BALASORE.

Department of Mechanical Engineering

Lesson Plan

| Discipline: **Mechanical Engineering** | Semester: **6th** | Faculty: **MANOJ KUMAR SAHOO** |
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| Subject: **Advance Manufacturing processes** | No. Of Days/Week Allotted: **4** | Semester from :**14.03.2022** To: No. Of Weeks : **15** |
| **Week** | **Class Day** | **Theory Topics** |
| **1st** | 1st | **Module 1.Non conventional machining process:** What is Non-conventional machining process? Difference between Conventional and non-conventional machining. Types of non-conventional machining |
| | 2nd | Ultrasonic Machining: principle, Description of equipment, applications |
| | 3rd | Electric Discharge Machining: Principle, Description of equipment, Dielectric fluid, tools (electrodes), Process parameters, Output characteristics, applications. |
| | 4th | Abrasive Jet Machining: principle, description of equipment, Material removal rate, application. |
| **2nd** | 1st | Laser Beam Machining: principle, description of equipment, Material removal rate, application. |
| | 2nd | Electro Chemical Machining: principle, description of equipment, Material removal rate, application. |
| | 3rd | Electro Chemical Machining: principle, description of equipment, Material removal rate, application. |
| | 4th | Plasma Arc Machining – principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications |
| **3rd** | 1st | Plasma Arc Machining – principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications |
| | 2nd | Electron Beam Machining - principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications |
| | 3rd | Electron Beam Machining - principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications |
| | 4th | Topic end, Question answer discussion, Assignment 1 |
| **4th** | 1st | **Module2.Plastic Processing** Introduction,thermoset and thermoplast plastic. |

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| | 2nd | Proocssing of plastics |
| | 3rd | Moulding processes: Injection moulding, |
| | 4th | Compression moulding, Transfer moulding |
| 5th | 1st | Extruding; Casting; Calendering. |
| | 2nd | Fabrication methods-Sheet forming, Blow moulding, Laminating plastics (sheets, rods & tubes), Reinforcing. |
| | 3rd | Applications of Plastics. |
| | 4th | Topic end, Question answer discussion, Assignment 11 |
| 6th | 1st | **Module 3 Additive Manufacturing Process** Introduction |
| | 2nd | Need for Additive Manufacturing |
| | 3rd | Fundamentals of Additive Manufacturing, |
| | 4th | AM Process Chain |
| 7th | 1st | Advantages and Limitations of AM, |
| | 2nd | Commonly used Terms, Classification of AM process, |
| | 3rd | Fundamental Automated Processes |
| | 4th | Distinction between AM and CNC, |
| 8th | 1st | Other related technologies. |
| | 2nd | Application –Application in Design, Aerospace Industry, Automotive Industry |
| | 3rd | Application- Jewellery Industry, Arts and Architecture. RP Medical and Bioengineering Applications |
| | 4th | Web Based Rapid Prototyping Systems. |
| 9th | 1st | Concept of Flexible manufacturing process |
| | 2nd | Concurrent engineering |
| | 3rd | production tools like capstan and turret lathes, |
| | 4th | Rapid prototyping processes |
| 10th | 1st | Topic end, Question answer discussion, Assignment III |
| | 2nd | **Module4.Special Purpose Machines (SPM): Introduction** |
| | 3rd | Concept, General elements of SPM |
| | 4th | Productivity improvement by SPM, |
| 11th | 1st | Productivity improvement by SPM, |
| | 2nd | Productivity improvement by SPM, |
| | 3rd | Principles of SPM design. |
| | 4th | Principles of SPM design. |
| 12th | 1st | Revision for |
| | 2nd | **Module5.Maintenance of Machine Tools:** |
| | 3rd | Types of maintenance |
| | 4th | Types of maintenance |
| 13th | 1st | Repair cycle analysis |
| | 2nd | Repair cycle analysis |
| | 3rd | Repair complexity |

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| | 4th | Maintenance manual, |
| 14th | 1st | Maintenance records |
| | 2nd | Housekeeping |
| | 3rd | Introduction to Total Productive Maintenance (TPM). |
| | 4th | Total Productive Maintenance (TPM). |
| 15th | 1st | Revision |
| | 2nd | Revision |
| | 3rd | Revision |
| | 4th | Revision |

Manoj Kr. Sahoo (Prof)