KARANATAKA STATE OPEN UNIVERSITY

DIPLOMA IN AUTOMOBILE ENGINEERING

SEMESTER SYSTEM

SYLLABUS

I YEAR SYLLBUS

(Basic Engineering)
(Common to all Branches)

Subject Code	Subject Title	Max Marks	Max Credits
Semester-I			
BE101	Communication English	100	4
BE102	Applied Mathematics-1	100	4
BE103	Engineering Physics-I	100	4
BE104	Engineering Chemistry-I	100	4
BE105	Computer Application Lab	100	2
BE106	Workshop Practice Lab	100	2
Semester –II			
BE201	Applied Mathematics-II	100	4
BE202	Engineering Physics-II	100	4
BE203	Engineering Chemistry-II	100	4
BE204	Engineering Graphics	100	4
BE205	Physics Lab	100	2
BE206	Chemistry Lab	100	2

Automobile Engineering
III Semester

Subject Code	Subject Title	Max Marks	Max Credits
AE 301	Engineering Mechanics	100	4
AE 302	Manufacturing Technology-I	100	4
AE 303	Fluid Mechanics	100	4
AE 304	Machine Drawing	100	4
AE 305	Engineering Mechanics Lab	100	2
AE 306	Workshop-I	100	2

IV Semester

Subject Code	Subject Title	Max Marks	Max Credits
AE 401	Thermodynamics	100	4
AE 402	Manufacturing Technology-II	100	4
AE 403	Automobile Electrical and Electronics	100	4
AE 404	Automobile Chassis	100	4
AE 405	Automobile Electrical and Electronics Lab	100	2
AE 406	Workshop-II	100	2

Automobile Engineering
V Semester

Subject Code	Subject Title	Max Marks	Max Credits
AE 501	Automobile Transmission	100	4
AE 502	Vehicle Body Technology	100	4
AE 503	Two & Three Wheelers Technology	100	4
AE 504	Tractor and Farm Equipment	100	4
AE 505	Automobile Chassis and Transmission Lab	100	2
AE 506	Automobile Workshop	100	2

VI Semester

Subject Code	Subject Title	Max Marks	Max Credits
AE 601	Industrial Engineering and Road Transport	100	4
AE 602	CAD/CAM	100	4
AE 603	Automotive Maintenance and Pollution Control	100	4
AE 604	CAD/CAM Lab	100	2
AE 605	Project	100	8

Total Marks = 3800
Total Credits = 122

SEMESTER : I
Subject Code : BE 101
Subject Title : Communication English
Structure of the Course Content

BLOCK 1 Grammar (Non-Textual)

Unit 1: Functional Analysis
Unit 2: Voice and parts of speech
Unit 3: Direct and indirect speech
Unit 4: Preposition

BLOCK 2 Grammars

Unit 1: One word substitute
Unit 2: Articles and question tags
Unit 3: Prefixes and suffixes
Unit 4: Tenses

BLOCK 3 Compositions

Unit 1: Comprehension
Unit 2: Simple passage
Unit 3: Moral story
Unit 4: Science and technology

BLOCK 4 Letter and dialogue Writing

Unit 1: Letter writing - personal
Unit 2: Letter writing - official
Unit 3: Dialogue writing
Unit 4: Hints development

BLOCK 5 Proses

Unit 1: An Astrloger's day – R.K. Narayanan
Unit 2: The sun, the planets and the stars – C.Jones
Unit 3: The continuing spell of Ramanujam
Unit 4: On saying 'please' – A.G.Gardiner

Books:

1. Orient Longman, Anna Salai, Chennai-600002.
2. The Advanced Learners Dictionary of Current English by A.S.Hornby, Oxford University Press. 1973
3. High School English Grammar and Composition by Wren & Martin, S.Chand & Co Ltd., 2005
4. Vocabulary in Practice - Part 1 to 4 by Glennis Pye, Cambridge University Press,
5. Learn Correct English by Shiv K. Kumar & Hemalatha Nagarajan, Pearson Longman, 2005
6. Essential English Grammar by Raymond Murphy, Cambridge University Press,
7. Common Errors in English by M.Thomas, Lotus Press, New Delhi, 2006
8. Basic English Usage by Michael Swan, ELBS/OUP, 1989
9. Communication Skills for Engineers by Mishra, Ist Edition, Pearson Longman
10. Basic English Dictionary by Longman Longman Ist Edition, Pearson Longman

SEMESTER : I
Subject Code : BE 102
Subject Title : Applied Mathematics - I
Structure of the Course Content

BLOCK 1 Algebra

Unit 1: Determinants
Unit 2: Matrices
Unit 3: Permutation and combination
Unit 4: Binomial Theorem

BLOCK 2 Complex numbers

Unit 1: Real and imaginary parts
Unit 2: Demoivre's Theorem
Unit 3: Finding the n^{th} roots of unity
Unit 4: Solving equations

BLOCK 3 Analytical geometry

Unit 1: Pair of straight lines
Unit 2: Circles
Unit 3: Family of circles
Unit 4: Concentric circles

BLOCK 4 Trigonometry

Unit 1: Compound angles
Unit 2: Multiple angles
Unit 3: Sub multiple angles
Unit 4: Sum and product formulae

BLOCK 5 Differential calculus

Unit 1: Limits
Unit 2: Differentiation
Unit 3: Differentiation methods
Unit 4: Successive differentiation

Books :

1. Engineering Mathematics by Dr M.K.Venkatraman, National Publishing Co.
2. Engineering Mathematics by Dr P.Kandasamy, S.Chand & Co, New Delhi
3. Higher Engineering Mathematics by Ramana, Tata McGraw Hill, New Delhi
4. Engineering Mathematics by Singh, Tata McGraw Hill, New Delhi
5. Advanced Engineering Mathematics by N.Bali,M.Goyal,C.Watkins,Lakshmi Publications (Pvt) Ltd, New Delhi
6. Engineering Maths by T.Veerarajan, Tata McGraw Hill, New Delhi
7. Schaum's Outline of Technical Mathematics by Paul Calter, Tata McGraw Hill, New Delhi
8. Engineering Mathematics Vol-III by Dr. B. Krishna Gandhi , Dr. T.K.V Iyengar, S.Ranganatham, , S.Chand & Co, New Delhi
9. Introduction to Engineering Mathematics by H.K. Dass, Dr.Rama Verma, S.Chand & Co, New Delhi
10. Applied Engineering Mathematics Vol-II by H.K.Dass, S.Chand & Co

SEMESTER : I
Subject Code : BE 103
Subject Title : Engineering Physics - I
Structure of the Course Content

BLOCK 1 S I units and Statics

Unit 1: Fundamental quantities
Unit 2: Derived quantities
Unit 3: Concurrent forces
Unit 4: parallelogram Law of forces

BLOCK 2 Properties of matter

Unit 1: Stress and strain
Unit 2: Young's modulus
Unit 3: Viscosity
Unit 4: Surface Tension

BLOCK 3 Dynamics

Unit 1: Projectile Motion
Unit 2: Angle of projection
Unit 3: Circular Motion
Unit 4: Application of circular motion

BLOCK 4 Rotational motions of rigidity bodies

Unit 1: Moment of Inertia
Unit 2: Kinetic energy
Unit 3: Angular Momentum
Unit 4: Kepler's Law

BLOCK 5 Remote sensing and sound

Unit 1: Active and Passive remote sensing
Unit 2: Microwave remote sensing
Unit 3: Types of sound waves
Unit 4: Acoustics

Books :

1. Physics by Resnick and Hoilday ,Wisley Toppan Publishers – England
2. Mechanics by Narayana Kurup , S. Chand Publishers – New Delhi
3. Engineering Physics by B.L. Theraja , S. Chand Publishers – New Delhi
4. Remote sensing by Dr.M.Anji Reddy, Jawaharlal Nehru Technological University –Hyderabad.
5. Engineering Physics by V.Rajendran, Tata McGraw Hill, New Delhi
6. Engineering Physics by Vikram Yadav, Tata McGraw Hill, New Delhi
7. Schaum's Outline of Physics for Engineering and Science by Michael Browne, Tata McGraw Hill, New Delhi
8. Modern Engineering Physics by A.S.Vasudeva, S. Chand Publishers, New Delhi
9. Engineering Physics Fundamentals & Modern Applications by P.Khare and A.Swarup, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Engineering Physics by Dipak Chandra Ghosh,Nipesh Chandra Ghosh,Prabir Kumar Haldar, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : I
Subject Code : BE 104
Subject Title : Applied Chemistry - I
Structure of the Course Content

BLOCK 1 Acids – Bases, Catalysis

Unit 1: Theories of Acids and Bases
Unit 2: Industrial application
Unit 3: Positive and Negative catalyst
Unit 4: Characteristics of Catalyst

BLOCK 2 Pollution

Unit 1: Air Pollution
Unit 2: Global warming
Unit 3: Water Pollution
Unit 4: Green Chemistry

BLOCK 3 Electro chemistry and corrosion

Unit 1: Types of conductors
Unit 2: Industrial applications of Electrochemistry
Unit 3: Electrochemical theory
Unit 4: Electroplating

BLOCK 4 Organic coatings

Unit 1: Paint
Unit 2: Varnish
Unit 3: Adhesives
Unit 4: Lubricants

BLOCK 5 Colloids and Ceramics

Unit 1: Colloidal solution
Unit 2: Brownian movement
Unit 3: Water purification
Unit 4: Ceramics

Books :

1. Inorganic chemistry by Soni PL, Sultan Chand &sons.
2. Organic chemistry by Soni PL, Sultan Chand & sons.
3. Engineering chemistry by Jain & Jain, Dhanpat rai &co
4. Engineering chemistry by Uppal , Khanna publishers
5. Environmental chemistry &Pollution control by Dara .SS, S. Chand&co
6. Environmental Pollution by . Tripathy .SN , Sunakar panda - Vrinda publication
7. Rain water Harvesting-hand book by Chennai Metro Water
8. Introduction to Engineering Chemistry by Minaxi B Lohani, Upma Misra, S.Chand & Co, New Delhi
9. Engineering Chemistry by Dr.A.K.Pahari,Dr.B.S.Chauhan, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Advanced Engineering Chemistry by M.Senapati, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : I
Subject Code : BE 105
Subject Title : Computer Application Lab

Practicals
Windows

1.a. Starting a program, running a program.

b. Starting the Windows in safe mode

c. Running multiple Programs and switching between windows.

d. Moving the windows, and the task bar.

e. Startup to MS-DOS prompts.

2.a. Creating and removing a folder.

b. Making the taskbar wider, arranging icons on the Desktop.

c. Displaying and hiding the taskbar clock.

d. Controlling the size of start menu options.

e. Creating shortcuts.

3.a. Installing a screen saver.

b. Assigning Wallpaper to Desktop.

c. Adding a program to the start menu.

d. Recovering files and folders from Recycle bin.

e. Customizing the mouse settings.

4 a. Expanding and collapsing a folder.

b. Recognizing file types using icons.

c. Running a program from explorer.

d. Renaming a file or folder.

e. Selecting two or more files for an operation.

5.a. Displaying the properties for a file or folder.

b. Using cut and paste operations to copy a file.

c. Using copy and paste operations to copy a file.

d. Moving and copying files with mouse.

e. Sorting a folder.

6.a. Finding a file or folder, by name.

b. Defragmenting the disk using disk defragmenter.

c. Compressing a file using WinZip.

d. Controlling the speaker volume.

e. Recording and saving an audio file.

MS Word

a. Prepare a newsletter with borders, two columns text, header and footer and a graphic image and spell check the document.

b. Create a table to show the paradigm of the verb "eat" in all 12 tenses

Tense		Present	Past	Future
Simple	He	Eats	Ate	Will eat
	I	Eat	Ate	Will eat
	You/They	Eat	Ate	Will eat
Continuous	He	Is eating	Was eating	Will be eating
	I	Am eating	Was eating	Will be eating
	You/They	Are eating	Was eating	Will be eating
Perfect	He	Has eaten	Had eaten	Will have eaten
	I	Have eaten	Had eaten	Will have eaten
	You/They	Have eaten	Had eaten	Will have eaten
Perfect continuous	He	Has been eating	Had been eating	Will have been eating
	I	Have been eating	Had been eating	Will have been eating
	You/They	Have been eating	Had been eating	Will have been eating

c. Prepare your Bio-data/Resume

d. Do the mail merge operation for sending applications to many companies with your resume

MS EXCEL

1.Create a worksheet in Excel for a company:

a. Copy, Move and Merge the cells

b. Adding Comments

c.Adding, Deleting the cells, Rows and Columns

d. Hiding and Unhiding the columns, Rows and gridlines.

2.Using formula and functions prepare worksheet for storing subject marks of ten students and perform the following:

a. Calculate the student wise total and average

b. Calculate the subject wise total and average

c. Calculate the overall percentage and also individual percentage of the student.

