J. S. UNIVERSITY, SHIKOHABAD

DIPLOMA

2nd Semester

(Mechanical Engineering-Production)

(Mechanical Engineering-Automobile)

SCHEME

&

SYLLABUS

[Effective from the session 2015-16]

STUDY AND EVALUATION SCHEME FOR
THREE YEAR DIPLOMA COURSE IN

MECHANICAL (PRODUCTION ENGG. & AUTOMOBILE ENGG.)

SEMESTER - Second

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional	End Exam	Total	Duration
THEORY SUBJECT										
1	DAS-22	Applied Mathematics-II	4	1	-	-	20	50	70	2.5
2	DAS-23	Applied Physics-II	4	1	-	-	20	50	70	2.5
3	DME-21	Applied Mechanics	4	1	-	-	20	50	70	2.5
4	DME-22	Elements of Mech. Engg.	4	1	-	-	20	50	70	2.5
5	DME-23	Elementary Workshop Tech.	4	1	-	-	20	50	70	2.5
PRACTICA/DRAWING SUBJECTS										
6	DAS-23P	Applied Physics-II Lab	-	-		-	20	40	60	3
7	DME-21P	Applied Mechanics Lab	-	-		-	20	40	60	3
8	DWP-21P	Workshop Practice	-	-	4	-	30	60	90	3
9	DME-22P	Elements of Mech. Engg.	-	-	4	-	20	40	60	3
10	DFE-21P	Field Exposure-I	-	-	-	-	30	-	30	2
Games//Social and Cultural Activities + Discipline (15 + 10)									25	
Grand Total									675	

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

DAS-22 Mathematics - II

Unit -1:Integral Calculus-I

Methods of finding indefinite integral
1. Integration by substitution
2. Integration by parts
3. Integration by partial fraction
4. Integration of special functions

Unit-2:Integral Calculus-II

1.Definite integral: definition and properties, Evaluation of integrals
2. Applications of definite integrals: Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution,
3.Numerical Integration: Trapezoidal rule, Simpson`s 1/3rd rule and Simpson`s 3/8 th rule

Unit-3:Coordinate Geometry-I

1.Circle : Equation of circle in standard form, centre –radius form , diameter form and two intercept form.
2. Standard form of curves and their simple properties:
Parabola
Ellipse
Hyperbola

Unit-4: Coordinate Geometry-II

1.Distance between two points in space , direction cosines and direction ratios, Finding equation of a straight line and shortest distance between two lines.
2. Sphere

DAS-23 Applied Physics-II

1. Optics

Nature of light, Laws of Reflection and Refraction, Snell's Law, Interference (Constructive and Deotructive), Diffraction and Polarization (Concept Only), Law of Mallus and Polaroids.

2. Introduction To Fibre Optics :

Critical angle, Total internal reflection, Principle of fibre optics, Optical fibre, Pulse dispersion in step-index fibres, Graded index fibre, Single mode fibre, Optical sensor.

3. Lasers and its Applications

Absorbtion and Emission of energy by atom, Spontaneous and Stimulated Emission, Poluation inversion, Main component of laser and types of laser- Ruby Laser, He-Ne laser and their applications. Introduction to MASER.

4. Electrostatics :

Coutomb's Law, Electric field, Electric potential, Potentialenergy, Capacator, Energy of a charged capacitor, Effect of dielectric on capacators.

5. D.C. Circuits

Ohm's Law, Kirchoff's Law and their simple application, Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); Carey Foster's bridge, potentiometer.

6. Magnetic Materials and Their Properties:

Dia, Para and Ferro-magnetism, Ferrites, Magnatic Hysteresis Curve and its utility. Basic idea of super conductivity, Meissner's effect.

7. Semiconductor Physics

Concept of Energy bands in soldis, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semiconductors, Electrons and holes as charge carriers in semiconductors, P-type and N-type semiconductors.

8. Junction Diode and Transister :

Majority and Minority charge carriers,P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics, Formation of transistor, transistor-action, Base, emitter and collector currents and their relationship LED's.

9. Introduction To Digital Electronics :

Concept of binary numbers, Interconversion from binary to decimal and decimal to binary. Concepts of Gates (AND, NOT,OR).

10. Non-conventional energy sources:

(a) Wind energy : Introduction, scope and significance, measurement of wind velocty by anemometer, general principle of wind mill.

(b) Solar energy: Solar radiation and potentiality of solar radiation in India, uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector.

