SILVER OAK UNIVERSITY

Engineering and Technology (M.Tech.)

Computer Engineering (Software Engineering)
Subject Name: Research Methodology
Subject Code:
Semester: I

Objective:

The purpose of this subject is to orient the students to the scientific methodology of research and presenting their thesis. Research constitutes primarily of literature review, giving critical comments on the literature reviewed and identifying the gap, problem formulation, modeling in either an analytical or experimental set up, validating the model and solving the problem you set for yourself. At the end, student should be able to present and defend the solution he/she has found, in a simple and easy manner. Communicating the research outcomes, is an art wherein, you do not want to either undermine or over emphasise the content, within the short time limit given for such presentations. The balance of critical technicality and overall outcomes is the key to an effective presentation. The language, content and articulation should be such as to convey in a unified manner, the gist of your work.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Evaluation Scheme				Total Marks
L	T	P	C	Internal		External		
				Th	Pr	Th	Pr	
2	0	0	2	-	20	-	80	100

Content:

Unit No.	Course Contents	Teaching Hours	Weightage %
I	**Starting Research** **Find what is expected of you:** Identify specific requirements for evaluation/review and what constitutes completion of your work. Find where the source is available Establish proper methods for finding the relevant material from the source. **Analyse the question:** Identify key areas in your field Determine the nature and extension of papers that you should read.	12	40

	Identify the gaps: Learn to Critique existing knowledge and how to find the gap. **Formulate the Problem Statement:** Understand what should be the key aspects of your problem statement. Examples of effective and ineffective Titles. **Validation**: Identify problem and experimental/theoretical data for comparison with your model Learn how to extrapolate/scale data for validation Find what is acceptable level of error and justification thereof		
II	**Finding Good Literature** **Decide which sources you will need** Differentiate between journals, conferences, books, magazines and their quality Understand how to establish their quality and authenticity **Finding Information** How to conduct effective searches How to find relevant papers related to your area of research How to capture critical information **Identify main ideas in scholarly literature** Understand and identify the bias, theoretical position and evidence produced **Write notes to organize your ideas** Compare ideas and concepts from different papers	06	20
III	**Writing and Presenting your Work** **Effective technical writing** How to write Report, Paper, Developing a Research Proposal, Format of research proposal **Build your argument** Recognise the importance of emphasizing your point Distinguish between your point and the evidence available Acknowledge the evidence **Review and finalize your work** Know and follow the Process of reviewing and proof reading your work Use feedback to improve your work **Check the logistics of your presentation** Identify the key message of your presentation	12	40

	Understand the expectations and what will be the key review points **Develop the structure of your presentation** Understand the key components of an oral presentation Know the usual structure of a good presentation **Prepare for delivery of your Oral presentation** Rehearse and time your presentation Prepare to answer questions from the audience: Fundamental concepts should be spoken from memory as reviewer will be looking for evidence of your thorough understanding Read more than the content you are presenting; keep sources ready on hand for reference		

Course Outcome:

At the end of the course the students should be able to:
1. Conduct a quality literature review and find the research gap.
2. Identify an original and relevant problem and identify methods to find its solution
3. Validate the model
4. Present and defend the solution obtained in an effective manner in written or spoken form.
5. Follow research ethics
6. Understand IPR protection for further research and better products

Books Recommended:-

1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students"
2. Ranjit Kumar, 2nd Edition, "Research Methodology: A Step by Step Guide for beginners"
3. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2007.
4. Mayall, "Industrial Design", McGraw Hill, 1992.
5. Niebel, "Product Design", McGraw Hill, 1974.
6. Asimov, "Introduction to Design", Prentice Hall, 1962.
7. Robert P. Merges, Peter S. Menell, Mark A. Lemley, " Intellectual Propertyin New Technological Age", 2016.
8. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008