

## RESEARCH METHODOLOGY

|                                        |          |                                 |       |                      |        |
|----------------------------------------|----------|---------------------------------|-------|----------------------|--------|
| <b>Course Code</b>                     | 23AC1602 | <b>Year</b>                     | III   | <b>Semester</b>      | II     |
| <b>Course Category</b>                 | Audit    | <b>Branch</b>                   | EEE   | <b>Course Type</b>   | Theory |
| <b>Credits</b>                         | -        | <b>L-T-P</b>                    | 2-0-0 | <b>Prerequisites</b> | -      |
| <b>Continuous Internal Evaluation:</b> | 30       | <b>Semester End Evaluation:</b> | 0     | <b>Total Marks:</b>  | 30     |

| Course Outcomes                                                       |                                                                                                                                 |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Upon successful completion of the course, the student will be able to |                                                                                                                                 |
| <b>CO1</b>                                                            | Apply research problem-solving approaches by formulating clear objectives and selecting appropriate data collection methods. L3 |
| <b>CO2</b>                                                            | Analyze literature and apply ethical principles to conduct responsible research. L4                                             |
| <b>CO3</b>                                                            | Analyze various types of Intellectual Property Rights (IPRs) and apply them to protect innovative research. L4                  |
| <b>CO4</b>                                                            | Apply the concepts of patent rights and analyze their implications for licensing, technology transfer, and innovation. L3       |
| <b>CO5</b>                                                            | Evaluate emerging trends and developments in IPR including case studies related to advanced technological innovations. L4       |

| Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low) |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                                                                                                                               | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1                                                                                                                           |     | 3   |     | 3   |     |     |     |     |     |      |      |      |      |      |
| CO2                                                                                                                           |     | 3   |     | 3   |     |     |     | 2   |     |      |      |      |      |      |
| CO3                                                                                                                           | 2   |     |     |     |     | 2   |     | 3   |     |      |      |      |      |      |
| CO4                                                                                                                           |     |     |     | 3   |     | 2   |     | 2   |     |      |      |      |      |      |
| CO5                                                                                                                           |     |     |     | 3   |     |     |     | 3   |     |      |      |      |      |      |

| Syllabus |                                                                                                                                                                                                                                                                                                                                                                |           |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Unit No. | Contents                                                                                                                                                                                                                                                                                                                                                       | Mapped CO |
| I        | <b>Research problem:</b> Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations | CO1       |
| II       | <b>Literature study:</b> Effective literature studies approaches, analysis Plagiarism, Research ethics.<br><b>Technical writing:</b> Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation                                                                                       | CO2       |

|                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                        |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                                                                                                                                                                                                                                                                                                                                                                                                                                              | and assessment by a review committee.                                                                                                                                                                                                                                                                                                  |     |
| III                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Nature of Intellectual Property:</b> Patents, Designs, Trade and Copyright.<br><b>Process of Patenting and Development:</b> technological research, innovation, patenting, development.<br><b>International Scenario:</b> International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT. | CO3 |
| IV                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Patent Rights:</b> Scope of Patent Rights, Licensing and transfer of technology, Patent information and databases, Geographical Indications.                                                                                                                                                                                        | CO4 |
| V                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>New Developments in IPR:</b> Administration of Patent System, New developments in IPR; IPR of Biological Systems, Computer Software etc, Traditional knowledge Case Studies, IPR and IITs.                                                                                                                                          | CO5 |
| <b>Learning Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                        |     |
| <b>Text Books</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                        |     |
| 1. “Research methodology: an introduction for science & engineering students”, Stuart Melville and Wayne Goddard<br>2. “Research Methodology: An Introduction”, Wayne Goddard and Stuart Melville<br>3. “Research Methodology: A Step by Step Guide for beginners”, Ranjit Kumar, 2nd Edition                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                        |     |
| <b>Reference Books</b>                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                        |     |
| 1. “Resisting Intellectual Property”, Halbert, Taylor & Francis Ltd ,2007.<br>2. “Industrial Design”, Mayall, McGraw Hill, 1992.<br>3. “Product Design”, Niebel, McGraw Hill, 1974.<br>4. “Introduction to Design”, Asimov, Prentice Hall, 1962.<br>5. “Intellectual Property in New Technological Age”, Robert P. Merges, Peter S. Menell, Mark A. Lemley, 2016.<br>6. “Intellectual Property Rights Under WTO”, T. Ramappa, S. Chand, 2008 |                                                                                                                                                                                                                                                                                                                                        |     |