

COURSE TEMPLATE

1.	Department/Centre proposing the course	Committee constituted by the Chairman, Senate	
2.	Course Title (<i>< 45 characters</i>)	PRODUCT REALIZATION	
3.	L-T-P structure	0-0-4	
4.	Credits	2.0	
5.	Course number	MEP 101	
6.	Status (<i>category for program</i>)	Engineering Core	

7.	Pre-requisites (<i>course no./title</i>)	None	
----	--	------	--

8.	Status vis-à-vis other courses (<i>give course number/title</i>)		
8.1	Overlap with any UG/PG course of the Dept./Centre	None	
8.2	Overlap with any UG/PG course of other Dept./Centre	None	
8.3	Supercedes any existing course	Has some overlap with earlier course MEL120	

9.	Not allowed for (<i>indicate program names</i>)		
----	---	--	--

10.	Frequency of offering	☐ Every sem ☐ 1 st sem ☐ 2 nd sem ☒ Either sem	
-----	------------------------------	---	--

11.	Faculty who will teach the course Interested faculty from across the institute;		
12.	Will the course require any visiting faculty?	No	

13.	Course objective (<i>about 50 words</i>): 1.Understanding the concepts involved in product realization by carrying out manufacturing shop exercises. 2.Hands on practice with manufacturing shop exercises and assembly leading to realization of a new product in a group. 3.While realizing a product, understand importance of manufacturing planning.		
-----	---	--	--

14.	Course contents (<i>about 100 words</i>) (<i>Include laboratory/design activities</i>): Exposing role of manufacturing processes in product realization; Understanding product realization by endeavouring hands on activities; Experience of product realization by undertaking manufacturing exercises and assembly activity in teams;		
-----	--	--	--

15. Lecture Outline *(with topics and number of lectures)*

Module no.	Topic	No. of hours
1	This is a course without any lecture component. Keeping this in view faculty's interaction and engagement with students during the practical classes is crucial to emphasize the importance of activities being carried out. Practical class size is expected to be 40-50 students, requiring about 10 faculty per semester. Each week student would be given a self study exercise which will be of exploratory in nature (not exceeding 2 hours)	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
COURSE TOTAL (14 times 'L')		

16. Brief description of tutorial activities

NA

17. Brief description of laboratory activities

Module no.	Experiment description	No. of hours
1	SESSION 1 Briefing: Introduction to the course and its objectives; mandatory briefing on shop-floor safety. Practicals: Visit and quick demonstration of all manufacturing facilities including hand tools and power tools available in the lab.	4
2	SESSION 2 Briefing: An overview of engineering materials and forms in which they are commonly available as raw materials. Practicals: Hands on exercises with wood working tools and machines to manufacture a component.	4
3	SESSION 3 Briefing: An overview of shape realization by manufacturing. Practicals: Machine shop exercise I - involving sawing, turning and drilling. SESSION 4 Briefing: Measurement of manufactured parts Practicals: Machine shop exercise II - involving milling, grinding and joining. Inspection of manufactured component using simple metrology instruments	8
4	SESSION 5	4

	Briefing: An overview of computer numerically controlled machines Practicals: Machine shop exercise using CNC - Part modeling, CNC program generation and cutting part on CNC milling machine	
5	SESSION 6 Briefing: Use of plastics and composites as engineering materials Practicals: Hands-on exercise involving plastics - use of vacuum forming, injection/compression molding, extrusion, ultrasonic welding of plastic components etc. SESSION 7 Briefing: Announcement of teams for product realization projects Practicals: Modeling and manufacture of parts using 3D printer	8
6	SESSION 8 Briefing: Overview of process Planning Practicals: process planning for product realization.	4
7	SESSION 9 Practicals: Presentation by students in teams on products selected for realization	4
8	SESSIONS 10, 11, 12, 13, 14 Practicals: Product realization exercise involving multiple manufacturing processes and assembly in teams; Evaluation of projects during SESSION 14.	20
9		
10		
COURSE TOTAL (14 times 'P')		56

18. Suggested texts and reference materials

STYLE: Author name and initials, Title, Edition, Publisher, Year.

SELECTED READING FROM:

1. Manufacturing Engineering and Technology by
Serope Kalpakjian and Steven Schmid, 7th Edition, 2013
2. Making It: Manufacturing Techniques for Product Design
Chris Lefteri, 2012
3. 21st Century Manufacturing
Paul Wright, 2000
4. Product Design: Techniques in Reverse Engineering and New Product Development
Kevin Otto and Kristine Wood, 2000

19. Resources required for the course *(itemized & student access requirements, if any)*

19.1	Software	Simple CAD/CAM software, Software having material and manufacturing database
19.2	Hardware	Computers and accessories
19.3	Teaching aides (videos, etc.)	Set of manufacturing videos
19.4	Laboratory	Dedicated laboratory only meant for this course (at least 9500 sq. ft).
19.5	Equipment	Hand Tools, Powered Hand Tools, Lathe (Conventional & CNC), Milling Machine (Conventional

		& CNC), Woodworking Tools & Machines, Sawing Machine, Bench Grinder, Drilling Machine, Micrometer, Profile Projector, Handheld Surface Roughness Tester, One simple table top Non-destructive testing machine, Vacuum forming machine, Injection/Compression Molding Machine, Ultrasonic Welding Machine, 3D printers, Assembly Planning kits. (Some of these are required in multiple quantities and primarily tabletop machines meant for conducting laboratory classes)
19.6	Classroom infrastructure	A normal class room with all multi media infrastructure to accommodate 50 students. (A class room to accommodate 250 to 450 students at a time may be required occasionally).
19.7	Site visits	Students may be encouraged to visit one industry or on-going exhibition in the city.

20. Design content of the course *(Percent of student time with examples, if possible)*

20.1	Design-type problems	Yes
20.2	Open-ended problems	Yes
20.3	Project-type activity	Yes
20.4	Open-ended laboratory work	Yes
20.5	Others (please specify)	

Date:

(Signature of the Head of the Department)