



**Lesson Plan & Work-done Diary for AY:2023-24, ODD Semester**

Course with Code: ADDITIVE MANUFACTURING, 18ME741				Faculty: Mr. Anil Kumar K			Semester & Section: VII	
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
<b>MODULE-1</b>								
1		Bridge course on fundamentals of Manufacturing-Casting, Forging,	Chalk and Talk					
2		Bridge course on fundamentals of Traditional manufacturing techniques-M/C Tools, subtractive manufacturing tools etc.	Chalk and Talk					
3		Module-1- Introduction and basic principles: Need for Additive Manufacturing, Generic AM process, stereolithography or 3dprinting.	Chalk and Talk					
4		Rapid proto typing, the benefits of AM, distinction between AM and CNC machining,	Chalk and Talk					
5		Associated technologies- reverse engineering technology.	Chalk and Talk					
6		Development of Additive Manufacturing Technology: Introduction, computers, computer-aided design technology, other associated technologies.	Chalk and Talk					
7		The use of layers, classification of AM processes, metals	Chalk and Talk					



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		systems, hybrid systems, milestones in AM development.						
8		<b>Additive Manufacturing Process chain:</b> Introduction, the eight steps in additive manufacture, variations from one AM machine to another.	Chalk and Talk					
9		Metal systems, maintenance of equipment, materials handling issues, design for AM, and application areas.	Chalk and Talk + PPT					
10		Revision on module 1 and related video demo. Quiz on module 1	PPT					



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<b>MODULE-2</b>								
11		<b>Photo polymerization processes:</b> Stereolitho graphy (SL), Materials, SL resin curing process, Microstereolithography,	Chalk and Talk					
12		Process Benefits and Drawbacks, Applications of Photo polymerization Processes.	Chalk and Talk					
13		<b>Powder bedfusion processes:</b> Introduction, Selective laser Sintering (SLS), Materials, Powder fusion Mechanism., SLS Metal and ceramic part creation,	Chalk and Talk					
14		Electron Beam melting (EBM), Process Benefits and Drawbacks, Applications of Powder Bed Fusion Processes.	Chalk and Talk					
15		<b>Extrusion-based systems:</b> Fused Deposition Modelling (FDM), Principles, Materials, Plotting and path Control.	Chalk and Talk + PPT					
16		Bio-Extrusion, Process Benefits and Drawbacks, Applications of Extrusion-Based Processes.	Chalk and Talk + PPT					
17		<b>Revision on module 2 and related video demo. Quiz on module 2</b>	PPT					



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<b>MODULE-3</b>								
18		<b>Printing Processes:</b> evolution of printing as an additive manufacturing process, research achievements in printing deposition, technical challenges of printing.	Chalk and Talk					
19		Printing process modeling, material modification methods, three-dimensional printing, advantages of binder printing	Chalk and Talk					
20		<b>Sheet Lamination Processes:</b> Materials, Laminated Object Manufacturing (LOM), Ultrasonic Consolidation (UC), Gluing, Thermal bonding, LOM and UC applications.	Chalk and Talk					
22		<b>Beam Deposition Processes:</b> introduction, general beam deposition process, description material delivery, BD systems.	Chalk and Talk					
22		Process parameters, typical materials and microstructure, processing–structure–properties relationships, BD benefits and drawbacks.	Chalk and Talk					
23		<b>Direct Write Technologies:</b> Background, ink -based DW, laser transfer, DW thermal spray, DW beam deposition, DW liquid-phase directde position.	Chalk and Talk + PPT					
24		<b>Revision on module 3 and related video demo.</b> <b>Quiz on module 3.</b>	PPT					



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<b>MODULE-4</b>								
25		<b>Guidelines for Process Selection:</b> Introduction, selection methods for apart, challenges of selection.	Chalk and Talk					
26		System for preliminary selection, production planning and control.	Chalk and Talk					
27		<b>Software issues for Additive Manufacturing:</b> Introduction, preparation of cad models – the STL file.	Chalk and Talk					
28		Problems with STL files, STL file manipulation.	Chalk and Talk					
29		<b>Post- Processing:</b> Support material removal, surface texture improvements, preparation for use as a pattern.	Chalk and Talk + PPT					
30		Property enhancements using non-thermal techniques and thermal techniques.	Chalk and Talk + PPT					
31		<b>Revision on module 4 and related video demo. Quiz on module 4.</b>	PPT					



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<b>MODULE-5</b>								
32		<b>The use of multiple materials in additive manufacturing:</b> Introduction, multiple material approaches, discrete multiple material processes,	Chalk and Talk					
33		porous multiple material processes Blended multiple material processes,	Chalk and Talk					
34		commercial applications using multiple materials, future directions.	Chalk and Talk					
35		<b>AM Applications:</b> Functional models, Pattern for investment and vacuum casting, Medical models, art models, Engineering analysis models, Rapid tooling, new materials development.	Chalk and Talk + PPT					
36		Bi-metallic parts, Remanufacturing, Application: Examples for Aerospace, defense, automobile, Bio-medical and general engineering industries.	Chalk and Talk + PPT					
37		<b>Direct digital manufacturing:</b> Align Technology,	Chalk and Talk + PPT					
38		siemens and phonak, DDM drivers.	PPT					
39		Manufacturing vs. prototyping, life-cycle costing,	Chalk and Talk + PPT					
40		future of direct digital manufacturing.	Chalk and Talk + PPT					
41		<b>Revision on module 5 and related video demo.</b>	PPT					
42		<b>Quiz on module 5.</b>						



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