K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE

Department of Computer Science & Engineering

M.Tech SECOND SEMESTER SYLLABUS

Course: SKILL ENHANCEMENT FOR RESEARCH EXCELLENCE-1		Semester	II
Course Code	**25MSCS258**	CIE Marks	50
Number of contact Hours/Week	2	SEE Marks	50
Credits	01	Exam Hours	03
Examination type (SEE)	**Seminar**		

Course Objectives (Course Skill Set)

The M.Tech Research Skills Development program equips students with essential skills for successful research and publication, including understanding research fundamentals, conducting literature reviews, selecting appropriate methodologies, writing proposals and papers, analyzing data, presenting findings, adhering to ethical standards, and engaging in networking and collaboration, culminating in the effective publication of only 1 research article to Scopus-indexed conferences.

Course objectives:

- **To** produce high-quality research papers that meet the standards of international conferences or peer-reviewed journals.
- **To** effectively identify suitable journals for publication based on the scope and impact of research findings.
- **To** demonstrate proficiency in writing and structuring research papers according to academic conventions.
- **To** engage in the peer review process, providing and receiving constructive feedback to enhance research quality.
- **To** develop skills for presenting research at conferences, including crafting effective abstracts and posters.
- **To** cultivate a strong understanding of ethical considerations in research and publication practices.
- **To** utilize citation management tools to organize references and ensure proper attribution in publications.
- **To** enhance collaboration skills for co-authoring papers and working within research teams.
- **To** stay informed about current trends and advancements in the field to ensure relevance in publications.
- **To** refine the ability to respond to reviewer comments and revise manuscripts effectively.
- **To** understand the importance of open access and alternative publication models in disseminating research.
- **To** build a professional network that supports research collaborations and publication opportunities.

I. Understanding Research Fundamentals

- **Definition of Research:** Understand what constitutes research and its significance in technology and engineering.
- **Types of Research:**

Basic Research: Focused on gaining comprehensive knowledge without immediate applications.

Applied Research: Aimed at solving specific problems.

Literature Review

- **Conducting a Literature Survey:**
  Identify relevant academic papers, journals, and conference proceedings. Summarize key findings and methodologies from existing literature.
- **Critical Analysis:**
  Evaluate the strengths and weaknesses of existing research. Identify gaps in the literature that your research can address.

II. Research Methodology

Selecting a Research Topic:
Choose a topic that aligns with your interests and current trends in technology.

Research Design:
Decide on qualitative, quantitative, or mixed methods based on your research objectives.

Data Collection Techniques:
Surveys, interviews, experiments, and simulations.

III. Writing Research Proposals

Structure of a Proposal:
Introduction, Literature Review, Methodology, Expected Outcomes, and References.

Proposal Presentation:
Practice presenting your proposal to peers and faculty for feedback.

IV. Data Analysis

Statistical Tools:
Familiarize yourself with tools like MATLAB, R, or Python for data analysis.

Interpreting Results
Learn to draw meaningful conclusions from your data and relate them back to your research questions.

V. Writing Research Papers

- **Structure of a Research Paper:**
  Abstract, Introduction, Methodology, Results, Discussion, Conclusion, and References.
- **Academic Writing Skills:**
  Focus on clarity, coherence, and proper citation of sources.
- **Peer Review Process:**
  Understand the importance of peer review and how to respond to reviewers' comments.

VI. Presentation Skills

- **Effective Communication:**
  Develop skills to present your research findings clearly and confidently.
- **Use of Visual Aids:**
  Incorporate slides, charts, and graphs to enhance your presentations.

VII. Ethical Considerations in Research

- **Understanding Ethics:**
  Familiarize yourself with ethical guidelines related to research involving human subjects, data privacy, and plagiarism.
- **Responsible Conduct of Research:**
  Promote integrity and accountability in your research practices.

Submitting Manuscripts to Scopus-Indexed Conferences or Web of Science or Proceedings /Book Chapters

1. **Identify Relevant Conferences**
   - **Research Scopus-Indexed Conferences:**
     Use platforms like Conference Alerts, IEEE Xplore, or the Scopus website to find conferences in your field.
   - **Check Conference Indexing:**
     Ensure that the conference is indexed in Scopus by checking its official website or the Scopus database.
2. **Prepare Your Manuscript**
   - **Follow Conference Guidelines:**
     Each conference has specific formatting and submission guidelines. Adhere to these requirements.
   - **Structure of the Manuscript:**
     Title, Abstract, Introduction, Methodology, Results, Discussion, Conclusion, and References.
   - **Language and Clarity:**
     Use clear and concise language. Consider having your manuscript proofread by peers or professionals.

Submission of manuscript, Registration and Presentation finally Publication.

Course outcomes:

- At the end of the course the student will be able to:
- Produce High-Quality Research Papers: Create research papers that meet international conference and peer-reviewed journal standards.
- Identify Suitable Journals: Effectively select appropriate journals for publication based on research scope and impact.
- Proficiency in Writing: Demonstrate skill in writing and structuring research papers according to academic conventions.
- Engage in Peer Review: Actively participate in the peer review process by providing and receiving constructive feedback.
- Develop Presentation Skills: Acquire skills for presenting research at conferences, including crafting effective abstracts and posters.
- Understand Ethical Considerations: Cultivate a strong understanding of ethical issues in research and publication practices.
- Utilize Citation Management Tools: Use citation management tools to organize references and ensure proper attribution.
- Respond to Reviewer Comments: Refine the ability to address reviewer comments and revise manuscripts effectively.

The assessment for **Skill Enhancement for Research Excellence** will be divided into **Continuous Internal Evaluation (CIE) and Semester End Examination (SEE), each carrying 50 marks.**

Continuous Internal Evaluation (CIE) – 50 Marks

CIE shall be conducted **weekly** and will be assessed based on:

- **Base Papers Referred & Review** – 10 Marks
- **Presentations on Proposed Concepts** – 15 Marks
- **Preparation of Conference Papers (Preferably Scopus Indexed or Reputed Conferences)** – 25 Marks

Semester End Examination (SEE) – 50 Marks

- The **SEE examiner may be appointed from the same college** for evaluation.
- The candidate must **present their research work** before the examiner.
- **Mandatory requirement:** The candidate must have **submitted a paper to a conference** or **accepted or presented** at a reputed conference.
- Marks will be awarded based on:
  - **Research Presentation Quality** – 25 Marks
  - **Clarity of Concept & Methodology** – 15 Marks
  - **Conference Submission & Acceptance/Presentation** – 10 Marks