

| RGPV (DIPLOMA WING) BHOPAL | | OBE CURRICULUM FOR THE COURSE | | FORMAT- 3 | Sheet No. 1/5 |
|--------------------------------------|--|----------------------------------|-----------------------------------|------------------|------------------|
| Branch | Electrical Engineering | | Semester | 5 | |
| Course Code | 503 | Course Name | Estimating, Costing & Contracting | | |
| Course Outcome 1 | Use elements of estimating & costing to prepare contract related documents. | | | Teach Hrs. | Marks |
| Learning Outcome E0150311 | Describe the meaning & purpose of estimating and costing. [Cognitive Domain] | | | 03 | 06 |
| Contents | <ul style="list-style-type: none"> ➤ Estimating and costing: Meaning and purpose, rough estimate, detailed estimate, supplementary estimate, annual maintenance estimate and revised estimate. ➤ Elements of estimating and costing: List of materials and their cost, labour charges, overhead charges, storage charges, inspection charges, contingency charges, tools & plant charges, other charges. | | | | |
| Method of Assessment | External: End semester theory examination (Pen paper test) | | | | |
| Learning Outcome E0150312 | Explain the methods of contracting and purchase procedure. [Cognitive Domain] | | | 05 | 10 |
| Contents | <ul style="list-style-type: none"> ➤ Contracts: Concepts and types. ➤ Contractor and their role. ➤ Order format, placing of purchasing order. ➤ Principles of planning, organizing, execution of works and preparation of work completion report, Billing of work. ➤ Schedule of rates (SOR). ➤ Quotations and tenders: Types, Procedural steps for Quotation and tendering methods. | | | | |
| Method of Assessment | Internal: Mid semester-I theory examination (Pen paper test) | | | | |
| Learning Outcome E0150313 | Develop an enquiry form for inviting Quotations and Tender documents. [Psychomotor Domain] | | | 05 | 10 |
| Contents | <ul style="list-style-type: none"> ➤ To prepare an enquiry form for quotations. ➤ To prepare tender documents. ➤ To prepare comparative statement for technical and financial bid. | | | | |
| Method of Assessment | Internal: Performance of given task and viva voce. | | | | |

| RGPV (DIPLOMA WING) BHOPAL | | OBE CURRICULUM FOR THE COURSE | | FORMAT-3 | Sheet No. 2/5 |
|----------------------------------|--|----------------------------------|-----------------------------------|------------|------------------|
| Branch | Electrical Engineering | | Semester | 5 | |
| Course Code | 503 | Course Name | Estimating, Costing & Contracting | | |
| Course Outcome 2 | Estimate the quantity of items and cost for non-Industrial electrical installations. | | | Teach Hrs. | Marks |
| Learning Outcome E0150321 | Make use of Indian Electricity rules for wiring of non-industrial electrical Installation. [Cognitive Domain] | | | 03 | 05 |
| Contents | <ul style="list-style-type: none"> ➤ Types of non-industrial electrical installations: Residential buildings, Office buildings, shopping and commercial complex. ➤ Wiring installation, inspection & testing as per IE Rules 2003 and their amendments. | | | | |
| Method of Assessment | Internal: Quiz & Assignment - I | | | | |
| Learning Outcome E0150322 | Assess the quantity of materials with specification and their cost for non-Industrial Installation. [Cognitive Domain] | | | 09 | 17 |
| Contents | <ul style="list-style-type: none"> ➤ Design procedure of installation: Steps involved in detail estimate and cost of non-industrial electrical installations. ➤ Preparation of estimate for residential buildings, office buildings, shopping and commercial complex. ➤ Estimation of earthing installations. | | | | |
| Method of Assessment | External: End semester theory examination (Pen paper test) | | | | |
| Learning Outcome E0150323 | Prepare estimate for single phase and three phase service connections for residential and commercial buildings. [Psychomotor Domain] | | | 05 | 10 |
| Contents | <ul style="list-style-type: none"> ➤ Evaluate quantity of items required and their cost for single phase service connection of residential building. ➤ Evaluate quantity of items required and their cost for three phase service connection of commercial building. | | | | |
| Method of Assessment | External: Performance of given task and viva voce. | | | | |

| RGPV (DIPLOMA WING) BHOPAL | | OBE CURRICULUM FOR THE COURSE | | FORMAT- 3 | Sheet No. 3/5 |
|----------------------------------|---|----------------------------------|-----------------------------------|------------------|------------------|
| Branch | Electrical Engineering | | Semester | 5 | |
| Course Code | 503 | Course Name | Estimating, Costing & Contracting | | |
| Course Outcome 3 | Determine the quantity of material and cost for single phase and three phase motor connections. | | | Teach Hrs. | Marks |
| Learning Outcome E0150331 | Classify Industrial installations and sketch the wiring diagram of Motor connections. [Cognitive Domain] | | | 05 | 10 |
| Contents | <ul style="list-style-type: none"> ➤ Classification of industrial installations based on connected load. ➤ Sketch the wiring diagram for single phase and three phase motor connections. ➤ Design consideration in industrial installations. ➤ Procedural steps for industrial installation. | | | | |
| Method of Assessment | Internal: Mid semester-II theory examination (Pen paper test) | | | | |
| Learning Outcome E0150332 | Prepare estimate to accomplish connection for the given motor installation. [Psychomotor Domain] | | | 05 | 10 |
| Contents | <ul style="list-style-type: none"> ➤ To evaluate the quantity of material with specification and cost for connection of 15HP three phase Induction motor to be installed in a small industrial unit. ➤ To evaluate the quantity of material with specification and cost for connection of 3HP single phase Induction motor to be installed in a workshop. | | | | |
| Method of Assessment | External: Performance of given task and viva voce. | | | | |
| Learning Outcome E0150333 | Assess the quantity of material with specification for connection of Induction motor used in various applications. [Cognitive Domain] | | | 07 | 15 |
| Contents | <p>Wiring layout of Induction motor connection , estimate the quantity of material , specification, cable size and cost for :</p> <ul style="list-style-type: none"> ➤ Agriculture pump set ➤ Flour mill ➤ Saw mill | | | | |
| Method of Assessment | External: End semester theory examination (Pen paper test) | | | | |