DAS-23P Applied Physics-II Lab

Note: Any 5 experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.
2. Determination of 'g' by plotting a graph T2 verses l and using the formula g=4n2/Slope of the graph line
3. Determine the force connstant of combinationof springs incase of 1. Series 2. Parallel.
4. To verify the series and parallel combination of Resistances with the help of meter bridge.
5. To determine the velocity of sound with the help of resonance tube.
6. Determination of viscosity coefficient of a lubricant by Stoke's law.
7. Determination of E1/E2 of cells by potentio meter.
8. Determination of specific resistance by Carry Foster bridge.
9. Determination of resitivity by P.O.Box.
10. Verification of Kirchoff's Law.
11. To draw Characteristics of p-n Junction diode.

DME-21 Applied Mechanics

1. Introduction:

Mechanics and its utility. Concept of scaler and vector quantities. Effect of a force. Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force.

2.A. System of Forces :

Concept of coplaner and non-coplaner forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a praticle,conditions of equilibrium of coplaner concurrent force system.

B. General Condition of Equilibrium:General condition of equilibrium of a rigid body under the action of coplaner forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body.

3. Moment & couple:

Concept of Varignon's theorem. Generalised theorem of moments. Application to simple problems on levers-Bell crank lever, compound lever, steel yard, beams and wheels, lever safety valve, wireless mast, moment of a couple; Properties of a couple ; Simple applied problems such as pulley and shaft.

4. Friction:

Types of friction:statical,limiting and dynamical friction,statement of laws of sliding friction, Coefficient of friction, angle of friction; problems on eqilibrium of a body resting on a rough inclined plane, simple problems on friction. Conditions of sliding and toppling.

5. Machines:

Definition of a machine. Mechancial advantage, velocity ratio, input, output, mechanical efficiency and relation between them for ideal and actual machines. Law of a machine Lifting machines such as levers, single pulley, three system of pulleys. Weston differential pulley, simple wheel and axle, differential wheel and axle. Simple screw jack,differential screw jack, simple worm and worm wheel.

6. Centre of Gravity:

Concept, definition of centroid of plain figures and center of gravity of symmetrical solid bodies. Determination of centroid of plain and composite lamina using moment method only, Centroid of bodies with removed portion. Determination of center of 'gravity' of solid bodies - cone, cylinder,hemisphare and sphere, composite bodies and bodies with portion removed.

7. Moment of Inertia:

Concept of moment of inertia and second moment of area and radius of gyration, theorems of parallel and perpendicular axis, second moment of area of common geometrical section : rectangle, triangle, circle (without derivations). Second moment of area for L, T, I and channel section, section of modulus.

8. Beams & Trusses:

Definition of statically determinate and indeterminate trusses. Types of supports. Concept of tie & strut, Bow'snotation, space diagram, polar diagram, funicular polygon; calculation of reaction at the support of cantilever and simply supported beams and trusses graphically and analytically; graphical solution of simple determinate trusses with reference to force diagram for determining the magnitude and nature of forces in its various members.

Analytical methods: method of joints and method of sections.

DME-22 Elements of Mech. Engg.

1. Thermal Engg.

A. SOURCES OF ENERGY:

Definition, Concept of thermodynamic system and surroundings, Closed system, Open system, Isolated system, Thermodynamics definition of work.Zeroth low of dynamics

Basic ideas, conventional and nonconventional forms-Thermal, Hydel, Tidal, wind, Solar, Biomass and Nuclear and their uses.

B. FUELS & COMBUSTION:

Introduction to common fuels - solid, liquid and gases and their composition. Combustion of fuels- their higher and lower calorific values. Combustion equations

for carbon, sulphur, hydrogen and their simple Corrected and Approved By B.T.E. on Dated 27.05.2015compounds. Calculation of minimum amount of air required for complete combustion. Combustion analysis on mass basis and on volume basis. Concept of excess air in a boiler furnace combustion. Heat carried away

by flue gases. Analysis of flue gases by Orsatapparatus. Simple numerical problems

Idea of specific properties of liquid fuels such as detonation, knock resistance (cetane and octane numbers), viscosity, solidification point, flash point and flame point.

2. MACHINE COMPONENTS:

Brief Idea of loading on machine components.

(i) Pins, Cottor and Knuckle Joints.

(ii) Keys, Key ways and spline on the shaft.

(iii)Shafts, Collars, Cranks, Eccentrics.

(vi) Couplings and Clutches.

(v) Bearings-Plane, Bushed, Split-step, ball, Roller bearing, Journal bearing, Foot step bearing, thrust bearing, collar bearing and Special type bearings and

their applications. Selection of ball bearing and roller bearing for given application using design data book.

