# GOVERNMENT POLYTECHNIC, MALKANGIRI
## DEPARTMENT OF MECHANICAL ENGINEERING

| Discipline:- MECHANICAL ENGG. | Semester:- 6TH | Name of Teaching Faculty:- Sri SAURAV RANJAN PRADHAN, WORKSHOP SUPERINTENDENT | |
|---|---|---|---|
| SUB:- ADVANCE MANUFACTURING PROCESSES | *No of Days* /per week class allotted:- 04 | Semester From Date:-04.02.25 To Date:-17.05.25<br>No of Weeks-15 | |
| PRE-REQUISITE | Basic knowledge about Manufacturing process. | | |
| COURSE OUTCOMES | CO1:- Understand the working principle of modern machining processes.<br>CO2:- Understand the Plastic Processing.<br>CO3:- Understand the additive manufacturing process.<br>CO4:- Understand the Special Purpose Machines.<br>CO5:- Understand the Maintenance of Machine Tools. | | |
| **WEEK** | **CLASS DAY** | **THEORY/PRACTICAL TOPICS** | **DELIVERY METHOD** |
| 1ST | 1st | Introduction – comparison with traditional machining | Whiteboard |
| | 2nd | Ultrasonic Machining:- Principle, Description of equipment | Whiteboard |
| | 3rd | Ultrasonic Machining:- Advantages, Disadvantages applications | Whiteboard |
| | 4th | Electric Discharge Machining:-Principle, Description of equipment | Whiteboard |
| 2ND | 1st | Electric Discharge Machining:- Dielectric fluid, tools (electrodes) | Whiteboard |
| | 2nd | Electric Discharge Machining:- Process parameters, Output characteristics, applications | PPT |
| | 3rd | Wire cut EDM:- Principle, Description of equipment | Whiteboard |
| | 4th | Wire cut EDM:- Controlling parameters, applications | Whiteboard |
| 3RD | 1st | Abrasive Jet Machining:- Principle, description of equipment | Whiteboard |
| | 2nd | Abrasive Jet Machining:- Material removal rate, application | Whiteboard |
| | 3rd | Abrasive Jet Machining:- Advantages, Dis advantagesapplication | Whiteboard |
| | 4th | Laser Beam Machining:- principle, description of equipment | Whiteboard |
| 4TH | 1st | Laser Beam Machining:- Material removal rate, application | Whiteboard |
| | 2nd | Electro Chemical Machining:-principle, description of equipment | PPT |
| | 3rd | Electro Chemical Machining:-Material removal rate, application | Whiteboard |
| | 4th | Plasma Arc Machining :– Principle, description of equipment, Material removal rate | Whiteboard |
| | 1st | Plasma Arc Machining :– Process parameters, performance characterization, Applications | Whiteboard |

| | | | |
|---|---|---|---|
| 5TH | 2nd | Electron Beam Machining :- Principle, description of equipment, Material removal rate | Whiteboard |
| | 3rd | Electron Beam Machining :- Process parameters, performance characterization, Applications | Whiteboard |
| | 4th | **REVISION CH-1/QUIZ & ASSIGNMENT-1** | Lecture notes |
| 6TH | 1st | Processing of plastics | Whiteboard |
| | 2nd | Moulding processes: Injection moulding | Whiteboard |
| | 3rd | Moulding processes:Compression moulding | Whiteboard |
| | 4th | Moulding processes:Transfer moulding. | Whiteboard |
| 7TH | 1st | Extruding; Casting; Calendering. | PPT |
| | 2nd | Fabrication methods-Sheet forming | Whiteboard |
| | 3rd | Fabrication methods-Blow moulding | Whiteboard |
| | 4th | Fabrication methods- Laminating plastics (sheets, rods & tubes), Reinforcing | Whiteboard |
| 8TH | 1st | Applications of Plastics | Whiteboard |
| | 2nd | **REVISION CH-2/QUIZ & ASSIGNMENT-2** | Lecture notes |
| | 3rd | Introduction, Need for Additive Manufacturing | Whiteboard |
| | 4th | Fundamentals of Additive Manufacturing, AM Process Chain | Whiteboard |
| 9TH | 1st | Advantages and Limitations of AM, Commonly used Terms | Whiteboard |
| | 2nd | Classification of AM process, Fundamental Automated Processes | Whiteboard |
| | 3rd | Distinction between AM and CNC, other related technologies | PPT |
| | 4th | Application – Application in Design, Aerospace Industry | Whiteboard |
| 10TH | 1st | Application – Automotive Industry, Jewelry Industry | Whiteboard |
| | 2nd | Application – Arts and Architecture. | Whiteboard |
| | 3rd | RP Medical and Bioengineering Applications | Whiteboard |
| | 4th | Web Based Rapid Prototyping Systems | Whiteboard |
| 11TH | 1st | Concept of Flexible manufacturing process | Whiteboard |
| | 2nd | Concurrent engineering | Whiteboard |
| | 3rd | Production tools like capstan and turret lathes | Whiteboard |
| | 4th | Rapid prototyping processes | Whiteboard |
| 12TH | 1st | **REVISION CH-3/QUIZ & ASSIGNMENT-3** | Lecture notes |
| | 2nd | Special Purpose Machines (SPM), Concept | Whiteboard |
| | 3rd | General elements of SPM | PPT |

| | | | |
|---|---|---|---|
| | 4th | Productivity improvement by SPM | Whiteboard |
| 13TH | 1st | Productivity improvement by SPM | Whiteboard |
| | 2nd | Principles of SPM design | Whiteboard |
| | 3rd | Principles of SPM design | Whiteboard |
| | 4th | **REVISION CH-4/QUIZ & ASSIGNMENT-4** | Lecture notes |
| 14TH | 1st | Types of maintenance | Whiteboard |
| | 2nd | Repair cycle analysis | Whiteboard |
| | 3rd | Repair complexity | Whiteboard |
| | 4th | Maintenance manual | PPT |
| 15TH | 1st | Maintenance records | Whiteboard |
| | 2nd | Housekeeping | Whiteboard |
| | 3rd | Introduction to Total Productive Maintenance (TPM) | Whiteboard |
| | 4th | **REVISION CH-5/QUIZ & ASSIGNMENT-5** | Lecture notes |

**LEARNING RESOURCES-**

01:- Production technology –Vol-II, O.P.KHANNA

02:-Workshop Technology, Vol – II,B.S. Raghuwanshi

03:- Production Technology , HMT, Bangalore

04:- Rapid prototyping: Principles and Applications, Chua C.K., Leong K.F. and LIM C.S,

05:- Exploring Advanced Manufacturing Technologies, Stephen F. Krar & Arthur Gil

**WEBSITE RESOURCES-**

01:- www.youtube.com

03/02/25

**Sign. of Faculty concerned** **Sign. of HOD** **Sign. of Academic Co-ordinator**

**PRINCIPAL**
**Govt. Polytechnic, Malkangiri**