3. Create Bar Graph and Pie Chart for various data

MS Power Point

a. Create a simple presentation with atleast 5 slides to introduce your friend and include sounds in slides.

b. Create a presentation with 5 slides for the essay Astrologer's Day by R.K Narayanan

Internet

a. Creating an E-Mail account.

b. Sending an E-Mail to a known Address

c. Viewing an E-Mail received from your friend/relative.

d. Printing an E-Mail received

e. Use of Attachment Facility

f. Use of Address Book Facility

g. Use of Sent Folder

h. Use of Save Draft Folder

i. Use of Trash Folder

j. Browse a given web-site address.

k.Search a Particular topic through a Search engine.

SEMESTER : I
Subject Code : BE 106
Subject Title : Workshop Practice

Fitting

1. Fitting
2. V - Joint
3. L - Joint
4. T - Joint
5. Half round joint
6. Dovetail Joint
7. U – Joint
8. Hexagonal – Joint
9. Step - Joint
10. Drilling and Tapping M8
11. Drilling and Tapping M10

Wiring

1. Single lamp controlled by single switch.
2. Two Lamps controlled by Two independent switches.
3. Stair case Wiring
4. Fluorescent lamp circuit.
5. Circuit diagram of a fan
6. Circuit diagram of an iron box
7. Circuit diagram of a mixie
8. Soldering practice

Sheet Metal

1. Hemming
2. Seaming
3. Tray
4. Cylinder
5. Cone
6. Hopper
7. Dust Pan
8. Funnel

SEMESTER : II
Subject Code : BE 201
Subject Title : Applied Mathematics - II
Structure of the Course Content

BLOCK 1 Vector Algebra

Unit 1: Introduction
Unit 2: Vector Properties
Unit 3: Product of Vectors
Unit 4: Application of Vectors

BLOCK 2 Integral Calculus

Unit 1: Integration
Unit 2: Standard Integrals
Unit 3: Integration by parts
Unit 4: Bernoulli's Theorem and Applications

BLOCK 3 Differentiation

Unit 1: Velocity and Acceleration
Unit 2: Tangents and Normals
Unit 3: Maxima and Minima
Unit 4: Partial differentiation

BLOCK 4 Application of Integration

Unit 1: Definite Integral.
Unit 2: Area and Volume
Unit 3: Solution of differential equations
Unit 4: Second order differential equation with constant coefficients

BLOCK 5 Probability Distributions

Unit 1: Continuous random variable
Unit 2: Discrete random variable
Unit 3: Discrete Distributions (Binomial, Poisson)
Unit 4: Continuous Distribution

Books :

1. Engineering Mathematics by Dr M.K.Venkatraman, National Publishing Co.
2. Engineering Mathematics by Dr P.Kandasamy, S.Chand & Co, New Delhi
3. Higher Engineering Mathematics by Ramana, Tata McGraw Hill, New Delhi
4. Engineering Mathematics by Singh, Tata McGraw Hill, New Delhi
5. Advanced Engineering Mathematics by N.Bali,M.Goyal,C.Watkins,Lakshmi Publications (Pvt) Ltd, New Delhi
6. Engineering Maths by T.Veerarajan, Tata McGraw Hill, New Delhi
7. Schaum's Outline of Technical Mathematics by Paul Calter, Tata McGraw Hill, New Delhi
8. Engineering Mathematics Vol-III by Dr. B. Krishna Gandhi , Dr. T.K.V Iyengar, S.Ranganatham, , S.Chand & Co, New Delhi
9. Introduction to Engineering Mathematics by H.K. Dass, Dr.Rama Verma, S.Chand & Co, New Delhi
10. Applied Engineering Mathematics Vol-II by H.K.Dass, S.Chand & Co

SEMESTER : II
Subject Code : BE 202
Subject Title : Engineering Physics - II
Structure of the Course Content

BLOCK 1 Heat

Unit 1: Heat - Kinetic Theory of Gases:
Unit 2: Specific Heat
Unit 3: Isothermal Changes
Unit 4: Adiabatic Changes

BLOCK 2 Gases & Non Conversional Energy

Unit 1: Liquefaction of Gases
Unit 2: Joule Thomson Effect & Linde's process
Unit 3: Renewable and Non-renewable sources
Unit 4: Alternate sources of Energy-

BLOCK 3 Light & Magnetism

Unit 1: Optical Instruments
Unit 2: Lasers
Unit 3: Basic definitions of Magnetism
Unit 4: Hysteresis Loop

BLOCK 4 Electricity

Unit 1: Basic laws
Unit 2: Force on a moving charge
Unit 3: Measuring Instruments
Unit 4: Heating Effect of Electric Current

BLOCK 5 Dielectric effect & Electronics

Unit 1: Chemical Effect of Electric Current
Unit 2: Capacitor
Unit 3: Semiconductors , PN Junction & Transistors
Unit 4: Logic Gates

Books :

1. Physics by Resnick and Hoilday ,Wisley Toppan Publishers – England
2. Mechanics by Narayana Kurup , S. Chand Publishers – New Delhi
3. Engineering Physics by B.L. Theraja , S. Chand Publishers – New Delhi
4. Remote sensing by Dr.M.Anji Reddy, Jawaharlal Nehru Technological University –Hyderabad.
5. Engineering Physics by V.Rajendran, Tata McGraw Hill, New Delhi
6. Engineering Physics by Vikram Yadav, Tata McGraw Hill, New Delhi
7. Schaum's Outline of Physics for Engineering and Science by Michael Browne, Tata McGraw Hill, New Delhi
8. Modern Engineering Physics by A.S.Vasudeva, S. Chand Publishers, New Delhi
9.Engineering Physics Fundamentals & Modern Applications by P.Khare and A.Swarup, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Engineering Physics by Dipak Chandra Ghosh,Nipesh Chandra Ghosh,Prabir Kumar Haldar, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : II
Subject Code : BE 203
Subject Title : Applied Chemistry - II
Structure of the Course Content

BLOCK 1 Nuclear Chemistry

Unit 1: Radio activity and definitions
Unit 2: Half life period & Nuclear fission & fusion
Unit 3: Applications of radioactive isotopes
Unit 4: Abrasives

BLOCK 2 Fuels and Refractory's

Unit 1: Fuels - classification
Unit 2: Solid and Liquid Fuels
Unit 3: Gas Fuels
Unit 4: Refractory's

BLOCK 3 Water Treatment

Unit 1: Water Treatment Methods
Unit 2: EDTA Method
Unit 3: Water -purification
Unit 4: Lime and manufacturing process

BLOCK 4 Plastics and Rubber

Unit 1: Thermoplastics,
Unit 2: Thermo set plastics
Unit 3: Natural rubber-
Unit 4: Synthetic rubber

BLOCK 5 Metallurgy

Unit 1: Tungsten &Titanium
Unit 2: Powder metallurgy
Unit 3: Purpose of alloying
Unit 4: Non ferrous alloys

Books :

1. Inorganic chemistry by Soni PL, Sultan Chand &sons.
2. Organic chemistry by Soni PL, Sultan Chand & sons.
3. Engineering chemistry by Jain & Jain, Dhanpat rai &co
4. Engineering chemistry by Uppal , Khanna publishers
5. Environmental chemistry &Pollution control by Dara .SS, S. Chand&co
6. Environmental Pollution by . Tripathy .SN , Sunakar panda - Vrinda publication
7. Rain water Harvesting-hand book by Chennai Metro Water
8. Introduction to Engineering Chemistry by Minaxi B Lohani, Upma Misra, S.Chand & Co, New Delhi
9. Engineering Chemistry by Dr.A.K.Pahari,Dr.B.S.Chauhan, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Advanced Engineering Chemistry by M.Senapati, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : II
Subject Code : BE 204
Subject Title : Engineering Graphics
Structure of the Course Content

BLOCK 1 Drawing Office Practice

Unit 1: Basics of Engg Drawing
Unit 2: Dimensioning
Unit 3: Scales
Unit 4: Geometrical Constructions, conics and geometrical curves

BLOCK 2 Projection

Unit 1: Orthographic Projection
Unit 2: Projection of simple solids
Unit 3: Section of Solids
Unit 4: Half & Full Sectioning

BLOCK 3 Pictorial drawings

Unit 1: Introduction
Unit 2: Isometric Drawings
Unit 3: Conversion of orthographic views

BLOCK 4 Development of Surfaces:

Unit 1: Cube, Cylinder
Unit 2: Prism
Unit 3: Pyramids
Unit 4: Tee and Elbow

BLOCK 5 AutoCAD

Unit 1: Introduction
Unit 2: AutoCAD commands
Unit 3: Drawing -line, circle, arc, polygon,
Unit 4: Drawing - ellipse, rectangle

Books :

1. Engineering Drawing by Gopalakrishnan.K.R., (Vol.I and Vol.II), Dhanalakshmi publishers, Edition 2, 1970
2. First Year Engineering Drawing by Barkinson & Sinha, Pitman Publishers, London, Edition 3, 1961
3. A Book on AutoCAD Release 2007.
4. Engineering Drawing by Shah/Rana,Ist Edition Pearson Longman
5. Machine Drawing with AutoCAD by Pohit/Ghosh, Ist Edition Pearson Longman
6. Engineering Graphics by Prof.P.J.Shah, S.Chand & Co, New Delhi
7. Computer Graphics including CAD,AUTOCAD &C by A.M.Kuthe, S.Chand & Co, New Delhi
8. Engineering Graphics by Dhawan R.K, S.Chand & Co, New Delhi
9. Auto CAD 2005 for Engineers by Ionel Simon, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Engineering Drawing by Agrawal, Tata McGraw Hill, New Delhi