(vi) Gears :

Different types of gears, gear trains and their use for transmission of motion. Determination of velocity ratio for spur gear trains; spur gear, single and

double helical gears, Bevel gears, Mitre wheel, worms,Rack and Pinion. Simple and compound and epicyclic gear trains and their use. Definition of pitch and pitch circle & module.

(vii) Springs:

Compression, Tension, Helical springs,Torsion springs,Leaf and Laminated springs. Their use and material.Selection of spring by design data book, simple numerical problem.

(viii)Transmission of Motion By Belts, Ropes & Pulleys,Chain & Sporckets :Open and cross belt drive, determination of velocity ratio. Effect of thickness and slip on the velocity ratio (Concept only, No mathematical treatment), Method of prevention of slip. Determination of velocity ratio in compound belt drive, use of stepped pulley.Classification and uses of ropes in transmission operation. Chains and their classifications, their application in power transmission, their comparison

with other drive systems

3. MECHANISMS:

Definition of link, Frame and mechanism. Difference between machine and machanism, kinematic pairs, lower and higher pairs. Velocity diagram for four bar mechanism, slider crank mechanism, quick return mechanism. Introduction to Cam and its use.

4. LUBRICATION:

Different lubrication system for lubricating the components of machines.Principle of working of wet sump and dry sump system oflubrication. (Explain with simple line diagram). Selection of lubricant bsed on different application (Requirement with the help of manufacturer catalogue).NOTE: While teaching theory it is important to bring and show the

machine components to the students.

DME-22P ELEMENTS OF MECHNICAL ENGINEERING-LAB

A. Study and demonstration of the following

1. (a) Bio Gas Plant.

(b) Wind Mill.

(c) Solar Cooker.

(e) Voltaic Cell Type Soalr Energy Converter.

2. Key's, Key ways and Splined shaft e.g. Jib head key, Flat key, Saddle key, Woodruff key, Feather key, Pin key, Splinedshaft.

3. Pins- Split pin, Taper cotter type split pin, Cottor pin,Foundations Bolts- Lewis rag bolt, Fish tail bolt and Square head bolt.

4. Friction clutch and Coupling- Cone cluch, Plate cluch (Single Pair); Muff coupling, Flange coupling, Universal or Hook's joint coupling. Flexible coupling- Belt and Pin Type,Coil spring type.

5. Bearings- Plane, Bush, Split step bearings, Ball Roller bearings, Thrust bearings.

6. Gears- Spur gear, Single and Double herical gears, Bevelgears.

7. Gear Trains- Simple spur gear train, Compound gear train,Epicyclic gear train.

8. Compressor and Tension helical springs.

9. Slider Crank Mechanism.Performance Practicals:

10. Determine the angle covered in forward and return stroke of Quick Return Mechanism of available shaper in machine shop.

11. Estimate the amount of ash and moisture in given sample of coal or coke

12. Deterimination of velocity ratio of a spur gear train.

13. Velocity diagram of a four bar chain mechanism.

14. Performance evaluation of solar cooker.

DME-23 Elementary Workshop Tech.

1. GENERAL INTRODUCTION:
(a) Scope of subject "Workshop Technology" in engineering.(b) Different shop activities and broad division of the shops on the basis of nature of work done such as
(i) Wooden Fabrication (Carpentry)
(ii) Metal Fabrication (shaping and Forming, Smithy,Sheet metal and Joining-welding, Rivetting,Fitting and Plumbing.
(c) Organization and layout of workshop.
(d) General safety preaction in workshop
2. CARPENTRY :
(a) Types of wood and timber, Cutting and seasoning of wood, Decaying of wooden component.
(b) Fundamental of wood working operations:
- Marking & Measuring.
- Holding & Supporting.
- Cutting & Sawing.
- Drilling & Boring.
- Turning.
- Jointing.

