

LESSON PLAN

Class: T.E Production

Academic Term: July-Dec 2018

Course: Design of Mold & Metal Forming Tools **Course Code:** PEC501

Credit:04

Faculty Member: Prof. Dipali Kisan Bhise

Prerequisites: None

Course Objectives:

CO1	Demonstrate the concepts of metal casting and metal forming processes.
CO2	Identify the equipment, machinery and tooling used for sand casting/die casting.
CO3	Identify equipment, machinery and tooling used for forming processes (such as forging, rolling and extrusion).
CO4	Illustrate the basic theory pertaining to plastic deformation of metal.
CO5	Develop skills in designing tools, the set up for the processing techniques pertaining to various metal casting and metal forming operations.
CO6	Analyze various defects, their probable causes and remedial measures confronted with metal casting and forming processes.

Course Outcomes:

**(Preferably should the CO's mentioned in University Curriculum)*

- PO1** Engineering Knowledge –
- PO2** Problem Analysis –
- PO3** Design / Development of Solutions –
- PO4** Investigations of complex problems –
- PO5** Modern Tool Usage –
- PO6** Engineer and Society –
- PO7** Environment & Sustainability –
- PO8** Ethics
- PO9** Individual and Team Work
- PO10** Communication
- PO11** Project Mgmt & Finance
- PO12** Life-Long Learning –

Periods (Hours) per week:

Lecture:4 Hr

Practical:2 Hr

Tutorial:Nil

University Evaluation Method:

Theory examination: 80 Marks (3 Hrs)

Internal Assessment: 20 Marks (Avg. of Test1 and Test2)

Practical Examination: None

Oral Examination: 20

Term work: 25

Total: 150

Mapping of CO's to PO's:

CO# / PO#	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
PEC501.1	3	3	3	-	-	-	-	-	-	-	-	-
PEC501.2	3	3	3	-	-	-	-	-	-	-	-	-
PEC501.3	3	3	3	-	-	-	-	-	-	-	-	-
PEC501.4	3	3	3	-	-	-	-	-	-	-	-	-
PEC501.5	3	3	3									
PEC501.6	3	3	3									

CO# / PSO#	PSO 1	PSO 2
PEC501.1	2	-
PEC501.2	2	-
PEC501.3	2	-
PEC501.4	2	-
PEC501.5	2	-
PEC501.6	2	-

CO Attainment Scheme:

	Target for Assessment Tools		
	Unit Test	End Semester Exam	Course Exit Survey
PEC501.1	50%	50%	60%
PEC501.2	50%	50%	60%
PEC501.3	50%	50%	60%
PEC501.4	50%	50%	60%
PEC501.5	50%	50%	60%
PEC501.6	50%	50%	60%

Lesson Plan:

Week	Duration (Hrs.)	Topic	Module
Week 1 (2.07.18 - 8.07.18)	1	Introduction to DMMFT	1
	1	Introduction to sand Casting	
	1	Introduction Pattern and Classification of Pattern	
	1	Classification of Pattern	
Week 2 (9.07.18 - 15.07.18)	1	Introduction to Gating System	1
	1	Design Of Gating System	
	1	Design Of Gating System	
	1	Design Of Gating System	
Week 3 (16.07.18 - 22.07.18)	1	Design on sand Casting.	1
	1	Design on sand Casting.	
	1	Design on sand Casting.	
	1	Design on sand Casting.	
Week 4 (23.07.18 - 29.07.18)	1	Melting Practice	2
	1	Melting Practice	
	1	Defects in Casting	
	1	Defects in Casting and Give reason	
Week 5 (30.07.18 - 5.08.18)	1	Hot chamber casting and Cold Chamber casting	3
	1	Hot chamber casting and Cold Chamber casting	
	1	Defect in Die Casting	
	1	Investment Casting Working Principal And application.	
Week 6	1	Shell Mould casting: Working principle and application.	3

