

PLASTIC PROCESSING-EL 2
Semester III (Production Engineering) SUB CODE: MEPR303-B
Teaching Scheme (Credits and Hours)

Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
3	0	0	3	3	3	70	30	20	0	120

LEARNING OBJECTIVES:

The objective of this course is

- To learn various concepts related to plastic processing machining
- To have practical purview of design of mould for processing of plastics

LESSON PLANNING

SR.NO	CHAPTER NO	DATE/WEEK	%WEIGTAGE
1	1,2	1 st 2 nd 3 rd	20
2	3,4	4 th 5 th 6 th	20
3	5	7 th 8 th 9 th	20
4	6	10 th 11 th 12 th	20
5	7,8	13 th 14 th 15 th	20

Total hours (Theory): 45, Total hours (Practical):00, Total hours: 45

DETAILED SYLLABUS

Chap . No.	Topic
1	Plastic materials: Classification of plastic materials, their physical and mechanical properties, selection of plastics for various applications, advantages and limitations of using plastics Mechatronics- Intergrated Design issues-Key element
2	Melt processing techniques: Polymer processing techniques such as extrusion, compression and transfer moulding
3	Injection moulding, blow moulding, thermoforming, rotational moulding, calendaring, Bag moulding reaction moulding. Classification of polymer processing operations. Simple model flows for analysing processing operations with examples
4	Constructional features of mold: constructional features of core and cavity plates, mold size and strength, cavity material, and fabrication, mold placement, constructional features and layout of runners and gates
5	Product design of moulded products: Various considerations such as wall thickness, fillets and radii, ribs, under, cuts, drafts, holes, threads, inserts parting lines, etc. surface treatment mould design for avoiding warpage. Standards for tolerances on moulded articles
6	Design of molds for plastic processing: Methodical mold design, determination of economical number of cavities, melt rheology, temperature control of injection molds, calculation of mold opening force and ejection force. Detail design of cooling system, ejection system and gating system. Moulding thermoplastics, thermosets, expandable polysterene, foamed engineering plastics, molds for reaction injection molding.

7	Computer applications in plastic molding: Use of various softwares for mold flow analysis, optimum gate location and defect analysis
8	Design: Design of component for balanced flow, optimization of process parameters of plastic molding.

INSTRUCTIONAL METHOD AND PEDAGOGY (Continuous Internal Assessment (CIA) Scheme)

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all units while conducting teaching & examination.
- Attendance is compulsory in lectures and Tutorial.
- Viva Voce will be conducted at the end of the semester of 30 Marks.
- One internal exam of 30 marks is conducted as a part of Mid semester evaluation.

STUDENTS LEARNING OUTCOMES:

At the end of the course

The students will gain an experience plastic processing techniques.

References

1. A.W. Birley, B. Howarth, Hana, "Mechanics of plastics processing properties",
2. J.E. Mark, R. West, "Inorganic Polymers", H.P. Alococ, Prentice Hall, 1992
3. Fried, "Poly. Science and Technology", Prentice Hall
4. Frados, "Plastic Engg. Hand Book"
5. Pattan, "Plastic Technology"
6. Glanill, "Plastic Engg. Data Book"
7. Charles Harper, "Handbook of Plastics Technologies", McGraw-Hill.