.
- Laboratory works.

(c) Learning Materials

- Lecture notes(handouts)
- Library
- Internet

MCE 275/276-PLANT MAINTENANCE WORKSHOP SERVICES

(a) Objectives

- To provide student with a step by step or laid down procedure in servicing plant machinery.
- To develop the students to a high competency level in running their workshop and to know how maintenance works are done in plant shops.

(b) Content

- Reliability centered maintenance
- Types of workshop maintenance facilities
- Maintenance cost and budgeting
- Safety and hazards in maintenance
- Value-driven maintenance and maintenance strategies.

(c) Learning Materials

- Lecture notes(handout)
- Library
- Internet

MCE 267-MANUFACTURING PROCESS

(a) Objectives

- To support students with their application of techniques used in manufacturing
- To support students to develop understanding about basic manufacturing concepts and techniques.

- Ensure students understand the need for differing manufacturing system to meet specified requirements.

(b) Content

- Ferrous metals
- Non-ferrous metals
- Machine tools
- Machining center
- Basic manufacturing processes

(c) Reading Materials

- Lecture notes(hand out)
- Library
- Internet

MCE 294-MATERIALS TECHNOLOGY

(a) Objectives

- To help students know the properties and structure of metals, ceramics, plastics, composites and other substances to create new materials that meet certain new mechanical, electrical and chemical requirements.
- They must also be able select materials for specific products, develop new ways to use existing material and develop new materials.

(b) Content

- Structure of materials
- Corrosion
- Plastics
- Welding

(c) Reading Materials

- Lecture notes(handouts)
- Library
- Internet

EEE 236-ELECTRICAL POWER DISTRIBUTION

(a) Objectives

- To provide detailed understanding of power systems that are used in the production of electricity such as steam turbine electricity generation plants, transformers and synchronous machines.
- To know the common faults associated with electricity generation and how to solve them.
- To have a basic knowledge of the distribution network and the overload.

(b) Content

- Power equipment
- Control and protection
- Distribution network and faults
- Electrical safety

(c) Reading Materials

- Lecture notes(handout)
- Library

- Internet

EEE 234-BASIC ELECTRONICS

(a) Objectives

- Students should be able to describe the scientific principle that apply to the basic flow of electricity and explain the functions of various materials used as conducting semi-conducting and insulating devices in the construction of standard electrical circuits.
- Identify and describe the applied electronics principles used to develop circuits system used, radio, television, and fiber optic devices.

(b) Contents

- Diodes
- Junction
- Atoms
- Bonding

(c) Reading Materials

- Lecture notes(handout)
- Library
- Internet

MCE 236-INSTRUMENTATION AND MEASUREMENT

(a) Objective

- To develop useful instrumentation and laboratory measurement skills.
- To create awareness of capabilities and limitation of measurements and instrumentation in engineering.
- To give students the baseline knowledge of measurements and instrumentation theory and practice in order to support their present and future needs in engineering testing and research.

(b) Content

- Instruments
- Terminology
- Transducers
- The thermistor

- Error

(c) Reading Materials

- Lecture notes(handout)
- Library
- Internet

AUTO OPTION

MATH 211-MATHEMATICS

(a) Objectives

- To develop higher level mathematical skills for students in field such as engineering.
- To demonstrate an understanding of theoretical concepts of mathematics.
- To develop competency in mathematical modeling of complex phenomena, solving problem and decision making

(b) Content

- Hyperbolic and inverse hyperbolic functions
- Advance calculus

- Laplace transforms.

(c) Learning Materials

- Lecture notes (handout)
- Library
- Internet

MCE 233-MECHANICS OF MACHINES

(a) Objective

- To provide students with skills, knowledge required to describe and analyze the effects of forces on the motion of particles, rigid body and vibrating systems in order to predict dynamic behavior as a basis for engineering design.

(b) Content

- Simple harmonic motion
- Free vibration without damping
- Types of roots of the auxiliary equations

(c) Learning Materials

- Lecture notes(handouts)
- Library
- Internet

MCE 213-MACHINE DESIGN

(a) Objectives

- To describe the basic principles of operating behind various machine elements.
- To document on optimized design so that it can be understood and implemented by others.