Drawing Practices

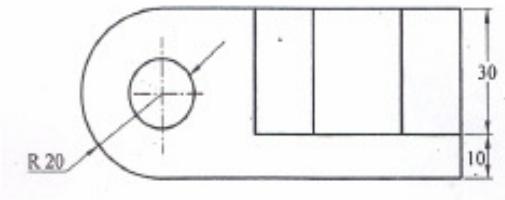


Fig – 1

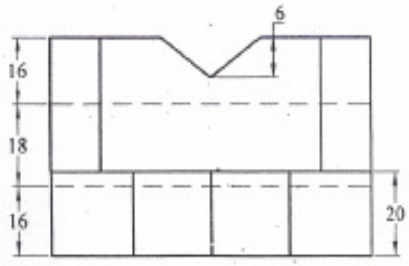


Fig- 2

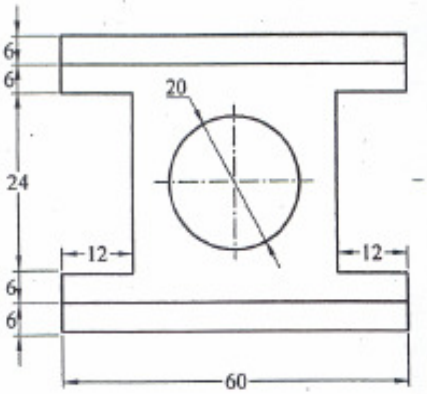


Fig. 3

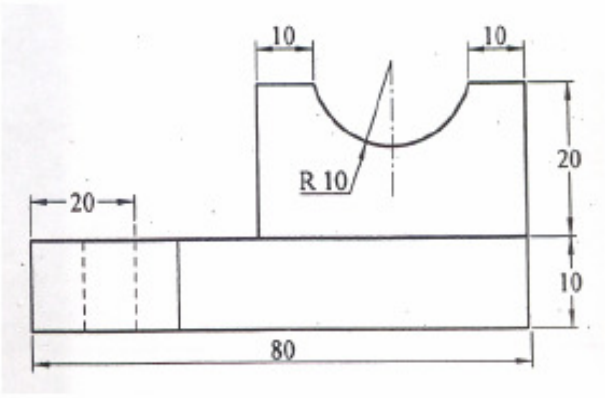


Fig. 4

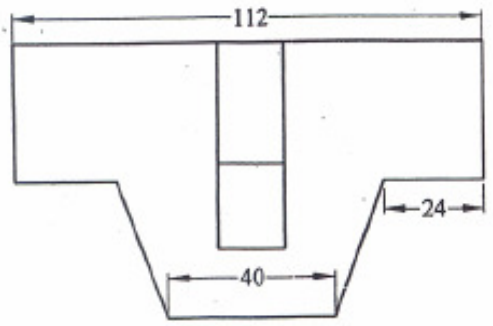


Fig. 5

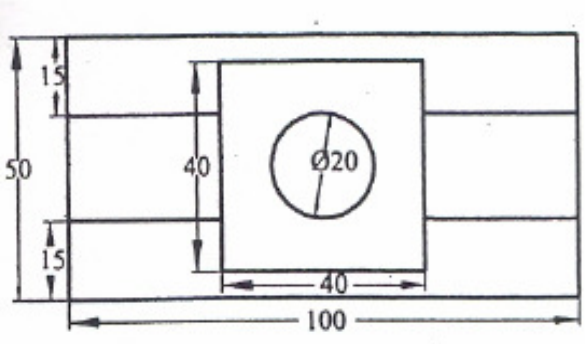


Fig. 6

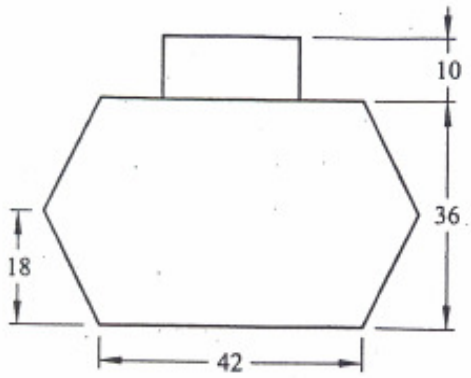


Fig. 7

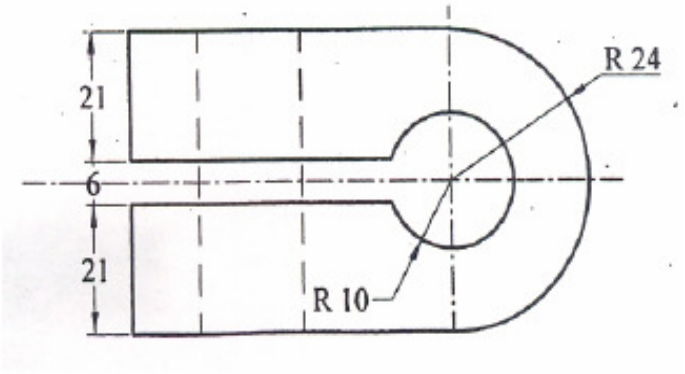


Fig. 8

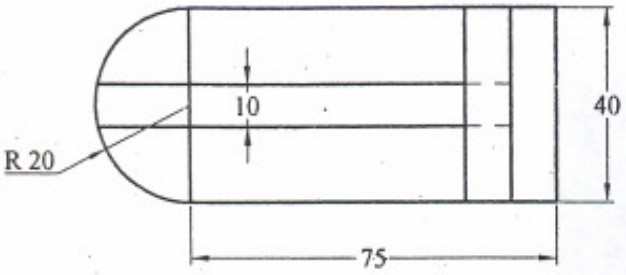


Fig. 9

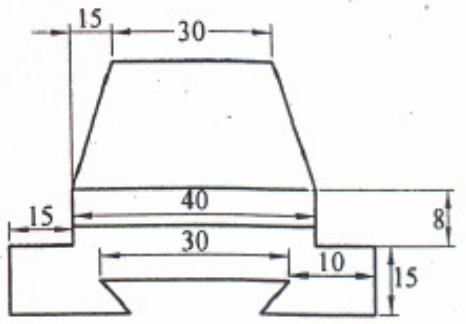


Fig. 10

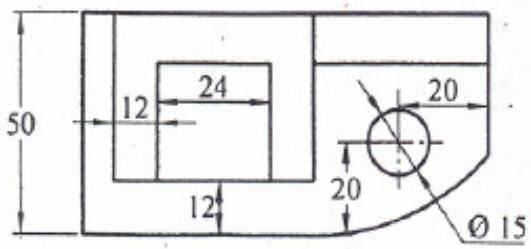


Fig.11

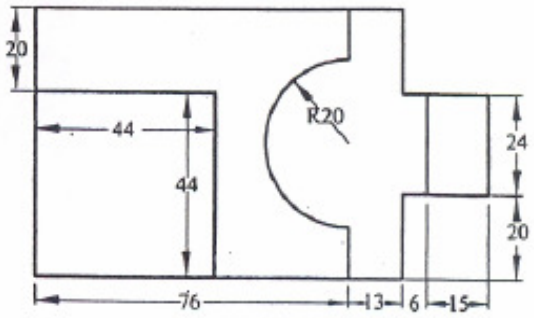


Fig. 12

SEMESTER : II

Subject Code : BE 205

Subject Title : Engineering Physics Lab

List of Experiments

1 VERNIER CALIPERS - To find the volumes of the solid cylinder and hollow cylinder using vernier callipers.

2 SCREW GAUGE – To find the thickness of (a) glass plate (b) given sphere using screw gauge. Hence calculate the volume of the glass plate and the sphere.

3 SIMPLE PENDULUM – To find the acceleration due to gravity in the laboratory, using simple pendulum. Calculate the acceleration due to gravity, by L–T^2 graph.

4 CONCURRENT FORCES -To verify the parallelogram law of forces and Lami's theorem.

5 COPLANAR – PARALLEL FORCES – To verify the conditions of the Co-planar parallel forces.

6 TORSION PENDULUM – To find the rigidity modulus of the thin wire and moment of inertia of the disc by using symmetric masses.

7 COMPARISON OF VISCOSITIES – To compare the coefficient of viscosities of two liquids by capillary flow method.

8 VISCOSITY OF A HIGHLY VISCOUS LIQUID – To find the coefficient of viscosity of a highly viscous liquid.

9 SURFACE TENSION: To find the surface tension of the given liquid by capillary rise method

10 YOUNG'S MODULUS – To find the young's modulus of the material of the given metre

scale.

11 SPECTROMETER – 1. To find the angle of the prism.

12 SPECTROMETER – 2. To find the refractive index of the material of the prism.

13 DEFLECTION MAGNETOMETER – To compare the magnetic moments of two given magnets by (a) Equal distance method and (b) Null method.

14 SONO METER – To find the frequency of the given tuning fork.

15 JOULE'S CALORIMETER – To determine the specific heat capacity of the given liquid.

16 COPPER VOLTAMETER – To determine electro – chemical – equivalent of copper.

17 OHM'S LAW – To determine the resistance of two given coils of wire using Ohm's law. Also verify the laws of resistances.

18 POTENTIO METER – To compare the e.m.fs of two given cells.

19 PN JUNCTION DIODE – For the given semiconductor diode draw (a) Forward bias (b) Reverse bias characteristic curves.

20 SOLAR CELLS – V. I. Characteristics.

SEMESTER : II

Subject Code : BE 206

Subject Title : Applied Chemistry Lab

List of Experiments

1.Qualitative Analysis

Acid radicals : Chloride, Carbonate, Sulphate, Nitrate

Basic radicals: Lead, Cadmium, Copper, Aluminium, Zinc, Calcium, Magnesium, Ammonium

Identification of acid and basic radicals in

1. Lime Stone (Calcium Carbonate)
2. Pollutant (Lead nitrate or Cadmium Carbonate)
3. Fertilizer(Ammonium sulphate)
4. Electrolyte(Ammonium Chloride)
5. Fungicide(Copper sulphate)
6. Coagulant(Aluminium Sulphate)
7. Mordant(Zinc Sulphate)
8. Gypsum(Calcium Sulphate)
9. Epsum(Magnesium Sulphate)
10. Analysis of an Effluent (containing pollutants like Lead, Cadmium, Zinc, and Copper).Students may be given above four pollutants , in four separate test tubes in solution form and asked to report metallic pollutants with procedure (Basic Radical Analysis Procedure) and their harmful effects.

2. VOLUMETRIC ANALYSIS (DOUBLE TITRATIONS)

ACIDIMETRYAND ALKALIMETRY

1. Estimation of Hydrochloric acid
2. Estimation of Sodium Hydroxide
3. Estimation of Sodium Carbonate
4. Comparison of Strengths of two bases

PERMANGANIMETRY

5. Estimation of Ferrous Ammonium Sulphate
6. Estimation of Ferrous Sulphate
7. Comparison of Potassium Permanganate.

WATER ANALYSIS

8. Estimation of Total Hardness by EDTA method.
9. Calculation of pH of four sample solutions and calculation of H+ Ion concentration for a particular sample solution.

Subject Code : AE 301
Subject Title : Engineering Mechanics
Structure of the Course Content

BLOCK 1 Mechanical Properties of Materials

Unit 1: Basic Definitions
Unit 2: Stress
Unit 3: Strain
Unit 4: Stress-Strain Calculations

BLOCK 2 Geometrical Properties of Sections

Unit 1: Basic Definitions
Unit 2: Moment of Inertia
Unit 3: Thin cylinders
Unit 4: Thin Spherical Shells

BLOCK 3 Theory of Simple Bending

Unit 1: Shear Force
Unit 2: Bending Moment
Unit 3: Cantilever
Unit 4: Simple Bending

BLOCK 4 Torsion and Springs

Unit 1: Theory of Torsion
Unit 2: Tortional Rigidity
Unit 3: Hollow Shaft
Unit 4: Springs

BLOCK 5 Deflection

Unit 1: Beams
Unit 2: Friction
Unit 3: Gear Drives
Unit 4: Belt Drives

Books :

1.Applied Mechanics by A.K.Upadhyay, Charotar Publishers
2.Strength of Materials by R.S.Khurmi, S.Chand & Co
3.Applied Mechanics by SB Junnarkar, Dr. HJ Shara, Charator publishing house, Anand 388001
4. Strength of Materials by S. Ramamrutham Dhanpat Rai Pub. Co, New Delhi.
5. Strength of Materials by L.Negi, Tata McGraw Hill, New Delhi
6. Schaum's Outline Of Statics and Mechanics of Materials by William Nash, Tata McGraw Hill, New Delhi
7. Mechanics of Materials by Ferdinand Beer.E, Russell Johnson, Jr John DeWolf.David Mazurek, Tata McGraw Hill, New Delhi
8. Strength of Materials by S.Rattan, Tata McGraw Hill, New Delhi
9. Strength of Materials by B.Sarkar, Tata McGraw Hill, New Delhi
10. Mechanics of Materials by Ansel Ugural, Tata McGraw Hill, New Delhi

SEMESTER : III
Subject Code : AE 302
Subject Title : Manufacturing Technology - I
Structure of the Course Content

BLOCK 1 Foundry

Unit 1: Patterns
Unit 2: Moulding
Unit 3: Casting
Unit 4: Furnace

BLOCK 2 Forging and Welding

Unit 1: Hot Working operation
Unit 2: Welding
Unit 3: Types of Welding
Unit 4: Types of Testing

BLOCK 3 Powder Metallurgy and Heat Treatment

Unit 1: Methods of Manufacturing
Unit 2: Metallurgy
Unit 3: Heat Treatment
Unit 4: Hardening

BLOCK 4 Lathe

Unit 1: Simple Lathe
Unit 2: Semi Automatic Lathe
Unit 3: Fully Automatic Lathe
Unit 4: Multi Spindle Automatic Lathe

BLOCK 5 Metrology

Unit 1: Measuring Instruments
Unit 2: Marking Instruments
Unit 3: Comparators
Unit 4: Gauges

Books :

1. R.S. Khurmi & J.K. Gupta, A Text Book of workshop Technology, Edn.2, S.Chand & Co., New Delhi
2. Begeman, Manufacturing Process, Edn.-5, TMC, New Delhi.
3. Elements of workshop Technology Volume I & II, Edn by Hajra Chowdry & Bhattacharaya,
   Media Promoters & Publishers Pvt. Ltd., Mumbai
4. Workshop Technology, Volume I, II, & III by WAJ Chapman, Vima Books Pvt.Ltd., New Delhi
5. Workshop Technology by Raghuwanshi, Khanna Publishers
6. Production Technology, Edn. XII, by Jain & Gupta, Khanna Publishers
7. Production Technology, Edn. X by P. C. SHARMA, S.Chand & Co. Ltd., Ram Nagar, New Delhi
8. Production Technology, Edn. 18 by HMT, Tata McGraw Hill
9. Manufacturing Engineering & Technology by Kalpakjian, Tata McGraw Hill
10. A Text Book of Manufacturing Technology by R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi

SEMESTER : III
Subject Code : AE 303
Subject Title : Fluid Mechanics
Structure of the Course Content

BLOCK 1 Properties of Fluids

Unit 1: Basic Definition
Unit 2: Pressure measurement
Unit 3: Mechanical Gauges
Unit 4: Diaphragm Pressure gauge

BLOCK 2 Flow of Fluids

Unit 1: Type of Fluids
Unit 2: Bernoulli's Theorem
Unit 3: Orifice Meter
Unit 4: Venturi Meter

BLOCK 3 Jets and Pumps

Unit 1: Impact of Jets
Unit 2: Turbine
Unit 3: Types Turbines
Unit 4: Pumps

BLOCK 4 Pneumatic Systems

Unit 1: Basics of Pneumatic systems
Unit 2: Flow Control Valve
Unit 3: FRL Unit
Unit 4: Application of Pneumatic Systems

BLOCK 5 Hydraulic Systems

Unit 1: Basics of Hydraulic Systems
Unit 2: Accumulator
Unit 3: Fluid Power Pump
Unit 4: Application of Hydraulic Systems

Books :

