

ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ



University of Mysore  
(Estd. 1916)

**Ph.D in COMPUTER SCIENCE**



UNIVERSITY OF MYSORE  
Department of Studies in Computer Science  
Manasagangotri, Mysuru-570 006

Regulations and Syllabus  
Ph.D. in COMPUTER SCIENCE AND TECHNOLOGY

UNIVERSITY OF MYSORE  
GUIDELINES AND REGULATIONS LEADING TO  
**Ph.D. IN COMPUTER SCIENCE**

Programme Details

Name of the Department	:	Department of Studies Computer Science
Subject	:	COMPUTER SCIENCE AND TECHNOLOGY
Faculty	:	Science and Technology
Name of the Programme	:	Ph.D.

**Program Outcome**

After successful completion of Ph.D degree, the graduates will be able to:

- Understand the current state-of-the-art in the individual research area, and the ability to appropriately employ methods and existing research results in the development of new knowledge, theories and methods.
- Acquire the knowledge to argue the merits, limitations, and possibilities of new developments in the chosen research domain within the discipline of Computer Science.
- Apply the current abstract research and methods within the chosen research domain to specific problems in creative and innovative ways.
- Select appropriate research methods and techniques suitable for the candidate's research field, perform the planning and preparation as well as to lead and manage research projects in the area of Computer Science, in academic, government or industrial settings.
- Successfully conduct and manage research undertakings which may include aspects not only from the chosen research domain but also from other domains within the discipline of Computer Science and elements of interdisciplinary research involving diverse groups of individuals.
- To organize and participate in research and development through established national and international research frameworks and to see what everyone has seen and to think what nobody else has thought.

**COURSE-I: RESEARCH METHODOLOGY**

**Course Description:**

This course will provide an opportunity for students to establish or advance their understanding of research through critical exploration of research language, ethics, and approaches. The course introduces the language of research, ethical principles and challenges, and the elements of the research process within quantitative, qualitative, and mixed methods approaches. Students will use these theoretical underpinnings to begin to critically review literature relevant to their field or interests and determine how research findings are useful in forming their understanding of their work, social, local and global environment.

### **Course Objectives:**

The course is to familiarize the students with the foundations of research which are essential in taking up any research activity.

- Understand research terminology
- Be aware of the ethical principles of research, ethical challenges and approval processes
- Describe quantitative, qualitative and mixed methods approaches to research

### **Course content:**

Advanced Algorithms: Complexity Issues, P vs NP, Nondeterministic Problem Reduction, Approximation Algorithms, Data: Types of Data, Clustering, Normalization, Strategies of Clustering, Reduction of Dimension, Graph Slicing, Research: Overview, Hypothesis, Research Categories, Research Process, Documentation, Paper Publications, Thesis Writing, Research Discussions (Seminars, Conferences, Symposiums, Workshops). Theory of science; research problems and strategies in special needs education. Qualitative and quantitative research designs, methods, instruments, data analysis and presentation. Research ethics. Principles and techniques of statistical analysis. Conceptualizing and conducting a research proposal. The course is an obligatory component in the third semester of the two-year Master of Philosophy in Special Needs Education Programme.

### **Course Outcomes:**

Upon completing this course, each student will be able to:

- Demonstrate knowledge of research processes (reading, evaluating, and developing);
- Employ American Psychological Association (APA) formats for citations of print and electronic materials;
- Identify, explain, compare, and prepare the key elements of a research proposal/report;
- Define and develop a possible HIED research interest area using specific research designs;
- Compare and contrast quantitative and qualitative research paradigms, and explain the use of each in HIED research;
- Describe, compare, and contrast descriptive and inferential statistics, and provide examples of their use in HIED research;
- Describe sampling methods, measurement scales and instruments, and appropriate uses of each;
- Explain the rationale for research ethics, and the importance of and local processes for Institutional Review Board (IRB) review;
- Demonstrate how educational research contributes to the objectives of your doctoral program and to your specific career aspirations in HIED.

### **References:**

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran-Computer Algorithms, Silicon Press, 2008.
2. Jean-Paul Tremblay, P. G. Sorenson – An introduction to data structures with applications, McGraw-Hill.
3. Horowitz Ellis Sahni Sartaj & Anderson-Freed Susan Fundamentals of Data Structures In C (Pul), Orient Black Swan.
4. Anil K Jain, R. C. Dubes: Algorithms for Clustering Data.
5. Anil K Jain, M. N. Murthy and P. J. Flynn: Data Clustering-A Review
6. Related Research papers.

## **COURSE-II: LITERATURE REVIEW**

### **Course Outcomes:**

- Identify the components of a literature review process
- Critically analyze published research
- Perform literature reviews using print and online databases;