Walchand College of Engineering, Sangli
(Government Aided Autonomous Institute)

AY 2023-24

Course Information

Programme	M.Tech. (Mechanical Production Engineering)
Class, Semester	First Year M. Tech., Sem - II
Course Code	7OE505
Course Name	Advanced Production Systems
Desired Requisites:	

Teaching Scheme		Examination Scheme (Marks)			
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
		Credits: 3			

Course Objectives

1	To impart the knowledge of the fundamentals in advanced production systems.
2	To prepare the student for the use of the recent developments in production systems and techniques for manufacturing
3	To develop the student for selection of appropriate production systems and techniques considering the advantages, limitations, cost economy, etc.

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

CO	Course Outcome Statement/s	Bloom's Taxonomy Level	Bloom's Taxonomy Description
CO1	Distinguish the elements and techniques in conventional and advanced production systems	II	Understanding
CO2	Identify appropriate production systems for manufacturing implementation	IV	Analyzing
CO3	Recommend modern equipment's, techniques, tools and methodology for advanced production systems.	V	Evaluating

Module	Module Contents	Hours
I	Origin of CIM- the changing manufacturing and management scene - External communication - islands of automation and software-dedicated and open systems-manufacturing automation protocol - product related activities of a company- marketing engineering - production planning - plant operations - business and financial management	7
II	History of group technology- role of G.T. in CAD/CAM integration - part families - classification and coding - DCLASS and MICLASS and OPITZ coding systems-facility design using G.T. - benefits of G.T. - cellular manufacturing systems. Process planning - role of process planning in CAD/CAM integration - approaches to computer aided process planning – Types of CAPP	6
III	Shop floor control-phases -factory data collection system -automatic identification methods-Bar code technology-automated data collection system. FMS-components of FMS - types -FMS workstation -material handling and storage systems- Information flow in Shop floor control systems	7
IV	Designing database-Hierarchical Model-Network Approach-Relational Data Model-Concepts, Principles, Keys, Relational Operations-Functional Dependence-Normalization, Types - Query Languages.	7

V	CIM and company strategy - system modeling tools -IDEF models - activity cycle diagram CIM open system architecture (CIMOSA)- manufacturing enterprise wheel-CIM architecture- CIM implementation software. Communication fundamentals- local area networks -topology -LAN implementations – network management and installations	6
VI	Open systems - open system inter connection -manufacturing automations protocol and technical office protocol (MAP /TOP) Development of databases - Architecture of database systems - data modeling and data associations - relational data bases - database operators - advantages of data base and relational database.	6

	Textbooks
1	Mikell.P.Groover "Automation, Production Systems and computer integrated manufacturing", Pearson Education 2008.
2	Groover M.P., "Automation, Production Systems and Computer Integrated Manufacturing", Prentice-Hall of India Pvt Ltd., New Delhi, 2010
3	Kalpakjain, "Manufacturing Engineering and Technology", Addision-Wesley Publishing Co.1995.

	References
1	Ranky, Paul G., "Computer Integrated Manufacturing", Prentice Hall International, 2010.
2	David D.Bedworth, Mark R.Hendersan, Phillip M.Wolfe "Computer Integrated Design and Manufacturing", McGraw-Hill Inc 2008.
3	Date.C.J, "An Introduction to Database Systems", Narosa Publishing House, 2004..
4	Kerr.R, "Knowledge Based Manufacturing Management", Addison Wesley, 2003

	Useful Links
1	https://nptel.ac.in/courses/112/107/112107078/
2	https://nptel.ac.in/courses/112/107/112107077/
3	https://nptel.ac.in/courses/110/106/110106044/

CO-PO Mapping

	Programme Outcomes (PO)					
	1	**2**	**3**	**4**	**5**	**6**
CO1	1	2				
CO2		2	3			
CO3			2	2	2	

The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High

Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)