

**DEPARTMENT OF MECHANICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI**

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech. Mechanical Engineering		
Course Title	Machine Drawing		
Course Code	MEPC31	No. of credits	3
Pre-requisites Course Code	MEIR 12. Engineering Graphics		
Session	July 2019	Class & Section	III Sem - Sec (A & B)
Name of Faculty	Dr. K. R. Balasubramanian	Department	Mechanical Engineering
E-mail ID	krebala@nitt.edu	Telephone No.	9443561873
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
<p>Standardization - Interchangeability - Selective Assembly - Tolerance. Tolerance of form and position - grades of tolerance - fits -Standard tolerances - Machining symbols - surface finish indication - Functional and manufacturing datum.</p> <p>Shaft Couplings: rigid, flexible: cotter joints, knuckle joints, Hook's joints. Bearings - Journal - Footstep, thrust or Collar bearing; Plummer block; Pulleys for flat belts, V-belt and rope.</p> <p>Engine parts - Stuffing box, Connecting rod, Atomizer, spark plug, fuel injection pump. Valves - stop valve- safety valve, relief valve and non-return valve. Machine tool components - Drill jig, Tail stock,</p> <p>Tool post, Tool head for shaping machine, machine vice, screw jack.</p>			

Course Objectives

1. To understand and apply national and international standards while drawing machine component.
2. To understand the concept of various tolerances and fits used for component design
3. To familiarize in drawing assembly, orthographic and sectional views of various machine components.

Course Outcomes (CO)

Course Outcomes

Aligned Programme Outcomes (PO)

On completing this course students will be able to,

1. Identify the national and international standards pertaining to machine drawing.
2. Apply limits and tolerances to assemblies and choose appropriate fits.
3. Recognize machining and surface finish symbols.
4. Explain the functional and manufacturing datum.
5. Illustrate various machine components through drawings

Cos/Pos		Course Outcomes (Cos)			
		CO1	CO2	CO3	CO4
Programme Outcomes (Pos)	PO1	H	H	H	H
	PO2	H	H	H	H
	PO3	H	H	H	H
	PO4	L	L	L	L
	PO5	H	H	H	H
	PO6	M	M	M	M
	PO7	M	M	M	M
	PO8	H	H	H	H
	PO9	M	M	M	M
	PO10	H	H	H	H
	PO11	M	M	M	M
	PO12	M	M	M	M

COURSE PLAN – PART II

Course Overview

The universal graphical expression is called the language of engineers. Engineering drawing is a legal document of the company. The design engineer is the one who create a new product or improve the existing one and should have a complete knowledge on its working principles, functional requirement and the manufacturing process involved in producing the final product. The ability to articulate ideas and design intent through sketching is one of the most valuable tools a design engineer can possess. The ideas and all needed information about the product should be conveyed properly. Sketches alone can explain better than any amount of written or oral explanations. The sketches (engineering drawing) when drawn as per the rules laid

down in national and international organizations for Standards (ISO) with necessary information enable the technicians to fabricate and make the assembly of the product to its actual size and shape.

A machine is an assembly of different parts arranged in a definite order that uses energy to perform an intended action. Drawing of machine elements is called machine drawing. Machine drawing must provide information about part number, dimensions, tolerances, surface finish, material and stock size, manufacturing process, special finishing process if required and number of stocks required for each assembly. This machine drawing course is a laboratory course and the purpose of this subject is to give an insight knowledge about drawing the machine parts manually as per the standards. Students must be familiar with industrial drafting practices and thorough understanding of production drawings to make themselves fit in industries. Proficiency in sketching can be achieved with constant practice only.

Students will get exposure to first angle and third angle of projection, principles of drawings and standards used in machine drawing. They will be acquainted with the methods of representation of sectional views and other conventions. Students will understand to draw the sectional or plain elevations / plans / and side views of final assembly drawings from part drawings with dimensioning and bill of materials. Further they will be exposed to limits, types of fits and tolerances.

Course Teaching and Learning Activities

S.No	Week	Topic	Mode of Delivery
1.	1 - 2	Introduction to SP46; Orthographic Projection; Fasteners	Chalk and talk and Power point presentation
2.	3 - 4	Assembly drawing and sectional drawing of Rigid and Flexible Couplings	Chalk and talk and Power point presentation
3.	5 - 6	Assembly drawing and sectional drawing of Bearings, Plumber block	Chalk and talk and Power point presentation
4.	7-8	Assembly drawing and sectional drawing of Thrust bearing, connecting rod	Chalk and talk and Power point presentation
5.	9-10	Limits fits and Tolerances; machining symbols; surface finish indication; Assembly drawing and sectional drawing of Tail stock	Chalk and talk and Power point presentation

6.	11-12	Assembly drawing and sectional drawing of Tool post, Tool head for shaping machine,	Chalk and talk and Power point presentation
7.	13-14	Assembly drawing and sectional drawing of machine vice, screw jack.	Chalk and talk and Power point presentation
8.	15-16	Assembly drawing and sectional drawing of valves	Chalk and talk and Power point presentation

Course Assessment Methods

S.No	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Written test - I	5 th Week	1 hour	10%
2.	Written test - II	10 th Week	1 hour	10%
3.	Continuous Assessment of Drawing Practice	During regular practice session	3 hours session	50%
CPA	Written Test (Portions including Written Tests 1 & 2)	12 th Week	1 hour	20%
4.	Final Assessment	17 th Week	3 hours	30%

Essential Readings: Textbooks, reference books, etc.

1. Dhawan, R.K., A Text Book of Machine Drawing, S. Chand & Company, 1996.
2. Ostrowsky, O., Engineering Drawing with CAD Applications, ELBS, 1995.
3. Engineering Drawing Practice for Schools & Colleges SP 46 : 2003.
4. Bertoline, Wiebe, Miller, Nasma., Technical Graphics Communication, Ifourth edition, McGraw-Hill, 2009.
5. K. R. Gopalakrishna, Machine Drawing in First Angle Projection, Subhas Stores, 2007
6. William P. Spence, Engineering Graphics, Prentice - Hall Inc, 1984

Course Exit Survey (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

1. Students can meet the faculty at any stage in the course duration in case he/she finds difficulty in understanding the concept.
2. Feedback form issued to students to express their comments about the course after completing the syllabus. Students are requested to give genuine feedback about the course.
3. Student knowledge about the topic covered in this course will be judged during drawing sessions and marks obtained in the written examination.

**COURSE POLICY
(preferred mode of correspondence with students, compensation assessment policy to be specified)**

- Students must attend all the classes regularly.
- If students missed any of the classes then that class exercise won't be evaluated and marks will not be given for that exercise.
- Students should submit the drawing sheet as per the instructions given at the end of each practice class. Late submission is not permitted.
- The Institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades.
- All assessment of a course will be done on the basis of marks.

COMPENSATION ASSESSMENT POLICY

Students who absent for Written test - I & II for genuine reasons may be permitted for writing compensation assessment. The syllabus for the compensation assessment will be for those prescribed for the written test I & II and prior approval from the faculty in-charge is mandatory for appearing compensation assessment.

ATTENDANCE POLICY

(A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**

Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

ADDITIONAL INFORMATION:

- Students can reach course faculty by fixing appointment through E-mail: (krbala@nitt.edu) or phone (94435 61873)

FOR APPROVAL:


Dr. K. R. Balasubramanian

(Course Faculty)


CC-Chairperson


Head of the Department

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