| Branch Course Code Course Outcoo Learning Outco Contents Method of Assessmen Learning Outco Contents Method of Assessmen Learning Outco Contents Method of Assessmen Method of Assessmen | 30 ome 1 ome 1 fint ome 2 | Explai Classi mecha Introd materi | fy engineering manical properties. | MATERIAL SCII aterials and their propaterials on the basis of | perties. | | Marks | | | | |
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| Course Outcom Learning Outcom Contents Method of Assessmen Learning Outcom Contents Method of Assessmen Learning Outcom Contents Method of Assessmen Learning Outcom Contents | ome 1 ome 1 f nt ome 2 | Expla: Classi mecha Introd materi | in engineering manical properties. | aterials and their propagaterials on the basis of the bas | perties. | Teach Hrs | Marks | | | | |
| Contents Method of Assessmen Learning Outco Contents Method of Assessmen Learning Outco Contents Method of Assessmen Learning Outco Contents | ome 1 f nt ome 2 | Classi mecha Introd materi | fy engineering manical properties. | aterials on the basis or | of | Hrs | | | | | |
| Contents Method of Assessmen Learning Outco Contents Method of Assessmen Learning Outco Contents Method of Method | f nt ome 2 | Introd materi | anical properties. auction to enginee | ering materials, classi | | 05 | 0.5 | | | | |
| Method of Assessmen Learning Outco Contents Method of Assessmen Learning Outco Contents Method of | f nt ome 2 | materi | | | fication of e | | 05 | | | | |
| Assessmen Learning Outco Contents Method of Assessmen Learning Outco Contents Method of | ome 2 | Illustr | | mamear properties | Introduction to engineering materials, classification of engineering materials and their mechanical properties | | | | | | |
| Contents Method of Assessmen Learning Outco Contents Method of | ome 2 | Illustr | Paper pen test | | | | | | | | |
| Method of Assessmen Learning Outco Contents Method of | | | ate seven basic c | rystal systems. | | 06 | 08 | | | | |
| Assessmen Learning Outco Contents Method of | | Unit cell and space lattice, seven basic crystal systems- triclinic, monoclinic, orthorhombic, tetragonal, trigonal, hexagonal, and cubic. | | | | | | | | | |
| Learning Outco Contents Method of | | Theory exam | | | | | | | | | |
| Contents Method of | | Expla | Explain crystal structures of metallic elements. 05 08 | | | | | | | | |
| Method of | ome 5 | Crystal structure for metallic elements: simple cubic, BCC, FCC, HCP | | | | | | | | | |
| | | and its coordination number, crystal imperfections and its effect on | | | | | | | | | |
| | | mechanical properties of metals. | | | | | | | | | |
| Assessmen | | Theory exam | | | | | | | | | |
| | nt | F 1 | • • 1 | 1111 11 11 7 | | TD 1 | | | | | |
| Course Outcome 2 | | Explain iron carbon equilibrium diagram, TTT curve, heat treatment processes Hrs Marks | | | | | | | | | |
| Learning Outcome 1 | | Explain solidification, re–crystallization, phase rule, 05 05 | | | | | | | | | |
| | | lever rule. | | | | | | | | | |
| | | Process of nucleation and grain growth, ingot solidification, dendritic | | | | | | | | | |
| Contents and columnar structure, segregation of impurit boundaries, Re-crystallization, phase rule, applications. | | | | | | _ | nd grain and its | | | | |
| Method of | | | | Paper pen test | | | | | | | |
| Assessmen | <u>it</u> | Intern | ret Iron-Carbon e | equilibrium diagram, | TTT | 08 | 08 | | | | |
| Learning Outco | ome 2 | curve. | | quinorium diagram, | 111 | 00 | 00 | | | | |
| Contents | | Phase transformations— Eutectic Eutectoid, Peritectic, Peritectoid Iron-carbon equilibrium diagram, The solidification and cooling of carbon steels and its structures, effect of carbon content on mechanical properties of steel. TTT curve. | | | | | | | | | |
| Method of | | | | Theory exam | | | | | | | |
| Assessmen | | Evalo | in haat traatmant | processes for motels | | 08 | 10 | | | | |
| Learning Outco | ome 3 | - | | processes for metals. tment, thermal proces | | | | | | | |
| | | Objectives of heat treatment, thermal processes: annealing, normalizing, hardening and tempering. | | | | | | | | | |
| Contents | | Hardening process: Surface hardening, flame hardening, case hardening | | | | | | | | | |
| | | | | imitations and advant | • | _ | diums | | | | |
| | | and their effect on hardness, Hardening defects, hardenability. | | | | | | | | | |
| Method of Assessmen | | | | Theory exam | Tets, maracine | aomity. | | | | | |

