

## REGULATION – 2018

**MC18081 INTRODUCTION TO RESEARCH METHODOLOGY AND IPR** **L T P C**  
**2 0 0 2**

(Common to M.E Computer Science and Engineering (Networks), M.E. Communication Systems, M.E. industrial automation and robotics, M.E. Internal Combustion Engineering, M.E. Mechatronics Engineering, M.E. Power Electronics and Drives, M.E.A applied Electronics, M.E. Computer Aided Design, M.TECH. Chemical Engineering, and M.E Computer Science and Engineering)

### **OBJECTIVES:**

- To impart knowledge on formulation of research problem, research methodology, ethics involved in doing research and importance of IPR protection.

### **UNIT I RESEARCH METHODOLOGY** **6**

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, Plagiarism, Research ethics

### **UNIT II RESULTS AND ANALYSIS** **6**

Importance and scientific methodology in recording results, importance of negative results, different ways of recording, industrial requirement, artifacts versus true results, types of analysis (analytical, objective, subjective), outcome as new idea, hypothesis, concept, theory, model etc.

### **UNIT III TECHNICAL WRITING** **6**

Effective technical writing, how to write a manuscript/ responses to reviewers comments, preparation of research article/ research report, Writing a Research Proposal - presentation and assessment by a review committee

### **UNIT IV INTELLECTUAL PROPERTY RIGHTS** **6**

Nature of Intellectual Property: Patents, Designs, Trade Mark and Copyright. Process of Patenting and Development: technological research, innovation, patenting & development. Procedure for grants of patents, Patenting under PCT.

### **UNIT V PATENT RIGHTS AND NEW DEVELOPMENTS IN IPR** **6**

Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System.

**TOTAL: 30 PERIODS**

### **OUTCOMES:**

At the end of this course, students will be able to

- Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
- Understand research problem formulation & Analyze research related information and Follow research ethics

- Correlate the results of any research article with other published results. Write a review article in the field of engineering.
- Appreciate the importance of IPR and protect their intellectual property. Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits

#### **TEXT BOOKS:**

1. Ranjit Kumar, Research Methodology- A step by step guide for beginners, Pearson Education, Australia, 2005.
2. Ann M. Korner, Guide to Publishing a Scientific paper, Bioscript Press 2004.
3. T. Ramappa, “Intellectual Property Rights Under WTO”, S. Chand, 2008

#### **REFERENCES:**

1. Kothari, C. R. Research Methodology - Methods and Techniques, New Age International publishers, New Delhi, 2004.
2. Stuart Melville and Wayne Goddard, “Research methodology: an introduction for science & engineering students’, Juta & Company, 1996.
3. Robert P. Merges, Peter S. Menell and Mark A. Lemley, “Intellectual Property in New Technological Age”, Aspen Publishers, 2016.
4. Halbert, “Resisting Intellectual Property”, Taylor & Francis Ltd ,2007.
5. Mayall , “Industrial Design”, McGraw Hill, 1992.
6. Niebel , “Product Design”, McGraw Hill, 1974.
7. Asimov , “Introduction to Design”, Prentice Hall, 1962.

#### **WEB RESOURCES:**

1. <https://nptel.ac.in/courses/106/105/106105077/>

## **BY18204 RESEARCH AND RESEARCH METHODOLOGY IN BIOTECHNOLOGY**

(M.Tech Biotechnology)

**L T P C**

**3 0 0 3**

### **UNIT I RESEARCH AND ITS METHODOLOGIES (WITH EXAMPLES)**

**9**

Objectives of research, research process – observation, analysis, inference, hypothesis, axiom, theory, experimentation, types of research (basic, applied, qualitative, quantitative, analytical etc). Features of translational research, the concept of laboratory to market (bench to public) and Industrial R&D.

### **UNIT II RESEARCH IN BIOTECHNOLOGY – AN OVERVIEW**

**9**

Biological systems and their characteristic: Type and outcome of research, Exploratory and product-oriented research in various fields of biotechnology (health, agri, food, industrial etc) – types of expertise and facilities required. Interdisciplinary nature of biotech research, sources of literature for biotech research.

### **UNIT III EXPERIMENTAL RESEARCH: BASIC CONCEPTS IN DESIGN AND METHODOLOGY**

**9**

Precision, accuracy, sensitivity and specificity; variables, biochemical measurements, types of measurements, enzymes and enzymatic analysis, antibodies and immunoassays, instrumental methods, bioinformatics and computation, experimental planning – general guidelines.

### **UNIT IV RESULTS AND ANALYSIS**

**9**

Importance and scientific methodology in recording results, importance of negative results, different ways of recording, industrial requirement, artifacts versus true results, types of analysis (analytical, objective, subjective) and cross verification, correlation with published results, discussion, outcome as new idea, hypothesis, concept, theory, model etc.

### **UNIT V SCIENTIFIC AND TECHNICAL PUBLICATION**

**9**

Different types of scientific and technical publications in the area of biotechnology, and their specifications, Ways to protect intellectual property – Patents, technical writing skills, definition and importance of impact factor and citation index - assignment in technical writing.

**TOTAL: 45 PERIODS**

### **REFERENCES:**

1. Marczyk, G.R., DeMatteo, D. & Festinger, D. Essentials of Research Design and Methodology, John Wiley & Sons Publishers Inc, 2005.
2. Segel, I.H. Biochemical Calculations: How to Solve Mathematical Problems in General Biochemistry, 2nd Ed., John Wiley & Sons Publishers Inc, 1976.
3. Korner, A.M. Guide to Publishing a Scientific paper, Bioscript Press, 2004.