1. A Text Book of Hydraulics, Fluid Mechanics by R.S. Khurmi, S.Chand & Co, New Delhi
2. A Text Book of Hydraulics R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi
3. Hydraulic Machines by Jagadishlal, Metropolitan Book Co, New Delhi
4. Fluid Mechanics and Hydraulic Machines , Edn. 8 by R.K.Bansal, Lakshmi Publications Pvt Ltd, New Delhi
5. Hydraulics and Pneumatics (A Technician's and Engineer's Guide) by Andrew Parr
6. Fundamentals of Pneumatic control Engineering by FESTO manual
7. Text book of Hydraulics by H. Meixner and R.Kober , FIESTO DIDACTIC KG, D 7300 Esslingen
8. Fluid Mechanics and Hydraulic Machines by T.S.Desmukh, Lakshmi Publications Pvt Ltd, New Delhi
9. Fluid Mechanics by Cengel, Tata McGraw Hill
10. Fluid Mechanics and Machinery by Rao, Tata McGraw Hill

SEMESTER : III
Subject Code : AE 304
Subject Title : Machine Drawing
Structure of the Course Content

BLOCK 1 Section Views

Unit 1: Need Sectioning
Unit 2: Hatching
Unit 3: Half Sectioning and full sectioning
Unit 4: Removed and offset sections

BLOCK 2 Limits, Fits and Tolerances

Unit 1: Basic Definitions
Unit 2: Limits
Unit 3: Fits
Unit 4: Tolerances

BLOCK 3 Keys and Surface finish

Unit 1: Basic Definitions
Unit 2: Types of Keys
Unit 3: Design of shaft and keys
Unit 4: Indication of surface roughness

BLOCK 4 Threads and Fasteners

Unit 1: Basic Definition
Unit 2: Types of Threads
Unit 3: Types of Bolts and nuts
Unit 4: Types of Rivets

BLOCK 5 CAD Drawings

Unit 1: AutoCAD Theory
Unit 2: Sleeve and Cotter Joint
Unit 3: Machine Vice
Unit 4: Screw Jack

Books :

1. Machine Drawing, Edn.37 by N.D.Bhatt, Charotar Publishing House
2. Engineering Drawing by R.C.Parkinson, Published by English University Press, London
3. Engineering Drawing by K. R. Goplakrishnan, Dhanalakshmi Publishers, Chennai
4. A First year Engineering Drawing. First Rep 1982 by A. C. Parkinson, A.H. Wheeler & Company (P) Ltd, Allahabad
5. Machine Drawing by Sidheswar Tata McGraw Hill
6. Machine Drawing by Singh Tata McGraw Hill

SEMESTER : III

Subject Code : AE 305

Subject Title : Engineering Mechanics Lab

Laboratory Experiments :

1. Test on Ductile Materials
2. Hardness Test
3. Torsion test
4. Bending and deflection tests
5. Impact test
6. Tests on springs of circular section
7. Shear test
8. Verifying the Bernoulli's Theorem
9. Determination of Coefficient of discharge of a Venturimeter
10. Determination of Coefficient of discharge of a Orifice meter
11. Performance test on a reciprocating pump
12. Performance test on a centrifugal pump
13. Performance test on an impulse turbine
14. Performance test on a reaction turbine

SEMESTER : III

Subject Code : AE 306

Subject Title : Workshop –I

Structure of the Course Content

Smithy :

Exercises:

1. Round rod to hexagonal rod
2. Round rod to square rod
3. Round rod to square headed bolt
4. Round rod to 'S' Shape
5. Round rod to flat with 25mm

Foundry :

Exercises:

Preparation of sand mould:
6. Solid pattern
   a. Stepped Pulley
   b. Bearing top
   c. Gear Wheel
   d. T-pipe
7. Split pattern
   a. Bent Pipe
   b. Dumbles
8. Loose Piece Pattern- Dowtail
9. Cylindrical core making
10. Melting and casting

Welding :

Exercises:
11. Arc welding
   a. Lap joint (Material: 25mm x 3mm Ms Flat)
   b. Butt joint (Material: 25mm x 6mm Ms Flat)
   c. T-joint (Material: 25mm x 3mm Ms Flat)
   d. Corner joint (Material: 25mm x 3mm Ms Flat)
12. Gas Welding
   a. Lap joint (Material: 25mm x 3mm Ms Flat)
   b. Butt Joint (Material: 25mm x 6mm Ms Flat)
13. Gas cutting: Profile cutting.
14. Spot welding-Lap joint(18/20swg)
15. Demonstration of Soldering and brazing

SEMESTER : IV
Subject Code : AE 401
Subject Title : Thermodynamics
Structure of the Course Content

BLOCK 1 Thermodynamics and Expansion of Gases

Unit 1: Basic Definitions
Unit 2: Steam Properties
Unit 3: Gas Properties
Unit 4: Law of Perfect Gases

BLOCK 2 Steady flow energy equation and Air Cycles

Unit 1: Steady flow system
Unit 2: Steam Boilers
Unit 3: Air Cycles
Unit 4: P-V Diagram

BLOCK 3 Internal Combustion engines

Unit 1: Diesel Engines
Unit 2: Petrol Engines
Unit 3: Ignition Systems
Unit 4: Lubrication Systems

BLOCK 4 Fuels & Performance of I.C.Engines

Unit 1: Classification of fuels
Unit 2: Performance of IC Engines
Unit 3: Break power calculation
Unit 4: Morse test

BLOCK 5 Air Compressors

Unit 1: Basic Definition
Unit 2: Types of Compressor
Unit 3: Working Principle of Compressor
Unit 4: Problems

Books :

1. Thermal Engineering, Edn. 18 by R.S.Khurmi and J.K. Gupta, published by S.Chand & Co
2. Applied Thermodynamics, Edn.24 by P.K.Nag, , TMC, and New Delhi.
3. Applied Thermodynamics by R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi
4. A Text Book of Internal Combustion Engines by R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi
5. A Text Book of Engineering Thermodynamics by R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi
6. Thermal Science and Engineering by R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi
7. Thermal engineering, Edn. 24 by P.L Ballaney, Khanna Publishers, New Delhi
8. Thermal engineering, Edn. 3 by B.K Sarkar, Dhanpat Rai &Sons, New Delhi
9. Applied Thermodynamics, Edn. 2 by Domkundwar and C.P kothandaraman, Khanna Publishers, New Delhi
10. Thermal Engineering by R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi

SEMESTER : IV
Subject Code : AE 402
Subject Title : Manufacturing Technology -II
Structure of the Course Content

BLOCK 1 Planer, Shaper and Slotter

Unit 1: Planer
Unit 2: Shaper
Unit 3: Slotter
Unit 4: Jig and fixtures

BLOCK 2 Drilling Machines and Milling Machines

Unit 1: Types of Drilling Machines
Unit 2: Types of Drilling Operations
Unit 3: Types of Milling Machines
Unit 4: Types of Milling Operations

BLOCK 3 Grinding, Broaching & Boring

Unit 1: Types of Grinding Machines
Unit 2: Principle and Operation of Grinding Machines
Unit 3: Broaching
Unit 4: Boring

BLOCK 4 Gear Manufacturing

Unit 1: Gear Manufacturing in Milling operation
Unit 2: Gear Manufacturing in Shaping operation
Unit 3: Milling Procedure for Spur Gear
Unit 4: Milling Procedure for Helical & bevel gears

BLOCK 5 Jigs and Fixtures and Press works

Unit 1: Jigs
Unit 2: Fixtures
Unit 3: Mechanical Press
Unit 4: Hydraulic Press

Books :

1. Hajra Choudry & Battacharya, Elements of Workshop Technology-Vol-I & II, Edn. 11, Mumbai.
2. Jain & Gupta, Production Technology, Khanna Publishers, New Delhi.
3. Production Technology, Edn. 18 by HMT, Tata McGraw Hill, New Delhi
4. Manufacturing process, Edn. 5 by Myro N Begman, Tata McGraw Hill, New Delhi
5. Workshop Tech Vol I,II, III by WAJ. Chapman, Viva Books Pvt. Ltd, New Delhi
6. Production processes by NITTTR, Tata McGraw Hill Publishing Co, New Delhi
7. Manufacturing Technology-II by Dr.R.Kesavan,B.Vijaya Ramnath, Lakshmi Publications Pvt Ltd, New Delhi
8. Manufacturing Engineering & Technology by Kalpakjian, Tata McGraw Hill
9. A Text Book of Manufacturing Technology by R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi
10. R.S. Khurmi & J.K. Gupta, A Text Book of workshop Technology, Edn.2, S.Chand & Co., New Delhi

SEMESTER : IV
Subject Code : AE 403
Subject Title : Automobile Electrical & Electronics
Structure of the Course Content

BLOCK 1 Basic Electrical and Electronics

Unit 1: Basic Laws
Unit 2: Series, Parallel connections
Unit 3: DC Motors and DC Generators
Unit 4: Basic Electronics

BLOCK 2 Automobile Electrical system

Unit 1: Battery
Unit 2: Generator
Unit 3: Alternator
Unit 4: Regulator

BLOCK 3 Starting motor and drive Mechanism

Unit 1: Starting motor Working Principle
Unit 2: Starting motor drive mechanism
Unit 3: Bendix Drive Mechanism
Unit 4: Electric Starting circuits in two wheelers

BLOCK 4 Ignition System

Unit 1: Battery coil ignition
Unit 2: Distributor spark plug
Unit 3: Magneto ignition
Unit 4: Electronic ignition system

BLOCK 5 Lighting and Accessories

Unit 1: Head Lamp Beam setting
Unit 2: Horn
Unit 3: Suppressors
Unit 4: Wind screen wipers

Books :

1. Modem Electrical Equipment of Automobiles by JUDGE A.W, Chapman & Hall
2. Automobile Electric equipments by Crouse WH, MC Graw Hill Book & co
3. Automobile Electrical Equipments by Young & Griffiths, ELBS
4. Automobile Transmission and Power Systems, by William.H.Grouse.
5. Automobile Engineering by Narang. G.B.S., Khanna Publishers, New Delhi.
6. Automotive Engineering by Kirpal Singh, Standard Publishers, New Delhi
7. Automobile Engineering by Banga and Singh, Khanna Publishers, New Delhi
8. Motor vehicle technology and practical work by Dolan.J.A, ELBS
9. Automobile Mechanics by Dr.Giri.N.K, Khanna Publishers, New Delhi
10. Automotive Electrical Equipment by Kohli,TMC, New Delhi

SEMESTER : IV
Subject Code : AE 404
Subject Title : Automobile Chassis
Structure of the Course Content

BLOCK 1 Clutch Mechanism

Unit 1: clutch actuating mechanism
Unit 2: Mechanical and hydraulic types
Unit 3: Types Dry Clutches
Unit 4: semi centrifugal and centrifugal clutch motor cycle clutch

BLOCK 2 Gear Box Mechanism

Unit 1: ppurpose of Gear box
Unit 2: Tractive effort in Gear box
Unit 3: Gradient resistance in gear box
Unit 4: Gear shifting mechanism

BLOCK 3 Shaft Mechanisms

Unit 1: Universal Joints
Unit 2: Bendix Weiss type
Unit 3: Propeller shaft
Unit 4: Centre joint

BLOCK 4 Axle Mechanism

Unit 1: Front axle
Unit 2: Rear Axle
Unit 3: Differential Axle
Unit 4: Live and Dead Axle

BLOCK 5 Suspension Systems

Unit 1: Basics of Suspension system
Unit 2: Shock Absorber
Unit 3: Air suspension
Unit 4: Leaf spring

Books :

1. Automobile Transmission and Power Systems, by William.H.Grouse.
2. Automobile Engineering by Narang. G.B.S., Khanna Publishers, New Delhi.
3. Automobile Electrical Equipments by William.H.Grouse
4. Automotive Engineering by Kirpal Singh, Standard Publishers, New Delhi
5. Automobile Engineering by Banga and Singh, Khanna Publishers, New Delhi
6. Motor vehicle technology and practical work by Dolan.J.A, ELBS
7. Automobile Mechanics by Dr.Giri.N.K, Khanna Publishers, New Delhi
8. Automotive Mechanics, Edn. 6 by Srinivasan, McGraw Hill Co., New York
9. Automotive Electrical Equipment by Kohli,TMC, New Delhi
10. Automotive Mechanics by Crouse, McGraw Hill Co

SEMESTER : IV
Subject Code : AE 405
Subject Title : Automobile Electrical & Electronics Lab.

List of Experiments:

Part A

1. Study of General Electrical System in an Automobile.
2. Removing and REPLACING a BATTERY from a car.
3. TESTING THE BATTERY: Hydrometer Test – Open Circuit Voltage and High Rate Discharge Testing.
4. Study of the Battery Charger and Charging the Run Down Battery.
5. Identification of Various components of Ignition system, Dismantling Assembly of a Distributor, Setting Contact Breaker Points and Servicing of Spark Plugs.
6. Setting Ignition Timing with Timing Light and Start the engine.
7. Dismantling and Overhauling of a Starter Motor.
8. Dismantling and Overhauling of a Dynamo.
9. Dismantling and Overhauling of an Alternator.
10. Servicing of Regulator.
11. Adjusting the Sealed Beam Head Lamp.
12. Servicing and tune up of the Horn.
13. Servicing a Wiper Motor.