| RGPV (DIPLOMA WING) BHOPAL | | | ING) | OBE CURRIC | FORMAT-3 | | Sheet No. 1/3 | | |
|-------------------------------|---|--|--|------------|-------------|-------|------------------|-----|--|
| Branch | | M | ECHANICAL ENGINEERING Semester | | | | | III | |
| Course (| Code | 30 | Course Name MATERIAL SCIENCE & ENGINEERING | | | | | | |
| Course Outcome 3 | | Select ferrous and non ferrous metals and its alloy for engineering applications. | | | Teac Hrs | Marke | | | |
| Learning Outcome 1 | | Explain properties and uses of ferrous metals and its alloys. | | | | | 10 | | |
| Contents | | Cast irons, their properties and uses, composition and uses of plain carbon steels, effect of impurities, Alloy steels and its alloying elements, effects of alloying elements on properties and uses of steels. | | | | | | | |
| Method of Assessment | | | Paper pen test | | | | | | |
| Learning Outcome 2 | | Explain properties and uses of non ferrous metals and los lits alloys. | | | | | | | |
| Co | Copper and its alloy: brass, bronze, gun metal Its composition Properties and uses. Aluminium and its Alloys :Hindalium, Duralumin, Y-alloy its composition, properties and uses Nickel and its alloy: nickel-molybdenum, nickel-chromium Its composition, Properties and uses Zinc and its alloy: zinc-Al casting alloy, zinc-lead alloy Its composition. | | | | | | | | |
| | Properties and uses Method of Assessment Theory exam | | | | | | , | | |

| RGPV (DIPLOMA WING) BHOPAL | | | ING) | OBE CURRI | FORM | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Sheet No. 1/3 | |
|--|--|----|--|--------------|---------|---|------------------|--|
| Branch | | M | ECHA | NICAL ENGINI | EERING | Semester III | | |
| Course Code 303 Course Name MATERIAL SCI | | | | ENCE & EI | NGINEI | ERING | | |
| Course Outcome 4 | | Ez | explain properties of non metallic materials a plastics. | | als and | Teach Hrs | Marks | |

| Learning Outcome 1 | Describe the properties and uses of ceramics, rubbers, | 06 | 08 | | | | |
|---------------------------|--|----|----|--|--|--|--|
| Learning Outcome 1 | glasses | | | | | | |
| Contents | Introduction, classification, properties, uses of Ceramic Refractories, Rubbers, glasses | | | | | | |
| Contents | | | | | | | |
| Method of | Theory exam | | | | | | |
| Assessment | | | | | | | |
| Learning Outcome 2 | Compare thermosetting plastic and thermoplastic. | | 06 | | | | |
| Learning Outcome 2 | | | | | | | |
| Contents | Properties, Composition, and uses of plastics: thermosetting plastic and | | | | | | |
| Contents | thermoplastic | | | | | | |
| Method of | Theory exam | | | | | | |
| Assessment | | | | | | | |
| Learning Outcome 3 | Explain plastic processing methods. | 06 | 10 | | | | |
| | Types, uses of different plastic processing methods: | | | | | | |
| Contents | injection moulding, blow moulding compression | | | | | | |
| | moulding, extrusion, forming, casting | | | | | | |
| Method of | Term Work | | | | | | |
| Assessment | | | | | | | |

| RGPV (DIPLOMA WING) BHOPAL | | | ING) | OBE CURRI | FORMAT-3 | | Sheet No. 1/3 | | | |
|-------------------------------|--------------------------------|---|--|-----------|----------|--------------------------------|------------------|---------|--|--|
| Branch | | M | ECHANICAL ENGINEERING Semester III | | | | | III | | |
| Course | Course Code 303 Course Name MA | | | | | MATERIAL SCIENCE & ENGINEERING | | | | |
| Course Outcome 5 | | | Select appropriate metal preservation techniques in a given situation. | | | | Teach Hrs | n Marks | | |
| Learning Outcome 1 | | | Explain corrosion and its minimization techniques. | | | 04 | 05 | | | |
| Contents | | Nature of corrosion and its causes, methods of minimizing corrosion | | | | | | | | |
| Method of | | Theory exam | | | | | | | | |
| Assessment | | | | _ | | | | | | |
| Learning Outcome 2 | | Describe different metal preservation techniques. | | | | 05 | 07 | | | |
| Contents | | Surface coating techniques: hot dipping, electroplating, spraying, diffusion coating, cleaning and finishing of metal surfaces. | | | | | | | | |
| Method of | | | Theory exam | | | | | | | |
| Assessment | | | | | • | | | | | |