(c) Common Carpentry Tools:Their classification, size, specification (name of the parts and use only).
(1) Marking and measuring tools:Rules, try square, Bevel Square, Marking gauge, Mortise gauge, Scriber (marking knife). Combination set
(2) Holding and supproting Tools:Carpentary vice, Bench hold fast, Bar clamp, Bench hook, Hand clamp C and G clamp.
(3) Cutting and Sawing Tools:Saws: (Grip or Hand, panel, cross cut, Tenon, dove tail, compass, key hole and bow saw),
Chisel: (Firmer, dovetail, mortise and gauge),
Planes: (Wooden & Iron plane. Jack plane, Smoothing plane).
(4) Drilling and Boring tools: Auger, Gimlet, Hand drill,Brace and bits.
(5) Striking Tools: Mallet and Claw hammer.
(6) Turning Tools & Equipments: Wood working lathe and lathe tools.
(7) Miscellaneous Tools: Screw driver, Rasp, Pincer, Oil stone, Triangular file and Saw set.
(d) Joining of Timber Components For Fabrication Works:Assembly of joints (Preparation steps and tools usedonly) Mortise, Tenon, Rivet , Groove, Tongue, Dowel,operations in assembly-Simple lap and butt, Mortise,Tenon, Dovetail, Mitre & briddle joints. Uses of glue,dowelpin and screw in preparation of joints. Common defects likely to occur during and after joining,defects due to wrong use of tools, defects due to wrong operation, defects due to improper seasoning of timbertheir identification and remedy. Safety (personal and equipment) to be observed.
3. METAL FABRICATION:
(A) Metal Shaping :Smithy:
(1) Operations involved (concept only)-Preparation of fire, Supporting and holding the metal, cutting the metal in size, heating, drawing down or fullering, usetting, swaging, bending, punching,blanking, drifting and forge welding,
(2) Tools and equipment used (Names, size,specification for identification only).
(3) Heating and fuel handling equipment-Smithy Forge,Blower, Shovel, Poker.
(4) Holding and supporting tools-Common tongs, anvil,swage block.(5) Striking Tools-Ball pein, cross pein ,Straightpein double face and sledge hammers .
(6) Cutting tools - Hot and cold chisel and shear set.
(7) Punching & Drifiting Tools - Punch & Drift.
(8) Bending Tools and fixture.
(9) Forming & Finishing Tools - Fullers, Swage Flatters, Set hammers.
(10) Defects likely to Occur during and after operations their Identification and Remedy.Defects due to wrong operation , wrong tool and wrong heating.

(11) Safety of Personnel, Equipment & Tools to be observed.
(12) Study of forge hammers and power presses.
(2) Sheet metal working:
(I) Tools and Operation:
(1) Operations involved (Names and concept only)Laying out, marking and measuring,cutting, Shearing and blanking, Straightening bending and seaming,Punching and piercing , burring and stamping,
(2) Sheet metal joints - Lap, seam, Locked seam,hemp,wirededge, cup or circuler, Flange, angular and cap.
(3) Tools and equipments used (Name, size,specification for identification only).
(4) Marking Tools- Scriber, Divider and Trammel,Protractor, Trysquare, Dot punch, Steel Rule, Steel tape, Sheet metal gauge.
(5) Cutting and shearing Tools-hand Shear and lever,Snips, Chisels.
(6) Straightening tool-Straight edge.
(7) Striking Tools-Mallet, Hammer.
(8) Holding Tools-Vice, Plier, C or G clamps, Tongs.
(9) Supporting Tools-Stakes and Anvil.
(10) Bending Tools-Crimpers, Form dies, Roundnose plier, Rails.
(11) Punching-Piercing and Drifting tools.
(12) Burring Tools-Files.
(13) Common defects likely to occur during and after operation-Their identification and remedy. Defects due to wrong operation or wrong tool.
(14) Safety of Personnel, Equipment & Tools to be observed.
(15) Development and estamination of sheet for simple articles.
(B) Metal Joining During Fabrication:
(1) Permanent Joining:
(a) (1) Welding methods-Forgewelding, gas welding (high and low pressure-oxyacetylene welding, types of flames.
(2) Electric welding- D.C. & A.C., Connected tools, operation, materials and safety measures.
(b) Soldering & Brazing:For black Galvanised and Tincoated Iron sheet,brass and copper sheets only.
(1) Its concept, comparison with welding as joining method and classification, electric soldering and forge soldering.
(2) Soldering operation- edge preparation of joints,Pickling and degreasing, Fluxing, Tinning and Soldering.
(3) Materials Used-Common fluxes, soft and hard solder, solder wire (Plain and Resin core) and sticks, spelters and their specifications and discription (For Identification Only), forge soldering bits.
(4) Electric soldering iron.
(5) Common defects likely to occurs during and after soldering.
(6) Safety of Personnel, Equipment & Tools to be observed.
(c) Rivetting:
(1) Its comparison with welding as joining method.
(2) Rivets and Materials.
(3) Operation involved-Marking from given data, edge preparation, drilling and punching arrangements of joint elements (Lap, Butt with single cover plate and double cover plate) upsetting of rievet tail,shaping head and caulking.
(4) Tools and equipments used- (Names, Size,Specification and uses)-Supporting and holding tools (Stakes and Tonqs)-Striking tools-Ball pien, Straight pien and Cross pien hammers and head forming tools (Shapes), drills punches and solid punches, drift, elementary knowledge about working of pneumatic, hydraulic and electric rivetor.
(2) Temporary Joining (Fastners & Their Uses):Introduction to
(1) Various types of Bolts (Names of prats and specification) and various types of washers and nuts used with them and their uses, material they are made of , studs and foundation bolts.
(2) Screws, keys, pins and cottors-their material and use.
(3) Pipe connectors-Sockets, elbows, tees, cross and bends, unions, volves, glands packing and operation in use of pipe connectors-cutting,marking, threading, pipe bending, joining different pipe line fittings- (Steps of operation only).Tools and equipment used in their operations (Name,Size, Specification and Discription for Identification).Supporting and holding tools-Pipe vices (Bench, leg and hand), Pipe