(b) Content

- Engineering materials
- Mechanical testing of materials
- The casting of metals

(c) Learning Materials

- Lecture notes (handout)
- Library
- Internet

MCE 215-COMPUTER AIDED DESIGN

(a) Objective

- After this course, students should be able to use the Auto CAD software to draw machine parts or mechanical components
- Should be able to write computer numerical control programs for producing the designed parts using the CNC machine.
- Should have a basic concept of computer aided manufacturing (CAM) and its importance especially during computer era.

(b) Content

- CNC simulator
- Machines files
- Auto Cad basic tutorials
- CNC editor (programming codes)

(c) Learning Materials

- lecture notes (handouts)
- library
- Internet

INA 201-INDUSTRAIL ATTACHMENT

(a) Objectives

- To develop practical skills in the area of specialization.
- To be able to work in a group or team as engineers mostly work in group to achieve a common goal.
- To enable students know the operations of the various mechanical engineering workshops.

(b) Content

- Visitation to industries as apprenticeship
- Trade theory acquired in the industries

(c) Learning Materials

- Visitation to industries
- Attachment at industries

MCE 201-MECHANICAL ENGINEERING LAB

(a) Objectives

- To on the provide understanding to study and prepare report constructional details, working principles and operation of the automotive air and hydraulic brakes
- To provide both theoretical and practical understanding in hydrostatic pressure, dead weight calibration etc.
- To provide the student understanding the theoretical and practical knowledge of compound pendulum etc.

(b) Content

- Hydraulic braking system
- Impact of a jet
- Simple pendulum
- Dead weight calibration

(c) Learning Materials

- Various labs

- Internet

EEE 233-ELECTRICAL ENGINEEERING

(a) Objective

- Students should be able to describe the scientific principles that apply to the basic flow of electricity and explain the functions of various materials used as conductivity, semi conducting and insulating devices in the construction of standard electrical electronic circuits.

(b) Content

- DC network theorems and analysis
- Electrical measuring instruments and measurements.
- Electromagnetic induction

(c) Reading Materials

- Library
- Lecture notes (handout)
- Internet

MCE 245-MECHANICS OF FLUID

(a) Objectives

- To further develop skills in fluid mechanics.
- At the end the student should understand dynamics of fluid flow.
- The students should know the principles of hydraulic machinery, turbines, pumps, fans and compressors.

(b) Contents

- Dynamic of fluid flow
- Principles of hydraulic machinery, turbines, pumps, fans and compressors.
- Laboratory works.

(c) Learning Materials

- Lecture notes(handouts)
- Library
- Internet

MCE 283-VEHICLE TECHNOLOGY

(a) Objectives

- To help the student to initiates ideas creatively and develop ideas as potential solutions to problems with the use of their knowledge and experience.
- To acquire knowledge and understanding related to the use of automobile technology.
- To achieve both theoretical and practical understanding concerning automobiles.\

(b) Content

- Vehicle structure
- Steering systems
- Road wheels and tires
- Suspension systems

(c) Learning Materials

- Lecture notes(handout)
- Library
- Internet

MCE 255-INTERNAL COMBUSTION ENGINES

(a) Objectives

- To understand the working principles of the internal combustion engine and to explain its principal parts.
- To know engine components parts and to repair, install and dismantle.
- To know the engine component parts and to repair, install and dismantle.

(b) Contents

- Construction of engine component
- Engine operation cycle
- Lubrication systems
- Ignition systems
- Cooling system

- Terms and definition

(c) Learning Materials

- Lecture notes (Hand out)
- Library
- Internet

MCE 294-MATERIALS TECHNOLOGY

(a) Objectives

- To help students know the properties and structure of metals, ceramics, plastics, composites and other substances to create new materials that meet certain new mechanical, electrical and chemical requirements.
- They must also be able select materials for specific products, develop new ways to use existing material and develop new materials.

