

ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ



# University of Mysore

(Estd.1916)

## Ph. D. in ELECTRONICS



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UNIVERSITY OF MYSORE


Department of Studies in Electronics

Postgraduate Centre, Hemagangotri, University of Mysore, Hassan

Ph. D. in ELECTRONICS

Regulations and Syllabus

Ph. D. in ELECTRONICS

  
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**UNIVERSITY OF MYSORE**  
**GUIDELINES AND REGULATIONS**  
**LEADING TO**  
**PH. D. IN ELECTRONICS**

**Programme Details**

Name of the Department : Department of Studies in Electronics

Subject : Electronics & Technology

Faculty : Science and Technology

Name of the Programme : Ph. D.

**Ph. D. PROGRAM IN ELECTRONICS**

**Programme Outcome**

- The objective of the Ph.D. programme in Electronics is to encourage research scholars to carryout research work in the field of current trends in Electronics and its related fields and give significant research contributions to the field.
- The research filed is chosen such that the outcome of the research will be of useful for the wellness of the Mankind, Society, Environment, and the Economic Growth of the Country.
- The research scholar carryout the research in the chosen field of Electronics under the supervision of the Research Guide.
- During the initial stages of the programme, the research scholar will acquire the knowledge of literature review, current research status in the field, identify the limitations in the existing research work and identification of the problem statements.
- Based on the literature review and current status of the research in the chosen field of research, the research scholar will propose title and objectives of the proposed research work with the consultation of the Research Guide.
- After successfully completing the Ph.D. Programme, the candidate will have in-depth knowledge in the undertaken research filed.
- At the end of the research work, the research scholar will propose a Product/Model/ Hypothesis that will be of very useful to Society.

**COURSE-I: RESEARCH METHODOLOGY**

**Course Outcome**

- The objective of this course is to enable the research scholar to understand different stages of



research and thereby guiding the student to follow proper path to accomplish the defined research objectives.

- In the first five units of the syllabus, importance of research, different types of research approach, research problem defining, literature review, research design methods, the skill of research article publication and thesis preparation are taught.
- The research scholar will learn MATLAB and Lab View software programming tools, which are commonly used in the research.
- The research scholar will acquire the knowledge of principle of operation, working principle and methods of using important scientific instruments which are commonly used to characterize the synthesized materials and to validate the designed systems.

#### **Pedagogy**

- The course has Lecture and Tutorial components.
- Research scholar has to write and execute programs to solve problems using MATLAB and Lab View software. This is to make the scholar to better understand these software tools.
- The research scholar has to give the seminar presentation based on the review of books and research articles.
- Assignments, seminars, and periodic tests are conducted to evaluate the research scholar's understanding of the course.

#### **COURSE CONTENTS**

##### **Unit I : Introduction**

- Meaning of Research. Objectives of Research. Motivation in Research. Types of Research. Research Approaches. Significance of Research. Research Methods versus Methodology. Research and Scientific Method. Importance of Knowing How Research is Done. Research Process. Criteria of Good Research, Problems Encountered by Researchers in India.

##### **Unit 2: Defining the Research Problem**

- What is a Research Problem? Selecting the Problem. Necessity of Defining the Problem. Technique Involved in Defining a Problem. An Illustration.

##### **Unit 3: Research Design**

- Meaning of Research Design. Need for Research Design. Features of a Good Design. Important Concepts Relating to Research Design. Different Research Designs. Basic Principles of Experimental Designs.

##### **Unit 4: Publishing a Scientific Paper**

- Publication & Peer Review: Deciding to Publish, Submitting Your Paper After Submission, Overview of Peer Review, Purpose of Peer Review How It Works The Role of Editor Limitations and Issues. Writing a Scientific Manuscript: The Scientific: The Abstract, Introduction, The Methods & Materials Section, The Results Section The Discussion Section Figures, Tables, Equations, and References, Writing a Literature Review

##### **Unit 5: Interpretation and Report Writing**

- Meaning of Interpretation, Why Interpretation? Technique of Interpretation: Precaution in Interpretation Significance of Report Writing. Different Steps in Writing Report. Layout of the Research Report. Types of Reports. Oral Presentation. Mechanics of Writing a Research Report. Precautions for Writing Research Reports. Conclusions.

#### Unit 6: MATLAB

- Matrix algebra, Data analysis, data interpolation, Polynomials, cubic splines, Fourier analysis, optimization, Integration and differentiation, Differential equations, Two dimensional graphics, three dimensional graphics, using color and light, images movies and sounds, printing and exporting graphics, handling graphics, graphical user interface(GUI).

#### Unit 7: Lab VIEW

- Visual instruments. Graphical environment. Building front panel. Building a block diagram. Math Script, Grouping data: Array & Cluster. Debugging and Profiling, VIs.

#### Unit 8: Instruments

- Working principle and types of measurements from SEM, TEM, AFM, EDAX, HRTEM, and XRD. Block diagram, working principle and types of measurements from Digital Storage Oscilloscope, Spectrum analyzer, Logic Analyzer, Vector Network Analyzer.

#### Reference

- (1) C.R.Kothari, "*Research Methodology: Methods and Techniques*", New Age International Publishers, 1<sup>st</sup> Edition, 2004.
- (2) B.S. Murthy, P Shankar, Baldev Raj, B.B Rath, James Murday "*Textbook of and Nanotechnology*". University Press (India) Private Limited, 1<sup>st</sup> edition, 2012.
- (3) <http://www.jyi.org/resources/320/Guide%20to%20Science%20Writing.pdf>
- (4) Duane Hanselman, Brauce Littlefield "Mastering MATLAB 7", Pearson, 2008
- (5) Nasser Ketharnavaz, "*Digital Signal Processing System Design: Lab VIEW Based Hybrid Programming*" Academic press, 2<sup>nd</sup> edition, 2008.

#### COURSE-II: LITERATURE REVIEW

#### COURSE OUTCOMES

- During the literature review, the research scholar will understand the current status of research in his/her research area
- Laminations and problems in the intended research field are identified
- In consultation with the research guide, the research scholar proposes the title, problem statements, research methodology, etc., of the planned research work.
- Acquires additional skills required to carry out the research through reading and by discussing with the research guide.