wrenches, Spanners.Cutting Tools- Hack saw and Pipe cutters.Threading Tools- Pipe dies and Taps.Materials Used for Joining-White lead, Cotton and Gasket.Common defects lickely to occur during and after operation and their remedies.

(3) Familiarity with The Use of Various Tools Used In Mechanical Engineering Workshop:

Marking & Measuring:Steel rule, surface gauge, marking block, protractor,trysquare, scriber, punches, divider and callipers,surface plate, V. block, gauges- (screw, pitch,radius, feeler), Vernier callipers, Micrometer, Vernierheight and depth gauge, use of dialgauge.

Holding Tools:Vices (Bench, leg and hand vice), clamps tongs, pliers,Cutting Tools:

Hack saw (Fixed and Adjustable framce), chisels-flat,cross cut, diamond, round nose.

Files:According to section-Knife edge, Flat, Triangularround, Square, Half round,According to grade -

Rough, Bastard, Second cut, Smooth and Dead smooth,Drills and Allied Tools:

Parallel and taper shank Twist drill,Thread Cutting Tools:Taps and Dies,Miscellaneous Tools:

Wrenches, Keys, Spaners, Pliers, Screw drivers their specification and many others which have not been named for use in various shops. They should be shown physically to each student for famillarity.

4. PROTECTION OF FABRICATED STRUCTURES FROM WEATHER:

1. PAINTING:Its need, Introduction to methods of paintings (Classification only); Mannual, Machine (spray) and dippainting at room temperature, operations involveddiscription

of steps only eg. surface preparation method for old and new surface in timber and iron structure-sanding,derusting, deqreasing, filling of pore and dents, paint application- manual, machine (spray and dip painting drying of paint air drying and oven drying under coat and filler material (red oxide, putty, yellow clay), surface preparation materials (sand and emery papers); tools and equipments used (Name, size specification for indification).

Brushes-Round and flat wire brush, scraper, trowel , spray gun, compressor.Defects likely to occur in painting and their remediesSafety of Personnel, Equipment & Tools to be observed.

2. VARNISHING & POLISHING:

Its need operation involved (description of step only),surface preparation method of old and new articles,application of polishing materials, materials used for preparation of french and sprit polish,copal varnish.Defects likely to occur.Safety of Personnel, Equipment & Tools to be observed.

5. FOUNDRY WORK:

Elementary idea of patterns, Types of moulds, sand and green sand moulds and moulding, tools and equipment used in green sand moulding.

6. MACHINE SHOP:

Introduction to machine tools viz lathe, drilling machine,shaper and planer simple line and block diagram

of components and their functions. Brief concept of NC and CNC machines.