(b) Content

- Structure of materials
- Corrosion

- Plastics
- Welding

(c) Reading Materials

- Lecture notes(handouts)
- Library
- Internet

YEAR 3

PRODUCTION ENGINEERING OPTION

MCE 375-PRODUCTION PLANNING AND CONTROL

(a) Objectives

- Helps students to know the techniques of forecasting or picturing ahead every step in a long series of separation operation.
- Helps to make adequate arrangement of men, money, materials, machine tools, implement and equipment relating production.

- Helps students to know manufacturing plan and to determine how data is collected and recorded.

(b) Contents

- Forecast
- Capacity
- Product production

(c) Reading Materials

- Library
- Handout

MCE 377/378- QUALITY CONTROL

(a) Objectives

- It helps the students to establish the desired quality standards which are acceptable to the customers.

- To evaluate the methods and process of production and suggest further improvement in their functioning.
- To undertake such steps which are helpful in achieving the desire quality of the production work

(b) **Contents**

- Error
- Benchmarking
- Setting standard
- Control charts

(c) Learning Materials

- Library
- Handout

MCE 335/336 – INSTRUMENTATION AND CONTROL

(a) Objectives

- To explain the components and function of a control loop.

- Sketch the instrumentation control loops on available trainer resources.
- Learning fundamental principles, generalization or theories.
- Learning to apply course material to improve thinking, problem solving and decisions

(b) Contents

- Instruments
- Sensing elements
- Transducer
- Techniques of bonding

(c) Learning Materials

- Library
- Handout

SMS 305/306 MANAGEMENT AND ORGANIZATION

(a) Objectives

- To help set the strategic goals of an organization.
- To help make decisions on how the overall organization will operate.

- To study social organization and organizational leadership.

(b) Contents

- Job design and enrichment
- Motivation
- Handling grievance
- Supervising workers
- Managing total quality

(c) Learning Materials

- Library
- Handout

INA 301-INDUSTRAIL ATTACHMENT

(a) Objectives

- To develop practical skills in the area of specialization.
- To be able to work in a group or team as engineers mostly work in group to achieve a common goal.

- To enable students know the operations of the various mechanical engineering workshops.

(b) Contents

- Visitation to industries as apprenticeship
- Trade theory acquired in the industries

(c) Learning Materials

- Visitation to industries
- Attachment at industries

MCE 365/366-MANUFACTURING TECHNOLOGY

(a) Objectives

- To demonstrate high-level advanced knowledge and skills in advanced design and manufacturing practice.
- To demonstrate a high level of autonomy, credibility, ethics and responsibility for all personal work outputs in the advanced manufacturing sector.

(b) Contents

- Special purpose machine tools
- Integrated quality assurance
- Mechanically integrated transfer lines

(c) Learning Materials

- Lecture notes(hand out)
- Library
- Internet

ACT 306 –MANAGEMENT ACCOUNTING AND FINANCE

(a) Objectives

- To aid the student to have basic understanding in accounting and finance
- To provide a platform for the student on how to keep account
- To obtain proper interpretation of accounting concepts
- To know how to prepare accurate

- To help utilize resources efficiently
- To measure out comes by providing periodic financial statements which help the firm adjust its operations accordingly

(b) Contents

- Financial accounting information system
- Accounting concept, convention ,bases and policies
- Credit/cash buying and selling
- Depreciation of fixed assets
- Distinction between revenue and capital expenditure
- Cost behavior
- Costing methods and techniques
- Standard costing
- Budgeting planning and control
- Marginal or variables costing levels
- The break-even analysis forms of business entities
- Sources of capital

(c) Learning Materials

- Handout
- Financial accounting :Saylor foundation
- Library

ETP 346 –ENTREPRENEURSHIP

(a) Objectives

- To identify and train potential student entrepreneurs in the field of mechanical engineering
- To impact information about the process, rules, procedure and regulations for setting up a new projects
- To assist the student to obtain knowledge and information about the source of help, incentives and subsidies available from government to set up the project
- To develop small and medium enterprises generation for the students
- To use the entrepreneurial mindset and behave responsibly and ethically in their roles as entrepreneurs
- To creatively analyses business environment, opportunity recognition and business plan ideas generation process