Part B

14. Study of BASIC ELECTRONICS (Semi Conductor Materials – N type and P type PN junction – forward and reverse bras, characteristics of PN diode – Half wave rectifier full wave rectifier bridge rectifier, zener and avalanche break – down, Characters of Zener diode – application of Zener diode).
15. Construction of a half wave rectifier without filter.
16. Construction of a bridge wave rectifier without a filter.
17. Measurement of voltage, current and resistance by using multimeter (both analog and digital) in all ranges.
18. Verification of truth table for AND, OR, NOT, NOR, NAND, EX OR, and EX NOR gates

SEMESTER : IV
Subject Code : AE 406
Subject Title : Workshop –II
Structure of the Course Content
Syllabus:

1. Introduction of safety in operating machines.

2. Introduction to lathe, drilling machine & shaping machine and its parts.

3. Introduction to work holding devices and tool holding devices.

4. Types of tools used in lathe work, drilling & shaping.

5. Types of measuring instruments and their uses.

6. Setting of work and tools.

7. Operation of lathe, drilling & shaping.

8. Practice on a lathe, drilling and shaping machine

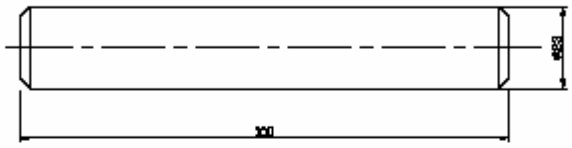
Note: The dimensions may be modified according to the materials specified.

Enclosure: Sketches of Lathe, drilling & shaping Exercises.

LATHE

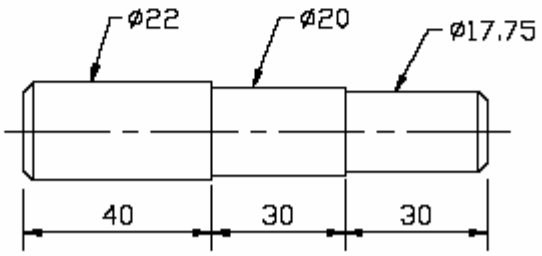
1.0 LATHE

EX.NO.1 PLAIN TURNING

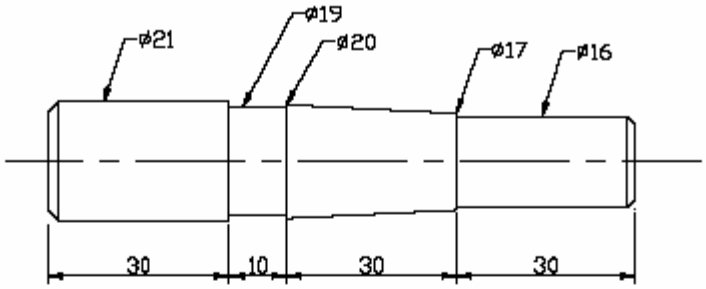


MATERIAL:M.S. OF SIZE DIA
25X105mm.

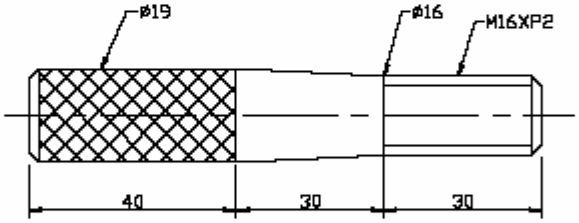
EX.NO.2 STEP TURNING



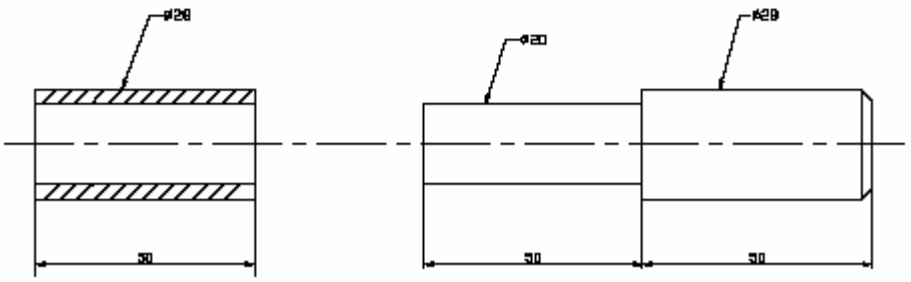
EX.NO.3 TAPER TURNING



EX.NO.4 THREAD CUTTING AND KNURLING



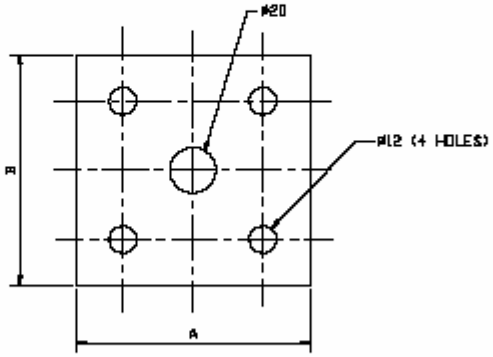
EX.NO.5 BUSHING



DRILLING

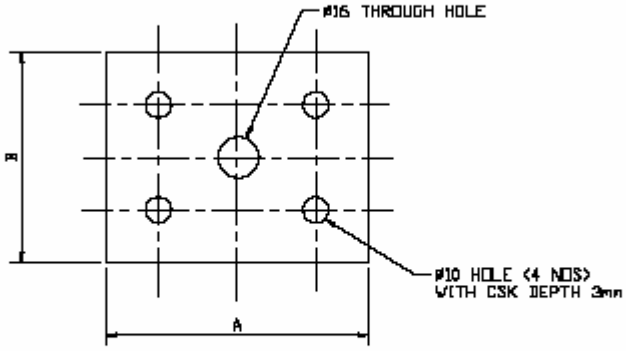
2.0 DRILLING

EX.NO1 THROUGH HOLE DRILLING



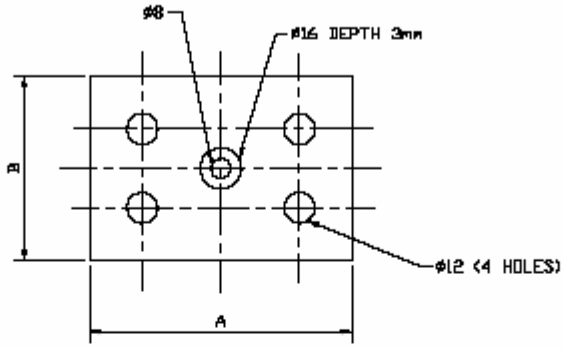
MATERIAL:M.S. OF SIZE 75X50X6mm.

EX.NO.2 THROUGH HOLE DRILLING WITH COUNTER SUNK



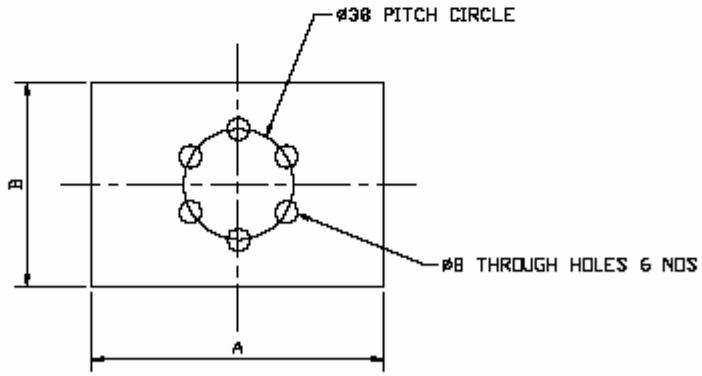
MATERIAL:M.S. OF SIZE 75X50X6mm.

EX.NO.3 PART DRILLING



MATERIAL:M.S. OF SIZE 75X50X6mm.

EX.NO.4 THROUGH HOLE DRILLING (ON PITCH CIRCLE)

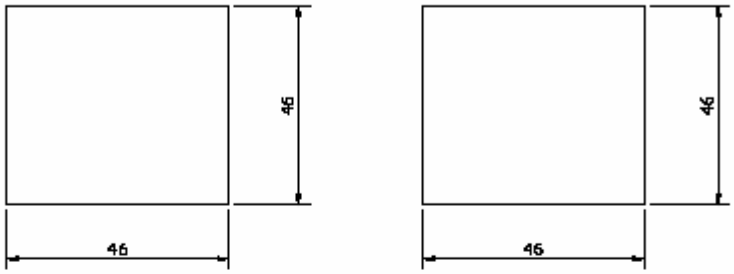


MATERIAL:M.S. OF SIZE 75X50X6mm.

SHAPING

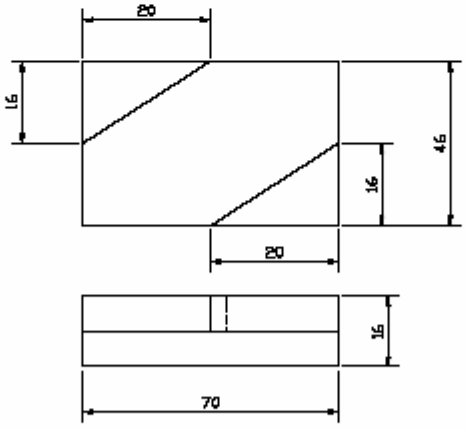
3.0 SHAPING

EX.NO.1 MACHINING FLAT SURFACE USING A SHAPER



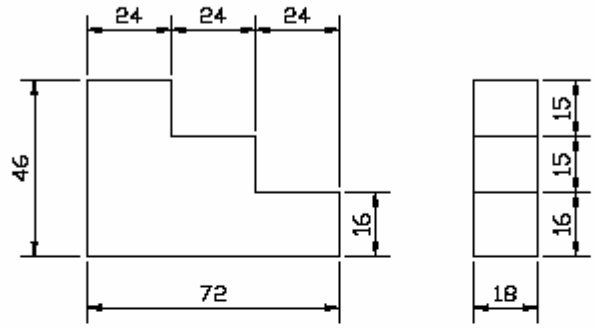
MATERIAL:C.I. OF SIZE 50X50X50mm.

EX.NO.2 CROSS CUT MACHNINING USING SHAPER



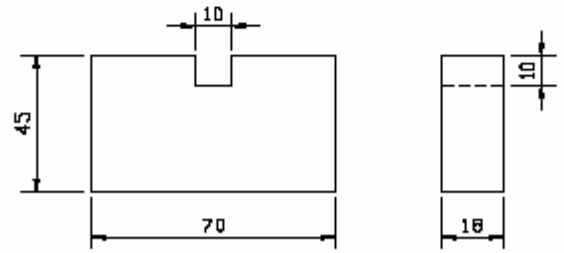
MATERIAL:C.I. OF SIZE 75X50X20mm.

EX.NO.3 MACHINIG A STEPPED BLOCK



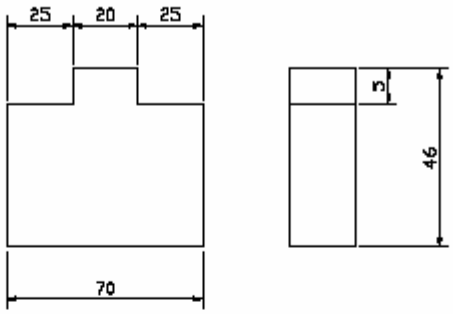
MATERIAL:C.I. OF SIZE 75X50X20mm.

EX.NO.4 SLOTTING USING A SHAPER



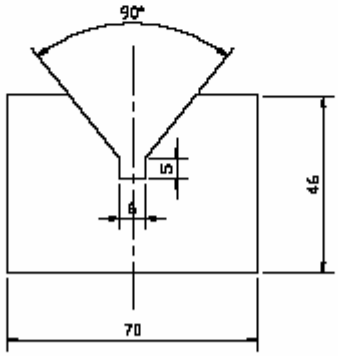
MATERIAL:C.I. OF SIZE 75X50X20mm.

EX.NO.5 SHAPING INVERTED 'T' BLOCK



MATERIAL:C.I. OF SIZE 75X50X20mm.

EX.NO.6 SHAPING A 'V' BLOCK



MATERIAL:C.I. OF SIZE 75X50X20mm.

