

RTM Nagpur University
Syllabus (Theory)

Semester	Course Title (Subject)	Hours / Week			Credits	Maximum Marks			Exam Duration (Hrs.)
		L	T	P		Continual Assessment	University Examination	Total	
III	Machine Drawing and Solid Modeling	0	1	2	2	50	50	100	

Sr. No.	Course Objective The objective of this course is–
1	To make students conversant with machine drawing standards, techniques, symbols, notations, creation of 2-D and 3-D detailing of parts, GD&T, drawing reading, production drawing and process sheet.
Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Interpret and describe basic elements of standard machine drawing like lines, dimensions, tolerances, symbols etc.
CO2	Create 2-D detailing, sectional views of machine elements from given isometric view.
CO3	Understand and apply concepts of GD&T for creating part and assembly drawing.

SYLLABUS	
Contents	No of hours
Unit I : Basic Drawing Standards: Drawing Sheets, Name Blocks, Types of Lines, Types of Dimensioning, Applying Tolerances, Standard Components and their representations, Standard Features, Machining Symbols, Welding Symbols, Surface Finish Symbols, Heat Treatment, Manufacturing Instructions, Allowances, Materials.	5 hrs
Unit II: Orthographic projections: 2-D orthographic projection of machine elements, Sectional views, Dimensioning and detailing.	5hrs
Unit III: GD & T: Concepts of Limit, Fits and Tolerances (Standard, types, application and selection for assembly and manufacturing method), Surface Finish requirement for assembly, Manufacturing Method, Geometrics suitable for assembly. Principals and practical applications of geometrical dimensioning and tolerance.	5 hrs

Sr. No.	List of Tutorials
01	Drawing Sheets, Name Blocks, Types of Lines, Standard dimensioning methods, Applying Tolerances.

02	Standard Components and their representations, Standard Features.
03	Machining Symbols, Welding Symbols, Surface Finish Symbols.
04	Heat Treatment, Manufacturing Instructions, Allowances, Materials.
05	2-D orthographic projection of machine elements
06	2-D orthographic projection of machine elements
07	Sectional views
08	Dimensioning and detailing.
09	Limit, Fits and Tolerances (Standard, types, application and selection for assembly and manufacturing method)
10	Geometrical dimensioning and tolerances (symbols, applications) datum's, referencing.
11	Industrial Drawing Reading: Students to be give industrial (production) drawing of different components, they will be asked to study the drawing thoroughly, understand and interpret the meanings of symbol and notations and there importance.

References:

Text Books Recommended:

1. Naryana K.L., Kannaiah R., Venkata Reddy K "Machine Drawing", New Age Int.Pub,
2. Naryana K.L., Kannaiah R., Venkata Reddy K "Production Drawing ", New Age Int.Pub,
3. N.D.Bhatt "Machine Drawing; Ed", Charotar Publishing House, 33 . rd

Reference Books Recommended:

1. PSG College of Technology "Design data", DPV Printers, Coimbatore, 1 2000.
2. "Engg. Drawing practice for schools & colleges", Bureau of Indian Standards, 1 Ed.; , 2002. st1998

RTM Nagpur University
Proposed Syllabus (Practical)

Semester	Course Title(Subject)	Hours / Week			Credits	Maximum Marks		
		L	T	P		Continual Assessment	University Examination	Total
4 th	Machine Drawing and Solid Modeling		1	2	2	50	50	100

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Create 2-D orthographic manual drawings as well as digital drawing using CAD software package of standard machine components
CO2	Apply standard practices for creation of 2-D orthographic manual drawings as well as digital drawing using CAD software package of assembly with dimension detailing, part list and ballooning. Also perform 2-D detailing of assembly components.
CO3	Create 3-D solid model and 2-D detailing of simple parts using CAD software package and perform 2-D detailing.
CO4	Create production drawing and process sheet for standard machine components.
CO5	Get hands on experience of reverse engineering process and concepts.

List of Practical's

Sr. No.	List of Practical's
01	2-D Orthographic pencil drawings of standard components with dimensions and detailing: Minimum One sheet
02	2-D Orthographic pencil drawings showing sectional views of part with dimensions and detailing: Minimum One sheet
03	2-D Orthographic pencil drawings of Assembly showing at least two views with assembly dimensioning, part list and ballooning: Minimum One sheet
04	2-D Orthographic pencil drawings of Assembly detailing (disassembly) showing dimensional details of assembly components : Minimum One sheet
05	Creating 3-D solid model of simple part with basic features like extrude, revolve, holes, round, chamfer from given 2-D detailing using any CAD software package. Perform 2-D drafting and detailing of solid model: Print out showing 2-D detailing and pictorial view (isometric view) of part to be submitted.
06	Creating 2-D Orthographic drawings of Assembly with one sectional view with assembly dimensioning, part list and ballooning using any CAD software package: Print out to be submitted.
07	Production drawing and process sheet: Prepare production drawing and process sheet of any standard machine component using CAD software package: Submit print out.
08	Compulsory Reverse engineering group activity (maximum 4 members in a group): Each group to be given unique assembly comprising of minimum four components (preferably standard assembly e.g. bearing housing, tool post, clutch housing, automobile parts, parts in workshop facilities etc.). Students to disassemble all parts, study each part, identify standard components, perform complete reverse engineering process: create rough sketch of each part, measure its various dimensions using basic measuring instruments (ruler scale,

	vernier etc.), prepare final drawing using any CAD software package , apply GD&T: Print out showing complete detailing of each assembly component to be submitted.
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