(b) **Contents**

- Nature and development of entrepreneurship

- Characteristic of successful entrepreneurs: quality of successful entrepreneurship.
- Factors impacting emergence of entrepreneurship
- Theories of entrepreneurship
- Recognizing opportunities and generating ideas
- Feasibilities analysis
- Writing a business plan
- Choosing a form of business ownership
- Getting financing or funding
- Entrepreneurial development programs
- Cost-volume profit(break-even) analysis

(c) Learning Materials

- Handout
- The innovations dilemma by clayton Christenson
- Business adventures by John Brooks
- The obstacle is the way by Ryan Holiday

- Zero to one by Peter Thiel
- Out of the crisis by Edwards Deming
- Library

MCE 301/302 – PROJECT WORK

(a) Objectives

- To enable the student to demonstrate the personal abilities and skills required to produce and present an external piece of work
- To identify a clear and achievable goal
- To describe the steps followed to achieve the stated goal
- To describe and justify a focus on the chosen area of interaction
- To adhere to the stated goal throughout the project.

SMS 311-RESEARCH METHODS

(a) Objectives

- It helps students to gather good information in writing good reports for project work.

- To assist the students on how to identify problems and ways that will help them to gather information in order to solve problems.
- To acquire knowledge on how to gather accurate information related to problem at hand.
- To familiarized the students with the dimensions and methods of research
- To orient the students to make an informed choice from the large of alternative methods and experimental design available
- To enable students to presents a good research proposal
- To familiarized the students with the nature of research and scientific writing
- To empower the students with the knowledge and skills they need to undertake a research project, to present a conference paper and to write a scientific article.

(b) Contents

- Research methodology
- The research proposal
- Data collection
- Sampling techniques
- Data analysis
- General writing issues in research report writing

(c) Reading Materials

- Hand out
- Library
- Articles on research methods online

MCE 315/316-JIG AND TOOL DESIGN

(a) Objectives

- Its helps students to design and draw the various jigs and fixture in mechanical engineering workshops.
- Its helps students to know the various kinds of jigs and fixtures we have in mechanical engineering.
- Helps student to plan very well especially in designing of jigs and fixtures.
- Its helps students to know the various kinds of clamping, locating devices in production engineering

(b) Contents

- Jigs and fixtures
- Clamping devices

- Planning
- Locating devices

(c) Learning Materials

- Lecture notes(handout)
- Library
- Internet

YEAR 3

AUTOMOBILE ENGINEERING OPTION

MCE 387/388 – WORKSHOP ORGANISATION AND ADMINISTRATION

(a) Objectives

- To provide simple and accessible form, the ways of planning, setting up and running a workshop.
- Is to enhance the student to explain the functions of component involve in workshop organization and administration
- To further develop skills and knowledge in workshop organization and administration.

(b) Contents

- Layout of service complex
- Workshop organization
- Service receptionist
- Warranty
- Customers satisfaction
- Sales forecast
- Forecourt management
- Workshop safety

(c) Learning Materials

- Handout
- Motor vehicle workshop organization administration: Bernard Chandler
- Administration skills: Manmohan Joshi
- Library

MCE 389-MANAGEMENT AND CONTROL OF TRANSPORT

(a) Objectives

- To provides understanding concerning the principles of transport operations management
- To aid the student to use the best practice, methods and tools in transport management
- To help the student to identify the elements of management and the modes of transport

(b) Contents

- Transport system
- Transport system classification
- Mode of transport
- Key operational and commercial advantages and properties
- Road transport
- Air transport
- Sea transport
- The structure and organization of the transportation industry
- Functions of management
- Communication process
- Types of communication

- Types of organization

(c) Learning Materials

- Handout
- Transport management: Dr.S.L.Bhandarkar
- Transport management deliver project: John Snow
- Library

MCE 385/386 –LAW OF BUSINESS AND CARRIAGE

(a) Objectives

- To provide understanding and apply the relevant legal principles in business environment, contracts and carriage of goods.
- To demonstrate a sound knowledge of the laws including relevant treaty law, multilateral law and domestic law
- To provides understanding on how to develop problem solving and analytical skills in the field of business.

