



Course Title: Independent Study & Research
Course Code: ISR600, 601, 602, 603
Credit Units: 2
Level: PG

L	T	P/ S	SW/F W	TOTAL CREDIT UNITS
0	0	0	0	2

Course Objectives: During the course, the student will learn how to:

- Develop a research proposal
- Carry out a literature search and write a critical state-of-art review
- Select suitable research methods and integrate them within a research methodology
- Carry out the research processes
- Analyze results critically
- Write-up the body of work as a technical report.

Prerequisites: None

Course Contents / Syllabus:

Module I: Problem Statement	25% Weightage
The student will identify a problem area in which they want to work. The scientific motivation of their research and contribution to society should be sound. A literature review is expected that will show the student's background and knowledge of the work done in the field. They must show how their idea or method will be novel or original and improve upon the existing methods. Develop a research proposal Mention the scientific motivation State the contribution of your work Review or survey previously published literature in this area Identify the novelty and originality of your method	
Module II: Experimentation	25% Weightage
The student will develop a research methodology. Eg. They will execute their algorithm, gather data points after deciding the number of samples statistically. Regression analysis and model or curve fitting can be done to estimate relationships among variables or to see how well their theoretical or mathematical model matches the numerical data collected experimentally. Determine your research	

methodology Execute your procedure or algorithm Collect data Decide number of samples or case studies or data points necessary Fit a model to your data	
Module III: Analysis	25% Weightage
The student will demonstrate and illustrate the results graphically with plots and figures. Tables should be used to compare outcomes and tabulate results. The student will compare their method's results with those of previously published state-of-the-art methods. Regression analysis, scatter, and Bland-Altman plots can be used to graphically illustrate and compare results among or between methods. Validation is required against a gold standard that is accepted by experts of the area. Illustrate your results with plots and graphs Tabulate your data Compare your method with previously published methods Use Bland-Altman, scatter plot, regression analysis, curve fitting, etc. to scientifically illustrate results Validate your results against a gold standard or state-of-the-art	
Module IV: Paper or Technical Report	25% Weightage
As an outcome or result of this research work, the student will write a paper or technical report demonstrating good, solid, and sound scientific writing presenting the results. Abstract should be a short summary of the paper containing the paper's contribution, novel methodology applied, data used, numerical results in terms of speed, performance, and accuracy and how the presented method is validated and better than previously published methods. Introduction should contain the motivation of the research, literature review of previously published work in the area, the novel method proposed, the main contribution or advantages of the method proposed compared to previously published methods, and an outline of the rest of the paper. Methodology should contain subsections on data acquisition, mathematics behind the proposed methodology, algorithm(s) used, equations and figures illustrating the algorithm or method. Results section needs to graphically illustrate the model or curve fitting or regression analysis, compare the outcomes of the proposed method with previously published state-of-the-art methods, and validate the results against a gold standard. Conclusion section should discuss the advantages, disadvantages, and limitations of the method presented in the paper. It should summarize the speed and performance comparisons against other methods and the accuracy validated with a gold standard.	

Student Learning Outcomes:

- Investigate in depth a problem of scientific relevance
- Survey recent research in a chosen topic
- Acquaint with research methods applicable to the topic
- Organize and carry out an independent study
- Develop writing and presentation skills for scientific communication

Pedagogy for Course Delivery: NA

ASSESSMENT PLAN AND CONTINUOUS ASSESSMENT:

The institute will define the assessment plan and tools keeping in mind the Program Learning Outcomes (PLOs), Student Learning Outcomes (SLOs) and Course objectives.

The assessment will have clearly defined Continuous Internal Assessment and Final Assessment weightage, which have various components to assess various learning outcomes.

The weightage of CIA and Final Assessment will be as under:

S.N.	Continuous Internal Assessment	Final Assessment	Total
1	30	70	100

INTERNAL ASSESSMENT COMPONENTS

SNo	Name Of Component	Maximum Marks
1	PRESENTATION	10
2	VIVA VOCE	10
3	OBSERVATION OF SUPERVISOR	5
4	PLAGIARISM REPORT	5

EXTERNAL ASSESSMENT COMPONENTS

SNo	Name Of Component	Maximum Marks
1	INTRODUCTION & STATEMENT OF THE PROBLEM	10
2	METHODOLOGY / METHODS / APPROACH	10
3	LITERATURE STUDY	10
4	PROJECT REPORT	10
5	INNOVATION & QUALITY	10
6	PRESENTATION	10
7	VIVA VOCE	10