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| Branch | Electrical Engineering | | Semester | 5 | |
| Course Code | 503 | Course Name | Estimating, Costing & Contracting | | |
| Course Outcome 4 | Choose an appropriate street lighting scheme. | | | Teach Hrs. | Marks |
| Learning Outcome E0150341 | Classify outdoor installations and select suitable lightning scheme for street lighting installation. [Cognitive Domain] | | | 03 | 07 |
| Contents | <ul style="list-style-type: none"> ➤ Classification of outdoor installations ➤ Street lighting system ➤ Public lighting system ➤ Installation of pole structures for lighting. ➤ Selection of equipment's according to sources used in street light installations. | | | | |
| Method of Assessment | External: End semester theory examination (Pen paper test) | | | | |
| Learning Outcome E0150342 | Select the suitable cable and control strategy for street lighting scheme. [Cognitive Domain] | | | 03 | 05 |
| Contents | <ul style="list-style-type: none"> ➤ Cables, recommended types and sizes of cable. ➤ Control strategies for street light installation. | | | | |
| Method of Assessment | Internal: Quiz & Assignment - II | | | | |
| Learning Outcome E0150343 | Prepare estimate of energy efficient street lighting system. [Psychomotor Domain] | | | 05 | 10 |
| Contents | <ul style="list-style-type: none"> ➤ To design a suitable street lighting system considering energy conservation and economical aspects for a given site. ➤ Visit to any street lighting scheme of small township/colony under- construction stage. | | | | |
| Method of Assessment | Internal: Performance of given task, viva voce & report submission. | | | | |

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| Branch | Electrical Engineering | | Semester | 5 | |
| Course Code | 503 | Course Name | Estimating, Costing & Contracting | | |
| Course Outcome 5 | Estimate the quantity of items for erection of lines and installation of distribution sub-stations. | | Teach Hrs. | Marks | |
| Learning Outcome E0150351 | Classify various types of sub-stations and lines. [Cognitive Domain] | | 03 | 07 | |
| Contents | <ul style="list-style-type: none"> ➤ Types of substations, their line diagram, calculation of load and determining the rating of distribution transformer. ➤ Introduction to overhead and underground distribution line. ➤ Route Survey for erection of LT & HT line. | | | | |
| Method of Assessment | External: End semester theory examination (Pen paper test) | | | | |
| Learning Outcome E0150352 | Estimate the quantity of items for lines and substations. [Cognitive Domain] | | 09 | 18 | |
| Contents | <p>Overhead and Underground lines (LT and HT):</p> <ul style="list-style-type: none"> ➤ Conductors and cables. ➤ Factors determining selection of conductors and power Cables. ➤ Method of cable laying and cable termination. ➤ Estimation of required items with specification and costing. (as per SOR) <p>11/0.4kV and 33/0.4kV Distribution substations:</p> <ul style="list-style-type: none"> ➤ Structure diagram. ➤ Estimation of load. ➤ Determination of rating of Distribution Transformer. ➤ Estimation of required items with specification and costing. (as per SOR) | | | | |
| Method of Assessment | External: End semester theory examination (Pen paper test) | | | | |
| Learning Outcome E0150353 | Prepare an estimate with cost for Pole Mounted Sub-station of given Transformer rating. [Psychomotor Domain] | | 05 | 10 | |
| Contents | <ul style="list-style-type: none"> ➤ To estimate the quantity of items with specification and cost for Pole mounted Substation of 63 kVA. ➤ To estimate the quantity of items with specification and cost for foundation mounted Substation of 200 kVA. | | | | |
| Method of Assessment | External: Performance of given task and viva voce. | | | | |

Reference Books:

| <u>S.N.</u> | <u>Title & Publication</u> | <u>Authors</u> |
|--------------------|---|---|
| 1. | A Course in Electrical Installation Estimating and Costing ISBN 10: 935014279113: 978-9350142790. | J. B. Gupta, S.K. Kataria |
| 2. | Electrical Estimating and Costing, ISBN 13:1234567150995. Dhanpat Rai and Sons | Surjit Singh, Ravi Deep Singh |
| 3. | Electrical Design Estimating and Costing ISBN: 978-81-224-0363-3. New Age International Publisher First, Reprint 2010 | K. B. Raina, Dr. S. K. Bhattacharya |
| 4. | Field Work Hand Book For Construction of E.H.V. /H.V. /L.T. Lines and Sub Stations. Cooperative Stores S.V. Polytechnic College, Indore | Ashok Kumar Gupta & Hari Prasad Dishoriya |
| 5. | Electrical Wiring Estimating and Costing, Khanna Publishers. | S. L. Uppal and G. C. Garg |
| 6. | Electrical Estimating and Costing, ISBN 13: 9780074624784. Tata Mc- Graw Hill Publishing Co. Ltd | Allagappan, N. S. Ekambarram |
| 7. | Code of Practice for Electrical Wiring Installation. Bureau of Indian Standard. IS: 732-1989 | - |
| 8. | National Electrical Code 2011. Bureau of Indian Standard. SP-30:2011, | - |