SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA, M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)

Mechanical Engineering Department

Semester/Year		**VI** / III	Program		B.Tech.
Subject Category	**OE**	Subject Code:	505	Subject Name:	**Industry 4.0 & 3-D Printing**

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10				100	3	0	0	3

Prerequisites:(Only for open electives)

None

Course Objective:

This course is designed to provide a basic understanding of present Industrial revolution and Additive Manufacturing process. It will also help in understanding the journey of industrial revolution and introducing recent trends in advanced technologies and its implementation in the industries.

Course Outcomes:

After completion of the course, students would be able to -

1. Understand about the Industry 4.0 (I4.0)
2. Understand about the various components of Industry 4.0
3. Understand about design and application of I4.0
4. Understand about Additive Manufacturing (AM) and its different processes
5. Apply the concepts of AM

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2	2	3			1		2
CO2	3	1	2	1		1	2					1
CO3	2	3	3	2	2	3	1					
CO4	1	2	2	2	1	2	1					2
CO5	2	2	2	1	2	1	1		2			2

Contents:

UNITs	Descriptions	Hrs.	CO's
I	**Industry 4.0 (I4.0) :** Introduction, State of Art, Industrial Revolutions, Principles of I4.0, attributes of I4.0, Characteristics of Industry 4.0, and Framework for Industry 4.0, Opportunities and challenges of I4.0, Roadmap of I4.0.	8	1
II	**Components of Industry 4.0 :** Internet Of Things (IOT), Industrial Internet of Things (IIOT), Cyber Physical System (CPS), Cyber security : Introduction , Block chain Technology, Autonomous Robot, Cobots,	8	2
III	**Components of I4.0 and its design and application :** Virtual Reality (VR), Augmented Reality (AR), AR Hardware and Software, Industrial Applications of AR, Digital Twin, Concept of M2M Communication. Artificial Intelligence (AI) ,Design Prerequisites of Industry 4.0, What I4.0 fix in our business	8	3
IV	**Additive manufacturing (AM) (3-D Printing):** Introduction, reason of evolution, conventional manufacturing, characteristics of AM, AM process chain, Types of AM processes: Polymerization, sintering and melting, Extrusion, 3-D Printing (Powder Binding Bonding), Layer Laminated Object Manufacturing.	8	4
V	**Application of AM** : Automotive, Aerospace, Medical, Art	8	5

Guest Lectures (if any)		
Total Hours	40	

Suggestive list of experiments: Nil

Text Books-

1)Ian Gibson. David Rosen. Brent Stucker, Additive Manufacturing Technologies, Springer, ISBN 978-1-4939-2112-6

2)Andreas Gebhardt, Understanding Additive Manufacturing, Hanser Publication Cincinati, ISBN-13:978-1-56990-507-4.

Reference Books-

Modes of Evaluation and Rubric

There will be continuous evaluation for during the semester for 40 sessional marks and 60 semester End-term Marks. Out of 40 sessional marks, 20 shall be awarded for Mid-semester, 20 marks to be awarded for day-to-day performance and Quizzes/Assignments. For the 60 Marks, there will be a semester – End examination as per the norms of AICTE.

Recommendation by the Board of Studies on	Date: 07/6/2024
Approval by the Academic Council on	Date:
Compiled and designed by	Name : Dr.Pankaj Agarwal
Checked and approved by	Name : Dr. Sanjay Katarey