(b) Contents

- Law of business
- Defense to contractual information

- Remedies to contractual incapacity
- Condition and warranty
- Utmost good faith
- Agency
- Franchising
- Seat belts
- Carriage
- Conditional sales agreement

(c) Learning Materials

- Hand out
- Business law book by Jane P. Mallor, A. James Barnes
- Mercantile law by Arum Kumar
- Principles of law by Essel R., Charles G, and Dillavou.
- Library

MCE 327 -ENERGY AND ENVIRONMENT STUDIES

(a) Objective

- To have skill and competence to construct and develop quality and environmental management system
- To be able to steer the processes of industrial and public production and services in a sustainable and environmentally sound manner of energy.
- To identify types of energy and monitor emission into air,water, soil and monitor contaminated soil and water

(b) Content

- Energy policy
- Fuel sources
- Energy conservation and efficiency
- Traffic density
- Recycling
- Vehicle waste and environment
- Vehicle emission

(c) Learning Materials

- Handout
- Environmental science by Henry W.

- The science of environmental pollution by Frank Spellman
- Waste management practice by John Pichtel
- Library

MCE 383/384 – AUTOMOBILE WORKSHOP PRACTICE

(a) Objective

- To provide knowledge and skills of workshop practice in a manner that will best meets the needs of the trade as well as industries using professional equipment
- To know how to handle wastes product and other equipment in a safe manner
- To understand the real concept of workshop practice in automobile industries
- To obtain both theoretical and practical experience in the field of automobile workshop

(b) Content

- Automotive shop safety
- Shop work and service information
- Management of outdoor areas
- Handling and storing chemicals

- Trade waste
- Manage hazardous wastes
- Engine lubrication
- Engine cooling
- Brake, steering and suspension system
- Soil waste and resource recovery
- Washing and cleaning activities
- The storm water system
- Procedures and training
- Servicing procedure

(c) Learning Materials

- Handout
- Mechanical workshop practice by K.C.John
- Vehicle maintenance and garage practice by Doshi J.A.
- Library

MCE 381 – AUTOMOBILE ELECTRONICS

(a) Objectives

- To understand the functions and working principles of the main components in the automobile electronics systems
- To aid the student diagnosis and repair various components of electronic system
- To help the student to identify the various types of sensors.

(b) Contents

- Structure of an atom
- Laws of electric charge
- Conductors and insulators
- Transistors
- Relay
- Sensors
- Electronic control unit(ECU)
- Inductive signal generation
- Electronic ignition system component s
- On –board diagnosis systems

- Air bags and seat belt pretensions
- Suspension
- ABS component and operation

(c) Learning Materials

- Hand out
- Understanding automotive electronics William B. Ribbens
- Fundamentals of automotive electronics Alma Hillier
- Library

SMS 311 -RESEARCH METHODS

(a) Objectives

- It helps students to gather good information in writing good reports for project work.
- To assist the students on how to identify problems and ways that will help them to gather information in order to solve problems.
- To acquire knowledge on how to gather accurate information related to problem at hand.
- To familiarized the students with the dimensions and methods of research

- To orient the students to make an informed choice from the large of alternative methods and experimental design available
- To enable students to presents a good research proposal
- To familiarized the students with the nature of research and scientific writing
- To empower the students with the knowledge and skills they need to undertake a research project, to present a conference paper and to write a scientific article.