SEMESTER : V
Subject Code : AE 501
Subject Title : Automobile Transmission
Structure of the Course Content

BLOCK 1 Steering system

Unit 1: Principle of steering
Unit 2: power steering
Unit 3: shock absorbers
Unit 4: Trouble shooting in suspension & steering systems

BLOCK 2 Brake Mechanisms

Unit 1: mechanical brake system
Unit 2: Hydraulic brake system
Unit 3: Air brake system
Unit 4: Brake drum and brake shoes

BLOCK 3 Tyre Mechanisms

Unit 1: Types of tyres
Unit 2: Types of tubes
Unit 3: Cross ply and radial ply
Unit 4: Tubeless tyres

BLOCK 4 Garage equipments

Unit 1: Power and machine tools
Unit 2: Compressor
Unit 3: Gauges
Unit 4: Wheel balancer

BLOCK 5 Servicing and Maintenance of Automobiles

Unit 1: Preventive maintenance
Unit 2: Brake drum servicing
Unit 3: Steering adjustment
Unit 4: Emission control

Books:

1. Automobile Transmission and Power Systems, by William.H.Grouse.
2. Automobile Engineering by Narang. G.B.S., Khanna Publishers, New Delhi.
3. Automobile Electrical Equipments by William.H.Grouse
4. Automotive Engineering by Kirpal Singh, Standard Publishers, New Delhi
5. Automobile Engineering by Banga and Singh, Khanna Publishers, New Delhi
6. Motor vehicle technology and practical work by Dolan.J.A, ELBS
7. Automobile Mechanics by Dr.Giri.N.K, Khanna Publishers, New Delhi
8. Automotive Mechanics, Edn. 6 by Srinivasan, McGraw Hill Co., New York
9. Automotive Electrical Equipment by Kohli,TMC, New Delhi
10. Automotive Mechanics by Crouse, McGraw Hill Co

SEMESTER : V
Subject Code : AE 502
Subject Title : Vehicle Body Technology
Structure of the Course Content

BLOCK 1 Car Body details

Unit 1: Types of car bodies
Unit 2: Estate van, racing car and sports car
Unit 3: Methods of improving visibility and space in cars
Unit 4: Safety equipments for car body construction

BLOCK 2 Bus Body Details

Unit 1: Types of bus bodies
Unit 2: Bus body lay out
Unit 3: Conventional and integral type construction
Unit 4: Modular construction

BLOCK 3 Vehicle Aerodynamics

Unit 1: Vehicle drag and types
Unit 2: Various types of forces and moments
Unit 3: Various body optimization techniques
Unit 4: Flow visualization techniques

BLOCK 4 Commercial Vehicle details

Unit 1: Different types of commercial vehicles
Unit 2: Constructional details of flat platform body
Unit 3: Tipper body and Tanker body
Unit 4: Drivers cab design

BLOCK 5 Body materials maintenance and surface finish

Unit 1: Steel sheet, Aluminium, timber, plastics
Unit 2: corrosion and Anti corrossion
Unit 3: Surface finish
Unit 4: Painting Process and Electroplating of component

Books:

1. Powloski J, Vehicle Body Engg, Business Books Ltd, 1989
2. John Fenton Vehicle Body Layout and analysis Mechanical Engg Publication Ltd
3. Body Construction & design Illiffe Books by Giles G.J., Butter worth & co
4. Automobile Transmission and Power Systems, by William.H.Grouse.
5. Automobile Engineering by Narang. G.B.S., Khanna Publishers, New Delhi.
6. Automobile Electrical Equipments by William.H.Grouse
7. Automotive Engineering by Kirpal Singh, Standard Publishers, New Delhi
8. Automobile Engineering by Banga and Singh, Khanna Publishers, New Delhi
9. Motor vehicle technology and practical work by Dolan.J.A, ELBS
10. Automobile Mechanics by Dr.Giri.N.K, Khanna Publishers, New Delhi

SEMESTER : V
Subject Code : AE 503
Subject Title : Two & Three Wheelers Technology
Structure of the Course Content

BLOCK 1 Power plant

Unit 1: Two stroke and four stroke SI engine
Unit 2: Lubrication system
Unit 3: Magneto coil and battery coil spark ignitions systems
Unit 4: Electronic ignition systems

BLOCK 2 Chassis and Sub system

Unit 1: Chassis and shaft drive
Unit 2: Single multiple plates and centrifugal clutches
Unit 3: Front and rear suspension systems
Unit 4: Shock absorbers

BLOCK 3 Brake and wheels

Unit 1: Drum brakes and Disc brakes
Unit 2: Front and Rear brakes links layouts
Unit 3: Spoked wheel and cast wheel
Unit 4: Disc Types and Tyres and Tubes

BLOCK 4 Two wheelers

Unit 1: Case study of Two Wheelers
Unit 2: Motor Cycles
Unit 3: Scooter and Moped
Unit 4: Servicing and maintenance

BLOCK 5 Three wheelers

Unit 1: Case study of Auto rickshaws
Unit 2: Pick up vans
Unit 3: Delivery Van and Trailer
Unit 4: Servicing and Maintenance

Books :

1. Irving P.E Motor Cycle Engineering. Temple Press Book London
2. Maintenance Manuals of Leading Two & Three Wheelers Manufacturers in India
3. The Cycle Motor manual Temple Press Ltd London
4. Motor vehicle technology and practical work by Dolan.J.A, ELBS
5. Automobile Mechanics by Dr.Giri.N.K, Khanna Publishers, New Delhi

SEMESTER : V
Subject Code : AE 504
Subject Title : Tractor & Farm Equipment Technology
Structure of the Course Content

BLOCK 1 General Design of Tractors and Accessories

Unit 1: Classification of Tractors
Unit 2: Main components of Tractor
Unit 3: Belt pulley
Unit 4: Power Tiller

BLOCK 2 Ploughing Implements

Unit 1: Primary and Secondary Tillage equipments
Unit 2: Tiller and Harrows
Unit 3: Mould Board Plough
Unit 4: Cage Wheel and its uses

BLOCK 3 Harvesting and Threshing Equipments

Unit 1: Harvesting
Unit 2: conventional and Modern Harvesters
Unit 3: Threshing
Unit 4: Principle of Paddy Threshers construction

BLOCK 4 Sprayers and Dusters

Unit 1: Classification of sprayers and dusters
Unit 2: Manual and Power sprayers
Unit 3: Sprayers and dusters
Unit 4: Different pumps, nozzles, used in sprayers

BLOCK 5 Maintenance of Tractors

Unit 1: Daily Maintenance of Tractors
Unit 2: Maintenance of Tractors on hour basis
Unit 3: Trouble shooting of Tractor engines
Unit 4: Major overhaul of engines

Books :

1. Elements of Agricultural Engineering by Jagdishwar Sahay
2. Farm Tractor – Maintenance and Repair by S.C.Jain, C.T.Raj, TATA MC Graw Hill
3. Farm Machinery and Equipment by Smith & Wilkey, Tata MC Graw Hill.
4. Farm Machinery by C.Culpin

SEMESTER : V

Subject Code : AE 505

Subject Title : Automobile Chassis & Transmission Lab

Part A

1. Removing and replacing of pressure plate and clutch plate, fingers adjustment and clutch plate relining.
2. Dismantling, inspecting and assembling of sliding mesh gear box and finding out the gear ratios.
3. Dismantling, inspecting and assembling of constant mesh gear box and finding out the gear ratios.
4. Dismantling, inspecting and assembling of synchromesh gear box and finding out the gear ratios.
5. Dismantling, inspecting and assembling of Epicyclic gear train gear box and finding out the gear ratios.
6. Dismantling and assembling of constant velocity universal joints. Rzeppa and Bendix Weiss joints.
7. Dismantling and assembling of rear axle. Wheel bearing adjustments.
8. Dismantling, assembling and adjusting of steering gearbox. Finding gear ratio.
9. Dismantling, assembling and adjusting of power steering.
10. Wheel alignment; checking, measuring and adjustment of castor, camber, king – pin inclination, toe – in and toe – out.

Part B

11. Removing and refitting of shock absorber.
12. Study of air suspension and its components.
13. Dismantling and assembling of leaf and coil spring.
14. Dynamic and static balancing of wheels.
15. Valcanizing of tubes and reconditioning of tyres.
16. Dismantling and assembling Dismantling, inspecting and assembling of final drive and differential units. Adjusting of backlash, tooth contact, pre-loading of bearing.
17. Overhauling, adjusting and bleeding of Hydraulic system.
18. Overhauling and adjusting of air brake system.
19. Clutch and brake pedal free play adjustments.
20. Adjust four-wheel drive mechanism for alignment.

SEMESTER : V

Subject Code : AE 506

Subject Title : Automobile Workshop

Part A

1. Milling different types of key-ways.
2. Milling splines on the shaft.
3. Milling Bevel gear.
4. Milling T-slots.
5. Valve guide removal and replacement.
6. Refacing and lapping of valves.
7. Valve seat grinding, cutting valve seat with angle cutter and lapping.
8. Reconditioning of cylinder head – checking of cracks, welding and cylinder head surface grinding.
9. Checking alignment of crankshaft – main bearing and connecting rod journals.

Part B

10. Line boring of main bearings.
11. Fitting of cylinder liners.
12. Truing brake drum on a brakedrum lathe.
13. Relining and grinding of brake shoes.
14. Reboring and homing of cylinders.
15. Static and dynamic balancing of wheels.
16. Grinding of flywheel.
17. Fitting the ring gear on the flywheel.
18. Identification and application of special tools and special equipment used in Automobile workshop.

SEMESTER : VI
Subject Code : AE 601
Subject Title : Industrial Engineering and Road Transport Organization
Structure of the Course Content

BLOCK 1 Principles of Management and personnel Management

Unit 1: Theories of management
Unit 2: Leadership and Motivation
Unit 3: Total Quality Management and Management Information Systems
Unit 4: Personnel Management

BLOCK 2 Financial management

Unit 1: Fixed and working capital
Unit 2: Depreciation
Unit 3: Objectives of a good stock control system
Unit 4: Purchasing procedure

BLOCK 3 Goods Transport Operation

Unit 1: Simple layout of garages and depot for goods transport vehicle
Unit 2: Materials Handling equipments in the goods vehicle depot
Unit 3: Settlement of claims
Unit 4: Transshipment and sub contracting

BLOCK 4 Passenger Transport Operation

Unit 1: Passenger Transport
Unit 2: Cclassification of vehicles
Unit 3: Fare table calculation
Unit 4: Operating cost

BLOCK 5 Motor vehicles Act, Road signals and Marketing Management

Unit 1: Motor vehicles Act and road signals
Unit 2: Inspection of accidents and recording
Unit 3: Total cost and fixed cost and variable cost and running cost
Unit 4: Control of costs

Books :

1. Goods vehicle Operation by Dunbar.
2. Bus Operation by Dunbar.
3. Tamilnadu Motor Vehicle Act 1989.
4. Industrial Management by Lundy.
5. Industrial Management by Davar.
6. Industrial Management by Bayar.
7. Industrial Management by K.K.Ahiya.
8. Industrial Management by S. Vedhapurt.
9. Industrial Engg. & Management Science by Bayar.
10. Industrial Management by Dr. B. Kumar.
11. Industrial Engg. & Production Control by R.K.Kuroma.

SEMESTER : VI
Subject Code : AE 602
Subject Title : CAD/CAM
Structure of the Course Content

BLOCK 1 Computer Aided Design

Unit 1: CAD Definition
Unit 2: I/O Devices
Unit 3: Memory
Unit 4: Types of CAD systems

BLOCK 2 Computer Aided Manufacturing

Unit 1: CAM Definition
Unit 2: Integrated CAD/CAM Organisation
Unit 3: Master Production schedule
Unit 4: Product Development cycle

BLOCK 3 CNC Machines

Unit 1: Numerical Control
Unit 2: NC, CNC and adaptive control systems
Unit 3: Types of CNC Machines
Unit 4: CNC EDA Machines

BLOCK 4 CNC components and Part programming

Unit 1: Drives
Unit 2: Actuating systems
Unit 3: CNC programming procedures
Unit 4: CAD Models

BLOCK 5 GT – FMS – CIM –AGV and Robotic

Unit 1: FMS
Unit 2: CIM
Unit 3: AGV
Unit 4: Robotic

Books :

1.CAD/CAM/CIM, R.Radhakrishnan, S.Subramanian, V.Raju, 2nd, 2003, New Age International Pvt Ltd..

