



DEPARTMENT OF MECHANICAL ENGINEERING

Lesson Plan & Work-done Diary for AY:2026-27, ODD Semester

Course with Code: ADDITIVE MANUFACTURING, BME741A				Faculty: Dr. Mohanakumara K C			Semester & Section: VII, A	
Class No.	Date planned (DD/MM)	Topics to be covered	TLP Planned	Class No.	Date of Conduction (DD/MM)	Topics Covered	TLP Executed	Remarks if any deviation
Bridge course								
1		Bridge course on fundamentals of Manufacturing-Casting, Forging,	Chalk and Talk + PPT					
2		Bridge course on fundamentals of Traditional manufacturing techniques-	Chalk and Talk + PPT					
3		Bridge course Machine Tools, subtractive manufacturing tools etc.	Chalk and Talk + PPT					
MODULE-1								
4		Module-1- Introduction and basic principles: Need for Additive Manufacturing, Generic AM process, stereolithography or 3dprinting.	PPT					
5		Rapid proto typing, the benefits of AM, distinction between AM and CNC machining,	PPT					
6		Associated technologies- reverse engineering technology.	PPT					
7		Development of Additive Manufacturing Technology: Introduction, computers, computer-aided design technology, other associated technologies.	PPT					

8		The use of layers, classification of AM processes,	PPT					
9		Metals systems, hybrid systems, milestones in AM development.	PPT					
10		Additive Manufacturing Process chain: Introduction, the eight steps in additive manufacture,	PPT					
11		AM process variations from one AM machine to another. Metal systems, maintenance of equipment,	PPT					
12		Materials handling issues, design for AM, and application areas.	PPT					

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MODULE-2								
13		Photo polymerization rocesses: Stereolitho graphy (SL), Materials, SL resin curing process, Microstereolithography,	PPT					
14		Process Benefits and Drawbacks, Applications of Photo polymerization Processes.	PPT					
15		Powder bed fusion processes: Introduction, Selective laser Sintering (SLS), Materials, Powder fusion Mechanism., SLS Metal and ceramic part creation,	PPT					
16		Electron Beam melting (EBM), Process Benefits and Drawbacks, Applications of Powder Bed Fusion Processes.	PPT					
17		IA-1						

18		Extrusion-based systems: FDM, Principles, Materials, Plotting and path Control.	PPT					
19		Bio-Extrusion, Process Benefits and Drawbacks,	PPT					
20		Applications of Extrusion-Based Processes.	Chalk and Talk + PPT					

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MODULE-3								
21		Printing Processes: evolution of printing as an additive manufacturing process, research achievements in printing deposition, technical challenges of printing.	PPT					
22		Printing process modeling, material modification methods, three-dimensional printing, advantages of binder printing	PPT					
23		Sheet Lamination Processes: Materials, Laminated Object Manufacturing (LOM), Ultrasonic Consolidation (UC), Gluing, Thermal bonding, LOM and UC applications.	PPT					
24		Beam Deposition Processes: introduction, general beam deposition process, description material delivery, BD systems.	PPT					
25		Process parameters, typical materials and microstructure, processing–structure–properties relationships, BD benefits and drawbacks.	PPT					

26		Direct Write Technologies: Background, ink -based DW.	PPT					
27		Laser transfer, DW thermal spray, DW beam deposition,DW liquid-phase directde position	PPT					

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MODULE-4								
28		Guidelines for Process Selection: Introduction, selection methods for apart, challenges of selection.	PPT					
29		IA-2						
30		System for preliminary selection, production planning and control.	PPT					
31		Software issues for Additive Manufacturing: Introduction, preparation of cad models – the STL file.	PPT					
32		Problems with STL files, STL file manipulation.	PPT					
33		Post- Processing: Support material removal,	PPT					
34		Surface texture improvements, Preparation for use as a pattern.	PPT					
35		Property enhancements using non-thermal techniques and thermal techniques.	PPT					

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	(DD/MM)							
MODULE-5								
36		The use of multiple materials in additive manufacturing: Introduction, multiple material approaches, discrete multiple material processes, porous multiple material processes	PPT					
37		Blended multiple material processes, commercial applications using multiple materials, future directions.	PPT					
38		AM Applications: Functional models, Pattern for investment and vacuum casting, Medical models, art models, Engineering analysis models, Rapid tooling, new materials development. Bi-metallic parts, Remanufacturing,	PPT					
39		Application: Examples for Aerospace, defense, automobile, Bio-medical and general engineering industries.	PPT					
40		Direct digital manufacturing: Align Technology	PPT					
41		Siemens and phonak, DDM drivers. Manufacturing vs. prototyping, life- cycle costing, future of direct digital manufacturing						
42		IA-3						
43		Case Study Discussions	PPT					
44		Revision on modules and related video demo.	PPT					
45		Revision on modules and related video demo.	PPT-Videos					

	Activity	Planned	Actual	Remarks
1	Theory Classes	42+3		
2	Assignments/ Quizzes/ Self-study	5+1		
3	Tutorials/ Extra classes	-		
4	Internal Assessments	3		
5	ICT based Teaching (% of usage in Curriculum)	96%		
Planning			Execution	
Faculty Signature:			Faculty Signature:	
HoD Signature:			HoD Signature:	