(b) Contents

- Research methodology
- The research proposal
- Data collection
- Sampling techniques
- Data analysis
- General writing issues in research report writing

(c) Reading Materials

- Hand out
- Library
- Articles on research methods online

MCE 347 -MANAGEMENT PRINCIPLES

(a) Objectives

- To provide better understand of management
- To know how to manage human resources for human betterment and social justice
- To identify the elements in the management field and how to implements them

(b) Contents

- The meaning of management
- The management functions
- Management roles
- The planning process
- Benefit of planning
- Managerial decision making
- Analysis internal environment of an organization
- Leadership
- Motivating and communicating with employees

- Control systems in an organization
- The principles of authority and responsibility

(c) Learning Materials

- Handout
- Principles of management by Mason Carpenter
- The rules of management an introduction by David Boddy

MCE 328 – AUTOMOBILE HEATING AND AIR CONDITOINING

(a) Objectives

- To understand the function of the component and how to repair them also install
- To provide a clear knowledge for the student about the principles of the cycle of operations
- To know the types of refrigerant use in the system
- To understand the transfer of heat in automobile air conditioning

(b) Contents

- Fundamentals of refrigeration.

- Principles of refrigeration.
- Refrigerant.
- Refrigeration equipment.
- Engine cooling system and heating circuits.
- Automatic temperature control.
- Troubleshooting and maintaining your car cooling systems.
- A guide to how vehicle air conditioning system works.
- Basic mechanics of air conditioning.
- Thermodynamics analysis of the system.

(c) **Learning Materials**

- Handout
- Automotive air conditioning :Boyce Duiggins
- Automotive air conditioning and climate control: Steven Daly
- Refrigeration and air conditioning: Manohar Prasad
- Library

ACT 306 –MANAGEMENT ACCOUNTING AND FINANCE

(a) Objectives

- To aid the student to have basic understanding in accounting and finance
- To provide a platform for the student on how to keep account
- To obtain proper interpretation of accounting concepts
- To know how to prepare accurate
- To help utilize resources efficiently
- To measure out comes by providing periodic financial statements which help the firm adjust its operations accordingly

(b) Contents

- Financial accounting information system
- Accounting concept, convention ,bases and policies
- Credit/cash buying and selling
- Depreciation of fixed assets
- Distinction between revenue and capital expenditure
- Cost behavior
- Costing methods and techniques

- Standard costing
- Budgeting planning and control
- Marginal or variables costing levels
- The break-even analysis forms of business entities
- Sources of capital

(c) Learning Materials

- Handout
- Financial accounting :Saylor foundation
- Library

ETP 346 –ENTREPRENEURSHIP

(a) Objectives

- To identify and train potential student entrepreneurs in the field of mechanical engineering
- To impact information about the process, rules, procedure and regulations for setting up a new projects
- To assist the student to obtain knowledge and information about the source of help, incentives and subsidies available from government to set up the project

- To develop small and medium enterprises generation for the students
- To use the entrepreneurial mindset and behave responsibly and ethically in their roles as entrepreneurs
- To creatively analyses business environment, opportunity recognition and business plan ideas generation process.

(b) Contents

- Nature and development of entrepreneurship
- Characteristic of successful entrepreneurs: quality of successful entrepreneurship
- Factors impacting emergence of entrepreneurship
- Theories of entrepreneurship
- Recognizing opportunities and generating ideas
- Feasibilities analysis
- Writing a business plan
- Choosing a form of business ownership
- Getting financing or funding
- Entrepreneurial development programs
- Cost-volume profit(break-even) analysis

(c) Learning Materials

- Handout.
- The innovations dilemma by clayton Christenson.
- Business adventures by John Brooks.
- The obstacle is the way by Ryan Holiday.
- Zero to one by Peter Thiel.
- Out of the crisis by Edwards Deming.
- Library.

MCE 301/302 – PROJECT WORK

(a) Objectives

- To enable the student to demonstrate the personal abilities and skills required to produce and present an external piece of work
- To identify a clear and achievable goal
- To describe the steps followed to achieve the stated goal
- To describe and justify a focus on the chosen area of interaction
- To adhere to the stated goal throughout the project.

INA 301-INDUSTRAIL ATTACHMENT

(a) Objectives

- To develop practical skills in the area of specialization.
- To be able to work in a group or team as engineers mostly work in group to achieve a common goal.
- To enable students know the operations of the various mechanical engineering workshops.

