



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

PRODUCTION TECHNOLOGY

Course Code: GR15A207
II Year II Semester

L:3 T:2 P:0 C:4

Prerequisites: Basic knowledge in engineering workshop practices

Course Objectives

- To introduce the students the concepts of some basic manufacturing processes and fabrication techniques, such as metal casting, metal joining, metal forming and plastics component manufacture.
- To expose the students various production process including their typical use capabilities
- To provide a technical understanding of common processes to aid in appropriate material selection for a predetermined process

Course Outcomes

- The ability make students to produce products that are meaningful to them and describe their production procedure
- An ability to acquire the knowledge about the latest manufacturing technologies
- An ability to know about the latest Fabrication technologies
- The Industrial tours on production process influences the Enhancement of Product Knowledge
- Generating the ideas for the concerned Product establishment as an Entrepreneur
- An ability to Knowing the information about the Economic rate of Production

Unit-I

Metal Casting Processes: Sand casting – Sand moulds - Type of patterns – Pattern materials – Pattern allowances – Types of Moulding sand – Properties – Core making – Methods of Sand testing – Moulding machines – Types of moulding machines - Melting furnaces –Special casting processes – Shell, investment casting – Ceramic mould – Lost Wax process – Pressure die casting – Centrifugal casting – CO₂ process – Sand Casting defects – Inspection methods

Unit-II

Joining Processes Fusion welding processes – Types of Gas welding – Equipments used – Flame characteristics – Filler and Flux materials - Arc welding equipments - Electrodes –Coating and specifications – Principles of Resistance welding – Spot/butt, seam welding – Percussion welding - Gas metal arc welding – Flux cored – Submerged arc welding – Electro slag welding – TIG and MIG welding – Principle and application of special welding processes - Plasma arc welding – Thermit welding – Electron beam welding –Friction welding – Diffusion



welding – Weld defects – Brazing and soldering process –Methods and process capabilities – Filler materials and fluxes – Types of Adhesive bonding.

Unit-III

Bulk Deforming Processes: Hot working and cold working of metals – Forging processes – Open, impression and closed die forging – Characteristics of the process – Types of Forging Machines –Typical forging operations – Rolling of metals – Types of Rolling mills - Flat strip rolling– Shape rolling operations – Defects in rolled parts - Principle of rod and wire drawing -Tube drawing — Principles of Extrusion – Types of Extrusion – Hot and Cold extrusion— Equipments used.

Unit-IV

Sheet Metal Processes: Sheet metal characteristics - Typical shearing operations, bending and drawing operations – Stretch forming operations — Formability of sheet metal – Test methods– Working principle and application of special forming processes - Hydro forming –Rubber pad forming – Metal spinning – Introduction to Explosive forming, Magnetic pulse forming, Peen forming, Super plastic forming.

Unit-V

Manufacturing of Plastic Components: Types of plastics - Characteristics of the forming and shaping processes – Moulding of Thermoplastics – Working principles and typical applications of - Injection moulding –Plunger and screw machines – Compression moulding, Transfer moulding – Typical industrial applications – Introduction to Blow moulding – Rotational moulding – Film blowing – Extrusion - Thermoforming, - Bonding of Thermoplastics.

Teaching Methodology

1. Power point Presentations, Working models, white board & marker

Text Books

1. Hajra Choudhury, “Elements of Workshop Technology, Vol. I and II”, Media Promoters Pvt Ltd., Mumbai, 2001
2. S.Gowri, P.Hariharan, and A.Suresh Babu, “Manufacturing Technology 1”, Pearson Educatio, 2008.
3. P.N. Rao, ” Manufacturing Technology”, Tata McGraw-Hill Publishing Limited, IIEdition, 2002.

Reference Books

1. B.S. MagendranParashar & R.K. Mittal, ” Elements of Manufacturing Processes”, Prentice Hall of India, 2003.
2. P.C. Sharma, “A text book of production technology”, S. Chand and Company, IVEdition, 2003.
3. Begman, ‘Manufacturing Process’, John Wilely & Sons, VIII Edition, 2005.
4. SeropeKalpajian, Steven R.Schmid, Manufacturing Engineering and Technology, Pearson Education, Inc. 2002(Second Indian Reprint).
5. Beddoes.J and Bibby M.J, ‘Principles of Metal Manufacturing Processes’, Elsevier, 2006.
6. Rajput R.K, ‘A text book of Manufacturing Technology’, Lakshmi Publications, 2007.