2. CAD/CAM, Mikell P.Groover, Emory Zimmers Jr. Indian Reprint Oct 1993, Prentice Hall of India

3. NC Programming, I Edition, 2001 by S.K.Sinha, Galgotia Publications Pvt. Ltd

4. CAD/CAM Principles and Applications, 2002 by Dr.P.N.Rao, Tata Mc Graw Hill Publishing Company, New Delhi

5. Mastering CAD/CAM, Special Indian Edition 2007 by Ibrahim Zeid, Tata Mc Graw Hill Publishing Company, New Delhi

6. Automation, Production Systems, and Computer-Integrated Manufacturing by Mikell P. Groover, Pearson Education Asia

7. Computer control of manufacturing systems, International Edition by Yoram Koren, Tata Mc Graw Hill Publishing Company, New Delhi

8. Computer Aided Manufacturing by C.Elanchzian, T.Sunder Selwyn, G.Shanmuga Sundar, Laxmi Narayan, S.Chand & Co, New Delhi

9.CAD/CAM: Principles and Applications by Rao, Tata Mc Graw Hill Publishing

10.CAD/CAM: Theory and Practice by Zeid, Tata Mc Graw Hill Publishing Company, New Delhi

Subject Code : AE 603
Subject Title : Automobile Maintenance and Pollution Control
Structure of the Course Content

BLOCK 1 Maintenance Records & Schedule and Overhauling of Engine

Unit 1: Daily maintenance
Unit 2: Inspection forms Log books
Unit 3: Cleaning methods
Unit 4: Reconditioning methods

BLOCK 2 Maintenance, repair & Overhauling of Chassis driveline

Unit 1: Clutch, Mechanical automatic types
Unit 2: Front and rear axle
Unit 3: Steering systems manual and power
Unit 4: Tyre maintenance

BLOCK 3 Maintenance, Repair and Servicing of Electrical system

Unit 1: Battery
Unit 2: Starter motor
Unit 3: Dc Generator, Ac Alternator, Regulator
Unit 4: Electric hom, Wiper, Flasher Electric fuel pump, gauges

BLOCK 4 Emissions from Automobiles

Unit 1: Various emissions from Automobiles
Unit 2: Ploy nuclear aromatic hydrocarbon emissions
Unit 3: Emission from C.I Engine
Unit 4: White, Blue and Black smokes

BLOCK 5 Emission control Methods

Unit 1: Controlling of pollutants from engine
Unit 2: catalytic converters
Unit 3: Fumigation EGR
Unit 4: Air injection

Books :

1. I.C. Engine by V. Ganesan
2. I.C. Engine by K.K. Ramalingam
3. Pollution Control Board Guide Lines

SEMESTER : VI
Subject Code : AE 604
Subject Title : CAD/CAM lab

PART-1 CAD Practical

3D CAD Drawing – Solid Modeling & Lisp Programming

1. Predefined 3D objects – converting 2D plan into a 3D model – 3Dmesh – 3Dface - 3Dpoly -creating surfaces – Rulsurf – Revsurf – Tabsurf – Edgesurf – isolines -3DView – viewports –Vpoint – hide – dview – modelspace - paper space.

2. 3D solid primitives - creating region – pedit – extrude – revolve - combining object – union –subtract – intersect – Align – Fillet – chamfer - Advanced 3D editing techniques – align - 3D array–Mirror 3D - Rotate3D.

3. Working with UCS – 3D coordinate system – DDUCS – Plan – UCS icon

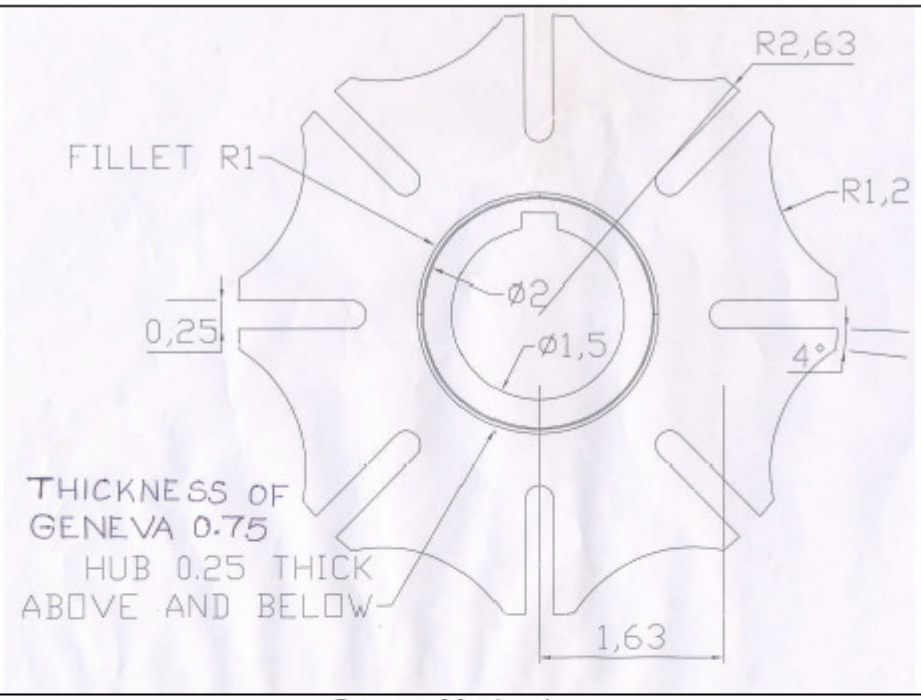
4. Solid Rendering – material attaching and detaching – shade with color – slice and sectioning –script – 3D orbit – calculating mass properties

5. Developing LISP program – constructing a list – input/output functions – control structures -arithmetic operations – trigonometric functions – special functions.

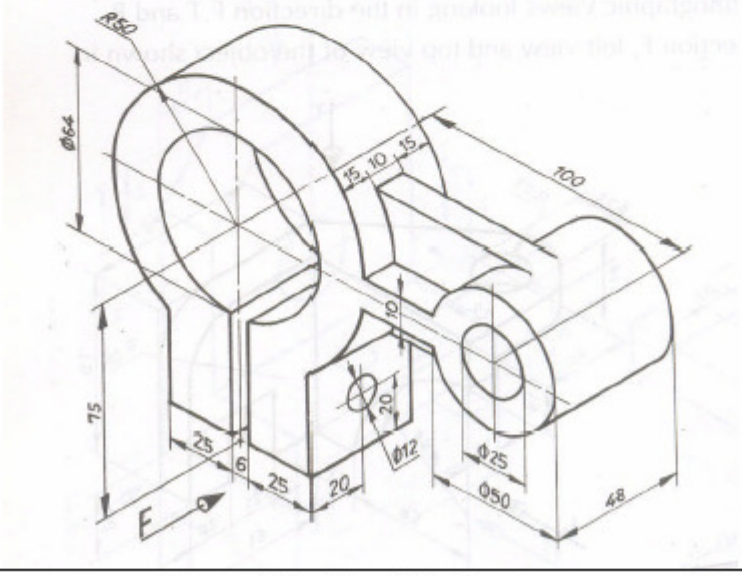
3D solid modeling and LISP programming practice
i) Geneva Mechanism
ii) Cast Iron Block
iii) Bearing Block
iv) Bushed Bearing
v) Gib and Cotter joint
vi) Screw Jack
vii) Universal Coupling

Part-2 CAM Practical

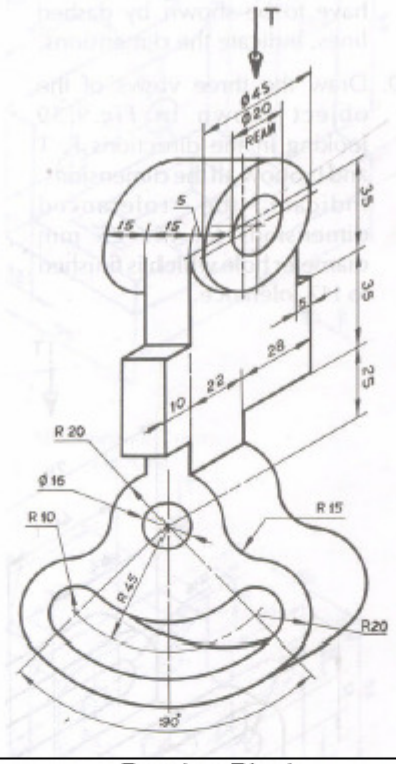
Exercise practice
CNC Lathe
1. Develop a part program for step turning and simulate
2. Develop a part program for taper turning and simulate
3. Develop a part program for circular interpolation and simulate
4. Develop a part program for multiple turning operation and simulate
5. Develop a part program for thread cutting, grooving and simulate
6. Develop a part program for internal drills, boring and simulate
CNC Milling
7 Develop a part program for grooving and simulate
8. Develop a part program for drilling (canned cycle) and simulate
9. Develop a part program for mirroring with subroutines and simulate
10.Develop a part program for rectangular and circular pocketing and simulate