(b) Contents

- Visitation to industries as apprenticeship
- Trade theory acquired in the industries

(c) Learning Materials

- Visitation to industries
- Attachment at industries

YEAR THREE

PLANT ENGINEERING OPTION

MCE 375/376 –PLANT MAINTENANCE AND WORKSHOP SERVICE

(a) Objectives

- After the completing the course the students must be able to carry out plant maintenance without supervision
- Know the operation cycles of the internal combustion engines and the common fault associated with them, how efficient they are and the faults that occur in their various systems and repair them
- Have a clear knowledge on how steam traps operate to remove condensate and other matter, the categories and types of steam traps, where they are applied and how to perform maintenance on them

(b) Contents

- Plant maintenance
- Power transmission machines
- Cranes
- Centrifugal pump
- Engine operating cycles
- Steam traps
- Cooling system

- Lubrication
- Carburation
- Lubrication of rolling bearings
- Heat noise and vibration.

(c) Learning Materials

- Hand out
- Library

INA 301-INDUSTRAIL ATTACHMENT

(a) Objectives

- To develop practical skills in the area of specialization.
- To be able to work in a group or team as engineers mostly work in group to achieve a common goal.
- To enable students know the operations of the various mechanical engineering workshops.

(b) Contents

- Visitation to industries as apprenticeship

- Trade theory acquired in the industries

(c) Learning Materials

- Visitation to industries
- Attachment at industries

MCE 325-INTERNAL COMBUSTION ENGINE

(a) Objectives

- Understand the principles of reciprocating internal combustion engines with the focus on stationary operation.
- Must be able to explain engine performance in terms of power, energy utilization and exhaust emissions by relating it to internal process like combustion, exchange, and varying engine operation conditions.
- Discuss in detail the basic function and development interaction in a modern engine, specifically two and four stroke cycle as they related to reciprocating and rotary engine designs.
- To compare the principles operational differences of the various fuels used in internal combustion engines, their availability and understand the applicability of each.

(b) Contents

- Engine construction
- Lubrication system
- Cooling system
- Engine operation cycles
- Engine operation cycles
- Fuels internal combustion engines
- Engine power, energy utilization and emission
- Comparison of stroke and four stroke engine.

(c) Learning Materials

- Hand out
- Motor vehicle for mechanics
- Hillier's fundamentals of motor vehicle
- Technology for motor vehicle (Edward Arnold)

MCE 323-HEAT TRANSFER

(a) Objectives

- Explain in detail the three types of heat transfer and give examples of each
- Explain why certain materials are better than others for heat transfer
- Apply that they have learn about heat transfer and materials to real – world problem

(b) Contents

- Heat transfer fundamentals
- Modes of heat transfer
- Conservation of energy
- Application of heat transfer
- Boiling and condensation
- Heat exchangers
- Temperature differences

(c) Learning Materials

- Handout
- Library

MCE 337-CONTROL SYSTEM

(a) Objectives

- To generates models of control systems using differential equations
- Analyze the behavior of a control system when input to the system is applied
- To use different control terms and parameters to describe system behavior
- To determine system stability
- To use root locus t assist in control system analyze
- To enable the student to use frequency response to analyze system performance
- Design simple feedback control systems
- To demonstrate effective written communication and team membership through laboratory activities.

(b) Contents

- The control system process control
- Feed forward control
- Element of control system

- Feedback control
- Transfer functions
- Types of process control
- Laplace transforms
- Application of Laplace
- Classification of Laplace transforms
- Differential equations
- Frequency response analysis
- Proportional –integral-derivative control

(c) **Learning Materials**

- Hand out
- Textbooks
- Library

SMS 305/306-MANAGEMENT AND ORGANISATION

(a) Objectives

- To enable student to understand the techniques in the securing maximum output with minimum efforts and resources
- To utilize various factors of production efficiently to increase productivity
- To be able to save time, money and effort which is essential for the prosperity of an enterprise

