# Government Polytechnic Gariyaband Dist- Gariyaband

## Department of Mechanical Engineering

**LESSON PLAN**

**Session :-** 2024-25 (Jan-June-25)

**Name of Faculty :-** LALIT KUMAR SAHU

**Course :-** Diploma

**Branch/Semester :-** Mechanical 6TH Sem

**Total Class Per Week :-** 05

**Subject Name & Code :- Advanced Manufacturing Processes 2037682(037)**

| Unit No. | No Of Lecture Required | Topic to be covered | Lecture no. | Actual no. of Lecture taken | Planned Date | Execution Date | Delivery Method | Remark |
|---|---|---|---|---|---|---|---|---|
| Unit-1.0 Non-Conventional Machining Processes | (Approx. Hrs: L+P+T=16) | 1.1 Need of advance manufacturing, manufacturing trends and challenges, manufacturing aspects. | 01 | 01 | 07/01/25. | 07/01/25 | Marker Board. | |
| | | 1.2 Types of non conventional machining processes and energy source utilized. | 02 | 02 | 09/01/25 | 09/01/25 | white Board/Projector | |
| | | 1.3 Working principle, setup, Process parameter Advantages, limitation and application and safe practices of- Electrical discharge machining (EDM), Wire Electrical discharge machining (WEDM), Electrochemical Machining (ECM), Plasma arc machining (PAM), Abrasive jet machining (AJM), Ultrasonic Machining (USM), Electron Beam Machining (EBM), Laser beam machining (Cutting) | 03-12 | 03-14 | 10/01/25 to 30/01/25. | 10, 14, 17 21, 23, 24 28, 30, 03 Jan-25 04, -06 Feb 2025. | Projector white Board | |
| | | Tutorial Class/RemidialClass/Doubt Class | | | | | | |
| | | Assignment | 01 | | Unit-1 (1) | | Notes. | |
| Unit-2.0 | (Approx. Hrs: P+L+T = 13) | 2.1 Metal casting basics, Gating and riser design, | 13-14 | 15-16 | 07-11 Feb-25. | 07-11 Feb-25. | Projector | |
| | | 2.2 Working principle, set up, process parameters, Advantages, limitations and applications of Evaporative pattern casing | 17-27 | 17-27 | 13, 14, 18 20, 21, 25 27, 28, 3 12, 19 Feb 25. | Same as. | | |

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|---|---|---|---|---|---|---|---|---|
| Advanced Casting Processes | | process (EPC), Centrifugal and pressure die casting, Slush casting, Hybrid EPC process, Vacuum EPC, Shell Molding Process. | | | | | | |
| | | **Tutorial Class/RemidialClass/Doubt Class** | | | | | | |
| | | **Assignment** | | | | | | |
| Unit-3.0<br>Advanced Welding and Forming Processes | (Approx. Hrs: P+L+T = 16) | 3.1 Working principle, setup, Process parameter Advantages, limitation and application- Orbital TIG welding, Electron beam welding (EBW), Laser beam welding (LBW), ultrasonic welding. Industrial adhesive and Adhesive bonding | 28-33 | 28-32 | 4,6,7 11,13,18 March 2023 | 4,6,7 11,13 March 2023 | | |
| | | 3.2 Advanced Metal forming-High energy rate forming, Electro-magnetic forming, explosive forming, Electro-hydraulic forming, Stretch forming, Contour roll forming. | 34-39 | 33-38 | 20,21,27 28 13,026 March 25 | 20,21,27 19,26 March 25 | | |
| | | **Tutorial Class/RemidialClass/Doubt Class** | | | | | | |
| | | **Assignment** | | | | | | |
| Unit 4.0<br>Gear Manufacturing | (Approx. Hrs: P+L+T = 14) | 4.1 Types of gear and Gear manufacturing methods. | 40-42 | 39-41 | 27,28,1,3 April 25 | 27,28,01 April-25 | | |
| | | 4.2 Gear Hobbing- Types and working principle of gear hobbing, Advantages, limitations and application. | 41-45 | 41-45 | 3,4,8,6 2,19 April-25 | 3,4,8,2,9 April 25 | | |
| | | 4.3 Gear Shaping-Gear Shaping by pinion cutter, Gear Shaping by rack cutter, Advantages, limitation and application of both the methods and comparison of gear hobbing and gear shaping. | 646-50 | 46-50 | 11,16,17 22,23 April 25 | 11,16,17 22,23 April-25 | | |
| | | 4.4 Gear Finishing methods-Need of gear finishing and different methods of gear finishing like:<br>a) Gear shaving<br>b) Gear grinding<br>c) Gear burnishing<br>d) Gear lapping<br>e) Gear honing<br>f) Gear tooth rounding | 51-52 | 51-52 | 24-25 April 25 | 24-25 April 25. | | |

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| | | **Tutorial Class/RemidialClass/Doubt Class** | | | | | | | |
| | | **Assignment** | | | | | | | |
| **Unit-5.0** | | **5.1 Additive manufacturing: 3D printing, Rapid prototyping.** | S3 | S3 | Unit (4) | | Notes | | |
| **Recent trends in CAM** | **(Approx. Hrs: P+L+T = 21)** | **5.2 Construction and working of 3D printer.** | | | 1 May 25 | 01 May 25 | Notes | | |
| | | **5.3 Type and properties of material for 3D printer and Rapid prototyping machine.** | S4 | S4 | 06 May 25 | 06 May 25 | Notes | | |
| | | **5.4 File format: STL (Stereo Lithography).** | | | | | | | |
| | | **5.5 3D printer software: part import, orientation, processing and printing.** | S5 | S5 | 07/05 May 25 | 07/May 25 | Notes. | | |
| | | **5.6 Computer Integrated Manufacturing (CIM): concept, definition, areas covered and benefits.** | | | | | | | |
| | | **5.7 Automation-Define, need of automation, high and low cost automation, examples of automations.** | S6 | S6 | 8 May 25 | 8 May 25 | Notes | | |
| | | **5.8 Types of Automation -Fixed (Hard) automation, programmable automations and Flexible automations (Soft).** | S7 | S7 | 9 May 25 | 9 May 25 | Notes | | |
| | | **5.9 Group Technology-concept, basis for developing part families, part classification and coding with example, concept of cellular manufacturing. Advantages and limitations.** | S8 – 60 | S8 | 13 May 25 | 13 May 25. | Notes | | |
| | | **Tutorial Class/RemidialClass/Doubt Class** | | | | | | | |
| | | **Assignment** | | Unit (5) | | | Notes. | | |

**Total Number Of Lecture Planed :-** 60

**Total Number Of Lecture Executed :-** 58

**Signature of Subject Faculty** 20/05/25.

**Date**.....

**H.O.D (Mechanical Engg.)**

**Date**.....