(6.08.18 - 12.08.18)	1	Design on Pressure Die Casting.	
	1	Design on Pressure Die Casting.	
	1	Design on Pressure Die Casting.	
Week 7 (13.08.18 - 19.08.18)		Unit Test 1	
Week 8 (20.08.18 - 26.08.18)	1	Forging hammers, high speed forging machines, Presses and Horizontal upset forging machines: Construction and principle of operation.	4
	1	High speed forging machines, Presses and Horizontal upset	
	1	Forging hammers, high speed forging machines, Presses and Horizontal upset forging machines: Construction and principle of operation.	
	1	Defects in forged products and their remedies.	
Week 9 (27.08.18 – 2-09.18)	1	Introduction To rolling	5
	1	Classification of rolling mills	
	1	Production of seamless tubes by rolling.	
	1	Defects in rolled products and their remedies.	
Week 10 (3.09.18 - 9.09.18)	1	Roll Pass Design(4 Passes)	5
	1	Roll Pass Design(6 Passes)	
	1	Roll Pass Design(6Passes)	
	1	Roll Pass Design(8 Passes)	
Week 11 (10.09.18 – 16.09.18)	1	Roll Pass Design(8 Passes)	5
	1	Introduction to Extrusion and Basic Concepts	6
	1	Drawing of metals: Principle of operation and applications.	
	1	Drawing of metals: Principle of operation and applications.	
Week 12 (17.09.18 - 23.09.18)	1	Revision On Sand Casting	1
	1		
	1		
	1		
Week 13 (24.09.18 - 30.9.18)	1	Revision On Die Casting	3
	1		
	1		
	1		
Week 14 (1.10.18 - 7.10.18)		Revision On Rolling	5

Reference Books:

1. *Manufacturing Technology*, P.N. Rao.
2. *Metal Casting : A Sand Casting Manual for the Small Foundry-Vol. 2*, Stephen D. Chastain.
3. *Principles of Metal Casting*, R W Heine, C R Loper, P. C. Rosenthal.

Laboratory Plan

Class: T.E Production

Academic Term: July-Dec 2018

Course: Design of Mold & Metal Forming Tools Laboratory

Corse Code: PEL501 , **Credit:**01

Faculty Member: Prof. Dipali Kisan Bhise

Outcomes: Learner will be able to...

PEL501.1. Illustrate various forming and casting processes used in manufacturing of components.

PEL501.2. Classify the equipment's and machines used in manufacturing processes, such as casting, rolling, forging, extrusion and wire drawing.

PEL501.3. Design and draw the moulds required for castings/ pressure die casting processes.

PEL501.4. Design and draw the dies required for forging processes.

PEL501.5. Design and draw the grooves required for rolling processes.

PEL501.6. Demonstrate various trends in the foundry/forging industries.

Sr. No	Design Exercise/Assignments
01	Assignment on Sand casting
02	Assignment on Special casting process.
03	Assignment on Extrusion process.
05	Design of sand casting moulds.
06	Design of Pressure die casting dies.
07	Design of Forging dies.
08	Design of Roll pass grooves.

CO-PO-PSO Mapping.

CO# / PO#	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
PEC501.1	3	3	3	-	-	-	-	-	-	-	-	-
PEC501.2	3	3	3	-	-	-	-	-	-	-	-	-
PEC501.3	3	3	3	-	-	-	-	-	-	-	-	-
PEC501.4	3	3	3	-	-	-	-	-	-	-	-	-
PEC501.5	3	3	3									
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PEC501.1	2	-
PEC501.2	2	-
PEC501.3	2	-
PEC501.4	2	-
PEC501.5	2	-
PEC501.6	2	-

CO Assessment tools with target:

Co Statement #	Target for Assessment Tools			
	Assignments	Drawing Sheets	Oral Exam	Course Exit Survey
PEL502.1	70%	-	60%	60%
PEL502.2	70%	-	60%	60%
PEL502.3	70%	-	60%	60%
PEL502.4	70%	60%	60%	60%
PEL502.5	70%	60%	60%	60%
PEL502.6	70%	60%	60%	60%

1. Curriculum Gap/Content beyond syllabus (if any).

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2. Lab Plan.

Week No.	Topics	Hours (Per Batch)
3 (16.07.18 - 22.07.18)	Assignment on Sand casting	2
4 (23.07.18 - 29.07.18)	Assignment on Sand casting	2
5 (30.07.18 - 5.08.18)	Design Of Sand Casting	2
6 (6.08.18 - 12.08.18)	Design Of Sand Casting	2
7 (13.08.18 - 19.08.18)	Assignment on Special casting process.	2
8 (20.08.18 - 26.08.18)	Design of Roll pass grooves.	2
9 (27.08.18 – 2-09.18)	Design of Roll pass grooves.	2
10 (3.09.18 - 9.09.18)	Design of Forging dies.	2
11 (10.09.18 – 16.09.18)	Design of Forging dies.	2
12 (17.09.18 - 23.09.18)	Assignment on Extrusion process.	2