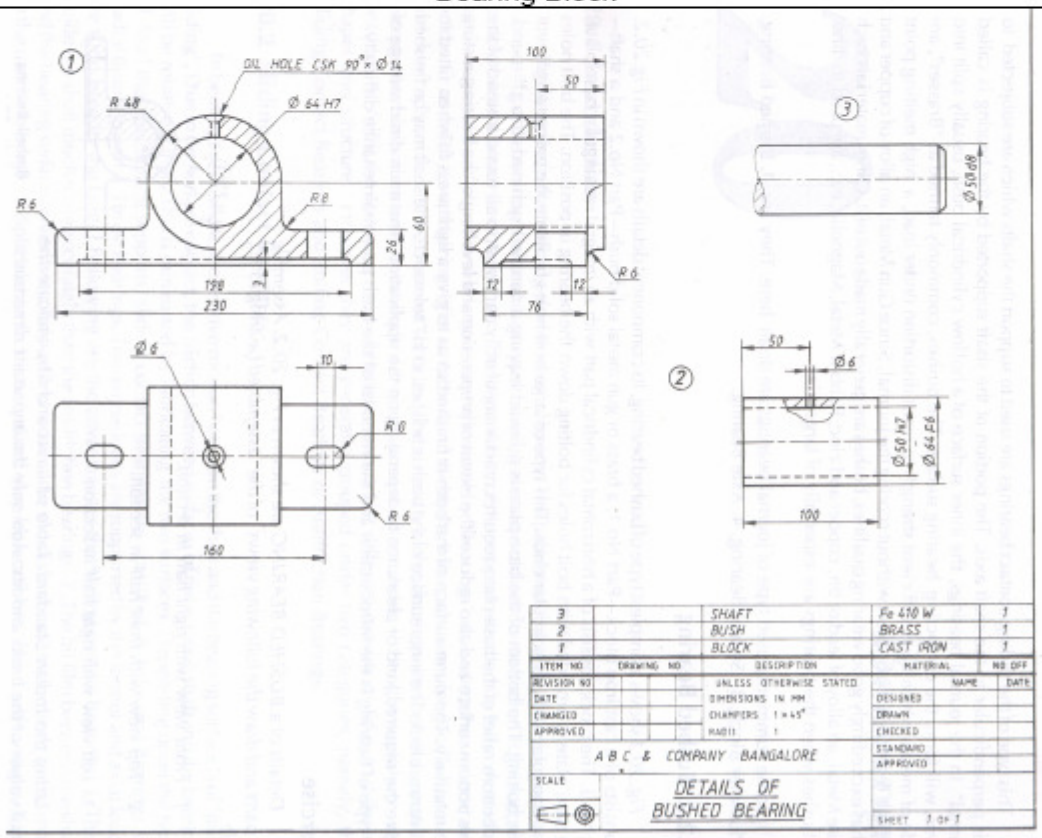
Geneva Mechanism



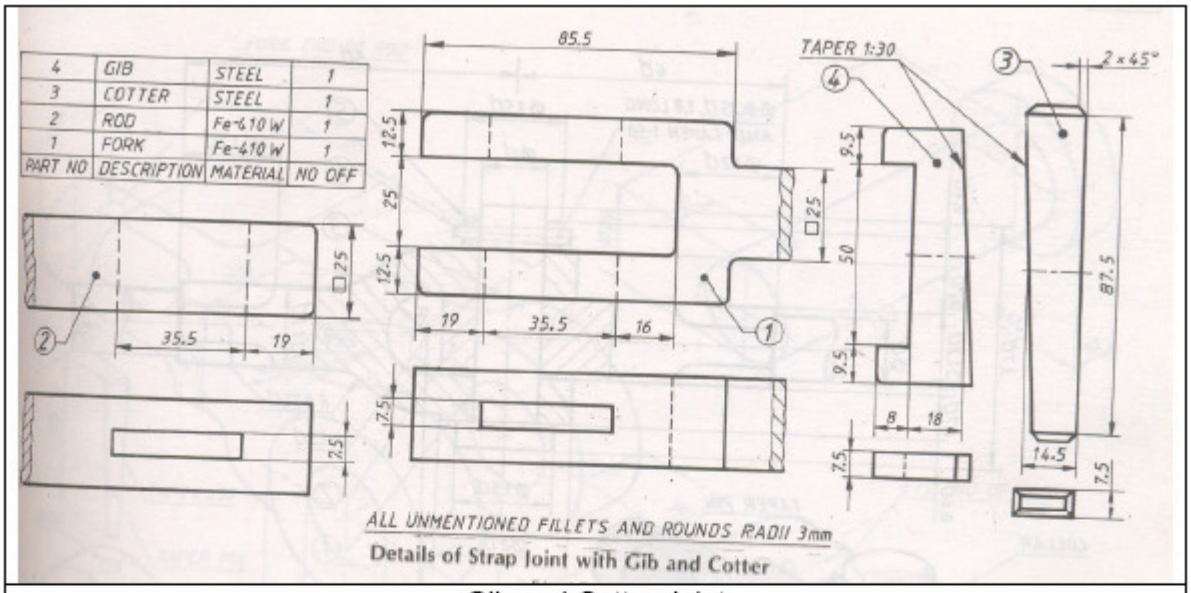
Cast iron Block



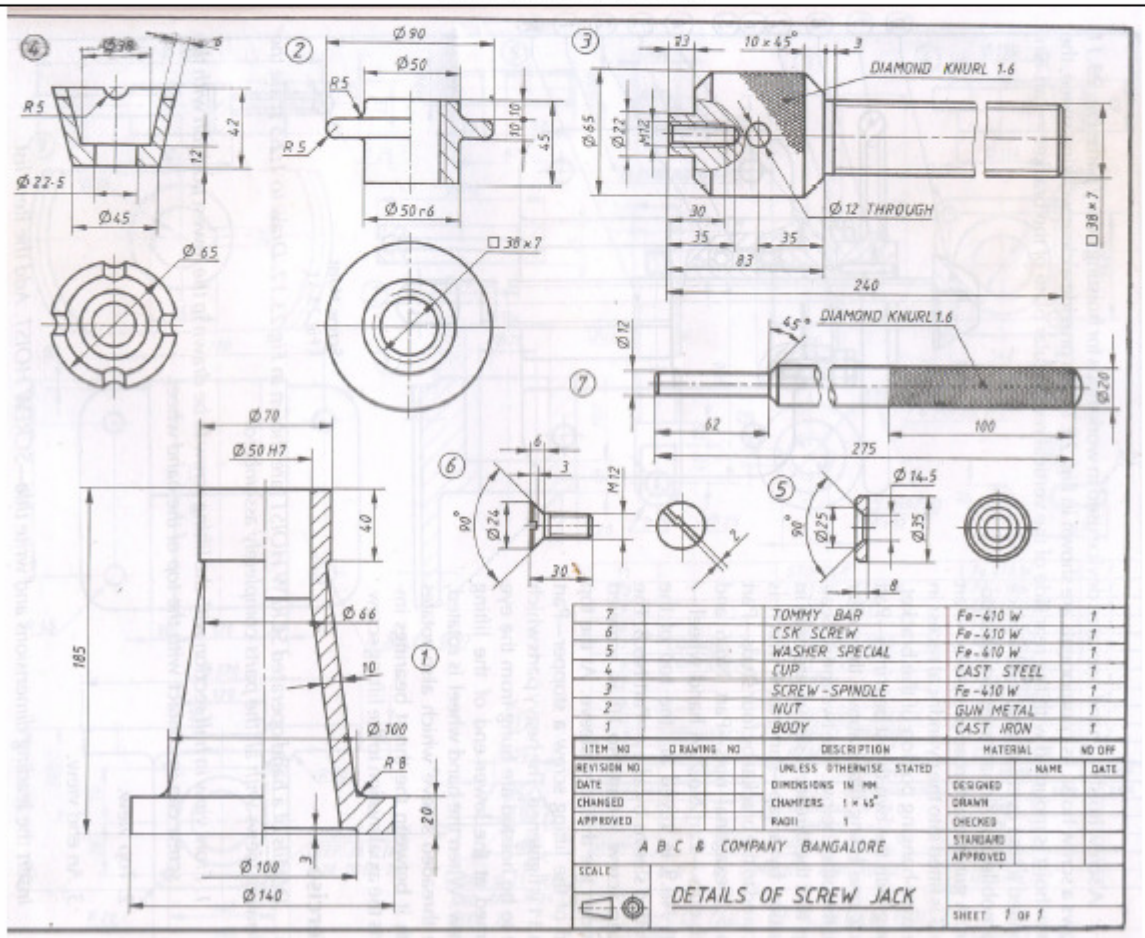
Bearing Block



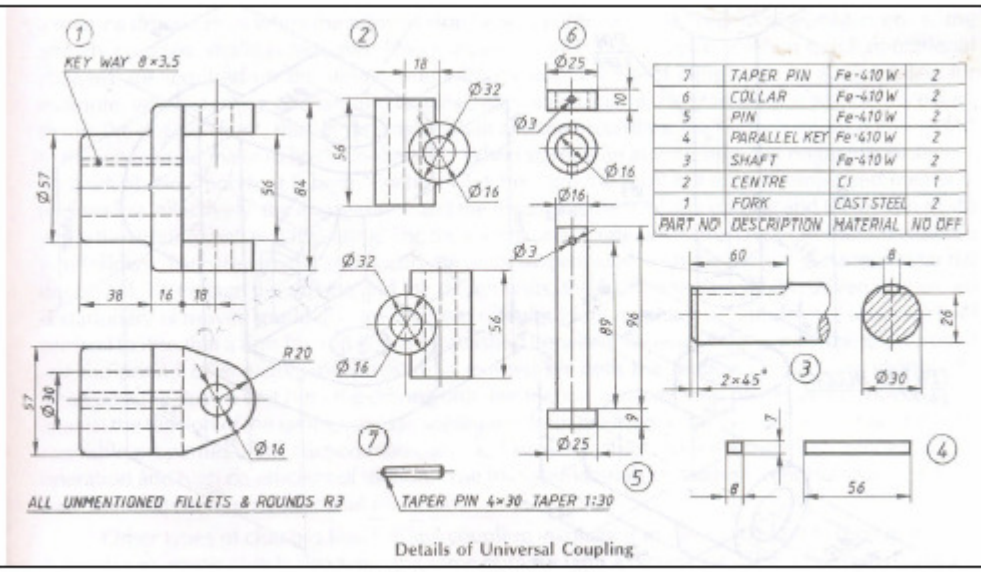
Bushed Bearing



Gib and Cotter Joint



Screw Jack



PART NO	DESCRIPTION	MATERIAL	NO OFF
7	TAPER PIN	Fe-410 W	2
6	COLLAR	Fe-410 W	2
5	PIN	Fe-410 W	2
4	PARALLEL KEY	Fe-410 W	2
3	SHAFT	Fe-410 W	2
2	CENTRE	CI	1
1	FORK	CAST STEEL	2

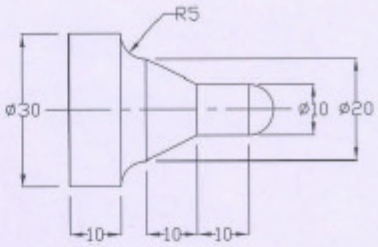
Details of Universal Coupling

Universal Coupling

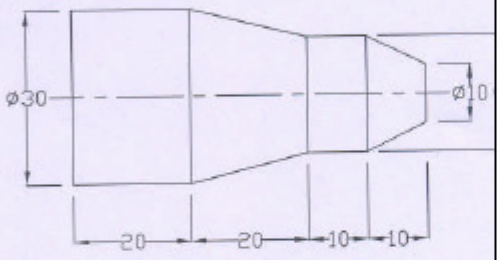
CAM Practicals – Lathe

STEP TURNING

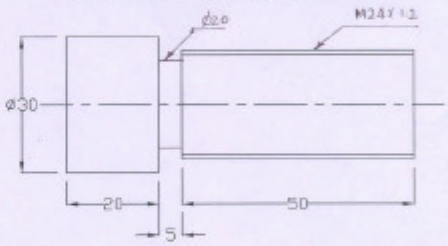
MULTIPLE TURNING CYCLE



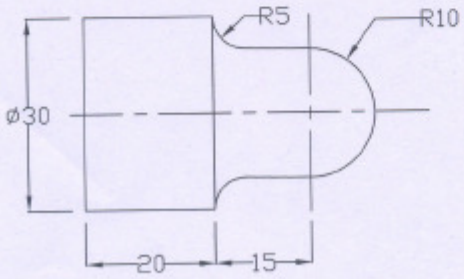
TAPER TURNING



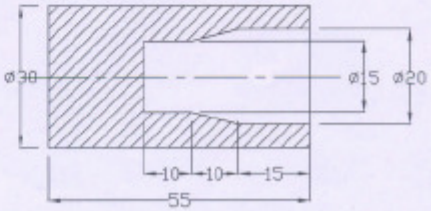
THREADCUTTING &GROOVING



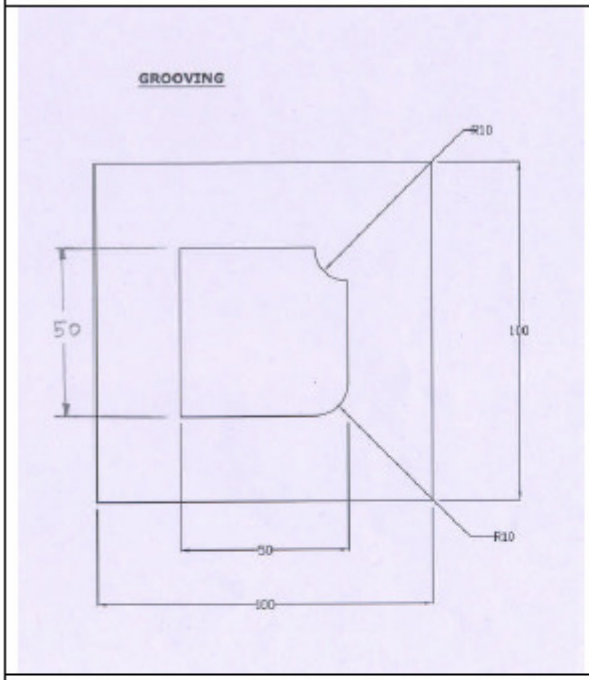
CIRCULAR INTERPOLATION

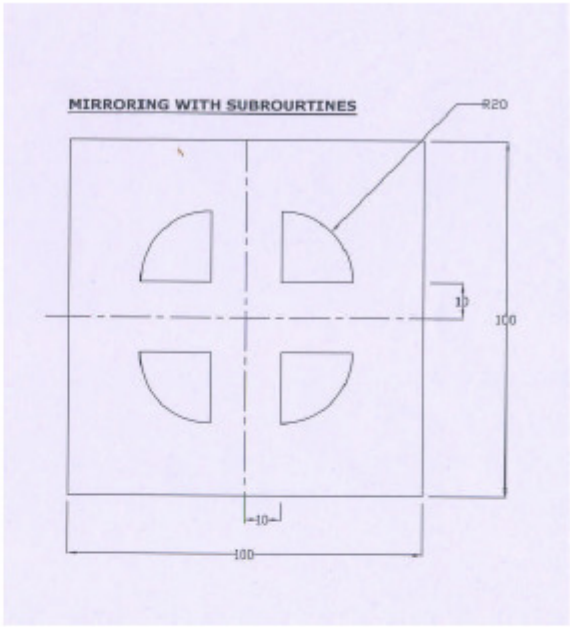


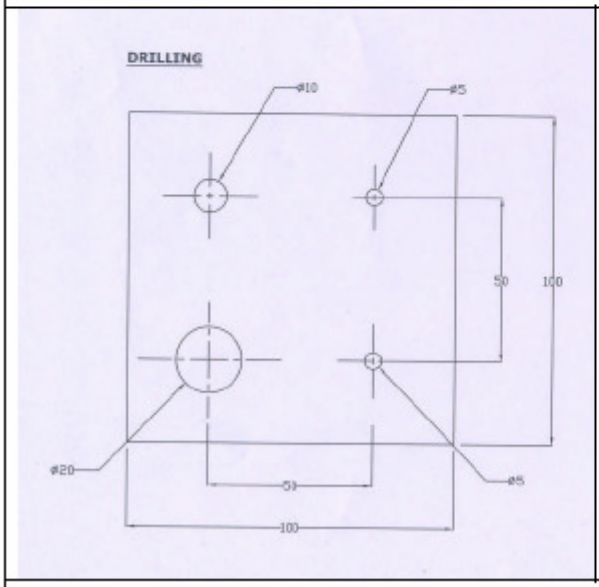
INTERNAL DRILLS&BORES

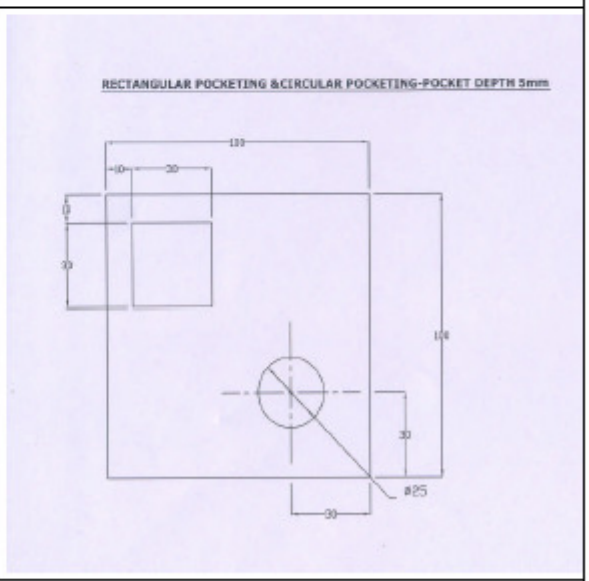


CAM Practical - Milling









SEMESTER : VI

Subject Code : AE 605

Subject Title : Project