

Branch Name:	Mechanical Engineering(Production Technology)
Program Code:	ET209
Course Name:	Additive Manufacturing Practical
Course Code:	2ET2090402P
Pre-requisite Course:	Instructor's permission

Course Objectives:

- To acquaint students with the concept of Additive Manufacturing (AM), various AM technologies, selection of materials for AM, modeling of AM processes, and their applications in various fields.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (Marks)				
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
01	-	-	02	02	-	-	-	-	10	25	10	25	50

Subject Contents:

Sr. No	Detail of Practical	Contact Hours
1	Introduction to Computer Aided Design and Additive Manufacturing	02
2	Study of various Additive Manufacturing processes	02
3	Overview of Rapid Prototyping.	02
4	Introduction to 3D Printing Technology	02
5	Hands on 3D Printing Technology- Geometry Modelling	02
6	Hands on 3D Printing Technology- Slicing Methods	02
7	Hands on Method of creating a three dimensional object layer-by-layer using a computer created design	02
8	Hands on 3D scanner and allowing to replicate the shape of given object	02
9	Assignments	02

List of Reference Books:

1. Ian Gibson, David W. Rosen, Brent Stucker, Additive manufacturing technologies Rapid Prototyping to Direct Digital Manufacturing Springer, 2010.
2. Andreas Gebhardt, Understanding Additive Manufacturing: Rapid Prototyping, Rapid tooling, Rapid manufacturing, Hanser Publishers, 2011.
3. J. D. Majumdar and I. Manna, Laser-assisted fabrication of materials, Springer Series in Material Science, e-ISBN: 978-3-642-28359-8.
4. L. Lu, J. Fuh and Y.-S. Wong, Laser-induced materials and processes for rapid prototyping, Kluwer Academic Press, 2001
5. Zhiqiang Fan and Frank Liou, Numerical modeling of the additive manufacturing (AM) Processes of titanium alloy, InTech, 2012.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Demonstrate a basic technical understanding of the physical principles, materials, and operation of the types of AM processes.	3 Applying
CLO2	Understand and use techniques for processing of CAD models for rapid prototyping.	2 Understanding
CLO3	Apply fundamentals of Additive Manufacturing techniques.	3 Applying
CLO4	Describe the relationships between AM process phenomena and part accuracy and surface finish.	2 Understanding
CLO5	Predict appropriate tooling for rapid prototyping process.	3 Applying 4 Analyze
CLO6	Distinguish Additive Manufacturing Processes and other related technology.	2 Understanding 6 Creating

Mapping of CLOs with POs & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	H		H		M							L	H	
CLO2		H		M			L		L				M	
CLO3			M			M		L			L			L
CLO4	H				M					M		M	M	
CLO5		M		L			M		M					H
CLO6	H		M		H		L				M			M

H:High, M:Medium, L:Low