DWP-21P WORKSHOP PRACTICE

1. Carpentry Shop :
EX-1 Introduction & demonstration of tools used in carpentry shop and different types of joints, types of wood, seasoning and preservation of wood
EX-2 Planing and sawing practice
EX-3 Making of lap joint
EX-4 Making of mortise and tenon joint
Ex-5 Making of any one utility article such as woodenpicture frame, hanger, peg, name plate, etc.
2. Painting and Polishing Shop:
EX-1 Introduction of paints, varnishes, Reason for surface preparation, Advantange of painting, other method of surface coating i.e. electroplating etc.
EX-2 To prepare a wooden surface for painting apply primeron one side and to paint the same side. To prepare french polish for wooden surface and polish the other
side.
Ex-3 To prepare metal surface for painting, apply primer and paint the same.
EX-4 To prepare a metal surface for spray painting,first spray primer and paint the same by spray painting gun and compressor system.
* The sequence of polishing will be as below:
i) Abrassive cutting by leather wheel.
ii) Pollishing with hard cotton wheel and with polishing material.
iii) Buffing with cotton wheel or buff wheel.
3. Sheet Metal and Soldering Shop :
EX-1 Introduction and Types of sheets, measuring of sheets
EX-2 Study and sketch of various types of stakes/anvil.
EX-3 Introduction & demonstration of tools used in Sheet metal working shop.
EX-4 Cutting, shearing and bending of sheet.
EX-5 To prepare a soap case by the metal sheet.
EX-6 To make a funnel with thin sheet and to solder the seam of the same.
EX-7 To make a cylinder and to solder the same.
EX-8 Preparation of different type of joints such as Lap joint-single seam, double seam. Hemp and wired joints.
EX-9 To braze small tube/conduit joints.
4. Fitting Shop, Plumbing Shop & Fastening Shop:
EX-1 Study of materials, limits, fits and toterances.
EX-2 Introduction & demonstration of tools used in Fitting Shop.
EX-3 Hacksawing and chipping of M.S. flat. Filing and squaring of chipped M.S. job. Filing on square or rectangular M.S. piece.
EX-4 Making bolt & nut by tap and die set and make its joints
Ex-5 To drill a hole in M.S. Plate and taping the same to creat threads as per need.
EX-6 Utility article-to prepare double open mouth spanner for 18" hexagonal head of a bolt.
EX-7 Cutting and threading practice for using socket, elbow and tee etc. and to fit it on wooden practice board. EX-8 Study of-bib cock, cistern or stop cock, wheel valve and gate valve etc.
EX-9 Practice of bolted joints
EX-10 To prepare a rivetted
joint EX-11 To make a pipe joint
EX-12 To make a threaded joint
EX-13 Practice of sleeve joint
5. Foundry Work
Ex-1 Study of metal and non metals
Ex-2 Study & sketch of the foundry tools. Ex-
3 Study & sketch of cupula & pit furnace.
Ex-4 To prepare the green moulding sand and to prepare moulds (single piece and double piece pattern sweep mould) Ex-5 Casting of non ferous (lead or aluminium) as per exercise 3.

6. Smithy Shop :
EX-1 Study & Sketch of Tools used in smithy shop.
EX-2 To prepare square or rectangular piece by the M.S.rod.
EX-3 To make a ring with hook for wooden doors.
EX-4 Utility article-to preapre a ceiling fan hook.
7. Welding Shop :
EX-1 Introduction to welding, classinfication of welding,types of weld joints.
EX-2 Welding practice-gas and electric.
EX-3 Welding for lap joint after preparing the edge. EX-
4 Welding of Butt joint after preparation of the edge.
EX-5 'T' joint welding after preparation of edge.
EX-6 Spot welding, by spot welding machine.
8. Machine Shop
EX-1 Study & sketch of lathe machine.
EX-1 Study & sketch of grinders, milling M/c, Drilling M/c and CNC Machines
Ex-2 Plain and step turning & knurling practice.
Ex-3 Study and sketch of planning/Shaping machine and to plane a Ractangle of cast iron.

DFE-21P FIELD EXPOSURE-1

The aim of this course is to train the students to learn working in industry situations under supervision of industry staff. The whole department faculty should be deputed for this purpose.Head of faculty should procure seats for giving summer training for students with the assistance of Director, Board of Apprenticeship Training.

A small project like study of material handling system,Plant layout study, Inventory control, Work study, Process control rejection and rework study, Inspection system and

Quality control, etc. may be alloted.

DME-21P Applied Mechanics Lab

1. To verify the law of Polygon of forces.
2. To verify the law of parallelogram and triangle of forces.
3. To verify the law of principle of moments.
4. To find the coefficient of friction between wood,steel,copper and glass.
5. To find the reaction at supports of a simply supported beamcarrying point loads only.
6. To find the forces in the jib & tie of a jib crane
7. To find the forces in the members of a loaded roof truss.(King / Queen post truss)
8. To find the mechanical advantage, velocity ratio and efficiency of any three of the following machines:

(i) Simple wheel & axle
(ii) Differential wheel & axle
(iii) Differential pulley block
(iv) Simple Screw jack
(v) Simple Worm & worm wheel
(vi) System of Pulleys (any type).

9. To find out center of gravity of regular lamina.
10. To find out center of gravity of irregular lamina