(b) Contents

- Job design and enrichment
- Motivation
- Handling grievance
- Supervising workers
- Managing total quality

(c) Learning Materials

- Handout
- Library
- Textbook of management and organization

MCE 326–REFRIGERATION AND AIR CONDITIONING

(a) Objectives

- To provide insights in how thermodynamic principles are applied within the air conditioning and refrigeration industry
- To give details on how different components work and influence each other
- To understand how real system used in commercial, industrial refrigeration and air conditioning industry are built up
- To acquire knowledge in refrigeration practical training with hands –on experience incorporated in the courses

(b) Contents

- Basic thermodynamics
- Heat
- Saturation temperature
- Atmospheric temperature
- The vapor compression refrigeration system
- Temperature entropy diagram
- Refrigerants
- The basic refrigeration for beginners

- Preventive maintenance for refrigeration systems
- Trouble shooting

(c) **Learning Materials**

- Handout
- Library
- Textbooks

MCE 324 –ALTERNATIVE ENERGY SOURCES

(a) Objectives

- To harness green and clean renewable energy source in the state for environmental benefits and mitigate global warming
- To conserve and promote energy efficiency and conservation measures in industrial, commercial, and government establishments
- To supplement effort in bridging the gap between demand and supply of power, with renewable energy and sources and strengthening the grid system and evacuation arrangement for renewable energy projects

(b) Contents

- Renewable energy
- Fossil energy
- Nuclear energy
- Solar energy
- Hydro energy
- Geothermal energy
- Wind energy
- Ocean energy
- Biofuels
- Hydrogen fuels
- Sustainable energy

(c) Learning Materials

- Handout
- Textbooks
- Library

ACT 306 –MANAGEMENT ACCOUNTING AND FINANCE

(a) Objectives

- To aid the student to have basic understanding in accounting and finance
- To provide a platform for the student on how to keep account
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- To help utilize resources efficiently
- To measure out comes by providing periodic financial statements which help the firm adjust its operations accordingly

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- Distinction between revenue and capital expenditure

- Cost behavior
- Costing methods and techniques
- Standard costing
- Budgeting planning and control
- Marginal or variables costing levels
- The break-even analysis forms of business entities
- Sources of capital.

(c) Learning Materials

- Handout
- Financial accounting :Saylor foundation
- Library

ETP 346 –ENTREPRENEURSHIP

(a) Objectives

- To identify and train potential student entrepreneurs in the field of mechanical engineering

- To impact information about the process, rules, procedure and regulations for setting up a new projects
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- Feasibilities analysis
- Writing a business plan
- Choosing a form of business ownership
- Getting financing or funding

- Entrepreneurial development programs
- Cost-volume profit(break-even) analysis

(c) Learning Materials

- Handout
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- Business adventures by John Brooks
- The obstacle is the way by Ryan Holiday
- Zero to one by Peter Thiel
- Out of the crisis by Edwards Deming
- Library

MCE 301/302 – PROJECT WORK

(a) Objectives

- To enable the student to demonstrate the personal abilities and skills required to produce and present an external piece of work
- To identify a clear and achievable goal
- To describe the steps followed to achieve the stated goal

- To describe and justify a focus on the chosen area of interaction
- To adhere to the stated goal throughout the project.

SMS 311 -RESEARCH METHODS

(a) Objectives

- It helps students to gather good information in writing good reports for project work.
- To assist the students on how to identify problems and ways that will help them to gather information in order to solve problems.
- To acquire knowledge on how to gather accurate information related to problem at hand.
- To familiarized the students with the dimensions and methods of research
- To orient the students to make an informed choice from the large of alternative methods and experimental design available
- To enable students to presents a good research proposal
- To familiarized the students with the nature of research and scientific writing
- To empower the students with the knowledge and skills they need to undertake a research project, to present a conference paper and to write a scientific article.

(b) Contents

- Research methodology
- The research proposal
- Data collection
- Sampling techniques
- Data analysis
- General writing issues in research report writing

(c) Reading Materials

- Hand out
- Library
- Articles on research methods online.