

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Mechanical Engineering

For batches admitted in Session 2019-20

100105: Engineering Graphics

Category	Title	Code	Credit-4			Theory Slot
			L	T	P	
Engineering Science-ESC	Engineering Graphics	100105/CEL/MEL/CSL/ EEL/ELL/ITL/CHL/ BTL105/1X25/BEEL/BELL/ BETL/BCHL/BAUL105/ BCEL/BMEL/BCSL/ BITL/BBTL204	3	-	2	Max.Marks-70 Min.Marks-22 Duration-3hrs.

Course Objective:

1. To inculcate the imagination and mental visualization capabilities for interpreting the geometrical details of common engineering objects.
2. To impart knowledge about principles/methods related to projections of one,two and three dimensional objects.

Syllabus:

Unit - 1

Introduction and scale: Basics of instruments, Lettering and dimensioning, Plane geometrical constructions. Plain and diagonal scale - Representative fraction, Unit conversion and Exercises based on linear, area, volume and speed. Scale of chord.

Engineering curves: Cycloidal curves - cycloid, epicycloid and hypocycloid curve, tangent and normal. Spiral curves - Archimedean and logarithmic spiral curves. Tangent & normal on the curves. Involute curve.

Unit - 2

Projection of points: Introduction, types of projections, quadrant system, positions of points and Exercise.

Projection of straight line: Introduction, Orientation of a straight line, Traces of a line and Exercise.

Unit - 3

Projection of planes: Introduction, Types of planes, Traces of planes, Position of planes and Exercise.

Projection of solids: Introduction, Types of solids, Positions of solids and Exercise.

Unit - 4

Section of solids: introduction, Types of section planes and Anti-section and Exercise.

Development of surfaces of right solids: Introduction, Methods of development & anti-development and Exercise.

Intersection of cylinders: Introduction, methods of developments, intersection of cylinder by another cylinder and exercise.

Unit - 5

Isometric projections: Introduction, isometric scale, isometric axis, isometric view and isometric projections from orthographic views, orthographic views from pictorial view and exercise.

Computer Aided Drafting using Auto CAD: Introduction, software's basic commands, transformation and editing commands.

Course Outcomes: After successful completion of this course students will be able to:

CO1. Visualize the geometric details of engineering objects.

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CO2. Translate the geometric information of engineering objects into engineering drawings.

CO3. Draw orthographic projections and sections.

CO4. Develop knowledge to read, understand and explain drawing.

CO5. Improve their skills so that they can apply these skills in developing new products.

CO6. Prepare simple layout of factory, machine and buildings.

Text books:

1. Engineering Drawing by N. D. Bhatt, Charotar Publication Pvt. Ltd.
2. Engineering Drawing by P.S. Gill, S. K. kataria& sons, Delhi
3. Engineering Drawing by BasantAgrawal& C. M. Agrawal, Tata McGraw Hill Education Pvt. Ltd.
4. Engineering Graphics by K. Venugopal, New Age International Publication, India

NPTEL Link for Engineering Graphics:

<http://nptel.ac.in/courses/112103019/>

Laboratory Work

List of Experiments:

1. To prepare sheet of Plain scale, diagonal scale and Scale of chord.
2. To prepare sheet of Cycloidal curves.
3. To prepare sheet of Projection of points and lines.
4. To prepare sheet of Projection of Planes.
5. To prepare sheet of Projection of Solids.
6. To prepare sheet of Section of Solids.
7. To prepare sheet of Development of Surfaces.
8. To prepare sheet of Isometric and Intersection of Solids.

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100106: Manufacturing Practices

Category	Title	Code	Credit-1			Practical Slot
			L	T	P	
Engineering Science-ESC	Manufacturing Practices	100106	-	-	2	Max.Marks-50 Min.Marks-16

Course Objectives:

1. To familiarize with the basics of tools and equipment's used in fitting, carpentry, sheet metal, welding and smithy.
2. To with the production of simple models in the above trades.
3. To develop general machining skills in the students.

Syllabus

UNIT-I

Introduction: Manufacturing Processes and its Classification, Casting, Machining, Plastic deformation and Metal forming, Joining Processes, Heat treatment process, Assembly process.

Black Smithy Shop

Use of various smithy tools. Forging operations; Upsetting, Drawing down, Fullering, swaging, Cutting down, Forge welding, Punching and drafting.

Suggested Jobs: Forging of chisel, forging of Screw Driver.

UNIT-II Carpentry Shop

Timber: Type, Qualities of timber disease, Timber grains, Structure of timber, Timber seasoning, Timber preservation. Wood Working Tools: Wood Working Machinery, joints and joinery, various operations of planning using various carpentry planes sawing & marking of various carpentry joints.

Suggested Jobs: Name Plate, Any of the carpentry joint like mortise or tennon Joint.

UNIT-III Fitting Shop:

Study and use of measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, feeler gauges, Micrometer. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting Operations: Chipping filling, Drilling and Tapping.

Suggested Jobs: Preparation of job piece by making use of filing, sawing and chipping, drilling and tapping operation.

UNIT-IV Foundry:

Pattern Making: Study of pattern materials, pattern allowances and types of patterns. Core box and core print, Use and care of tool used for making wooden patterns.

Moulding: Properties of good mould& Core sand, Composition of Green, Dry and Loam sand. Methods used to prepare simple green and bench and pit mould dry sand bench mould using single piece and split patterns.

UNIT-V Welding: Study and use of tools used for Brazing, Soldering, Gas& Arc welding. Preparing Lap & Butt joints using Gas and Arc welding methods, study of TIG and MIG welding processes.Safety precautions.

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Course Outcome: After successful completion of this course students will be able to:

CO1. Discuss the hand tools, machine tools and power tools.

CO2. Utilize appropriate tools required for specific operation.

CO3. Apply safety measures required to be taken while using the tools in floor shops, Machine shops and carpentry shop.

CO4. Use the techniques, skills, and modern engineering tools necessary for manufacturing and production engineering.

CO5. Conduct experiments in the field of Production engineering.

CO6. Design a system, components, or process to meet desired needs, ethical, health and safety, manufacturability and sustainability.

Text & References Books:

1. Bawa HS; Workshop Practice, TMH
2. Rao PN; Manufacturing Technology-Vol.1 & 2, TMH
3. John KC; Mechanical Workshop Practice; PHI
4. HazraChoudhry; workshop Practice-Vol.1 & 2.
5. Jain R. K.; Production Technology

NPTEL Link for Manufacturing Practices

<http://nptel.ac.in/courses/112107145/>

Laboratory Work:

Relevant shop floor exercises involving practice in forging, Carpentry, fitting, pattern making, Sand casting, Moulding, Welding, Sheet metal fabrication techniques.