

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Research Project-II
Course Code:	18-CAM409-4C
Pre-requisite Course:	Completion of Research Project – I with basic knowledge of programming, DBMS, software engineering, testing methods, and research methodology.

Course Objective (CO):

This course is intended to make the students:

- To complete the research-oriented project initiated in Semester VII.
- To implement full system development with advanced modules.
- To evaluate performance and validate research outcomes.
- To prepare a comprehensive dissertation/report.
- To defend the project before external examiners.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
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Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Advanced Implementation: Completion of remaining modules and system integration, Security implementation and optimization techniques, Performance testing and debugging of the developed system, Documentation, deployment, and maintenance of the application.	15	20
2.	Testing and Validation: Unit, Integration and System Testing, Performance evaluation and comparative analysis. Result analysis and validation of objectives, Error detection, debugging and system reliability assessment, User acceptance testing (UAT) and feedback-based improvements.	15	20
3.	Research Analysis and Findings: Data analysis and interpretation, Graphical representation of results, Discussion of findings and limitations, Comparison of results with existing studies or expected outcomes, Recommendations for future work and possible improvements.	15	20
4.	Dissertation and Presentation: Final dissertation preparation as per university guidelines, Research paper drafting (optional), Final project presentation and viva preparation, Preparation of project documentation, references, and bibliography, Submission of final report and demonstration of the developed system.	15	20
5.	Case Study Based (Applied Investigation): Advanced Implementation, Testing and Validation, Research Analysis and Findings, Final project presentation preparation, Problem identification and case study analysis in a real-world scenario, Preparation of case study report with conclusions and recommendations.	15	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO1: Implement and integrate system modules with security and optimization.
- CLO2: Perform unit, integration, and system testing.
- CLO3: Evaluate performance and validate project objectives.
- CLO4: Analyze data and present findings with graphical representation.
- CLO5: Prepare project report and deliver final presentation with viva.

List of Text Book:

1. Kothari, C.R., “Research Methodology: Methods and Techniques”, New Age International Publishers.
2. Kumar, Ranjit, “Research Methodology: A Step-by-Step Guide for Beginners”, SAGE Publications.
3. Pressman, Roger S., “Software Engineering: A Practitioner’s Approach”, McGraw-Hill.
4. Jalote, Pankaj, “An Integrated Approach to Software Engineering”, Springer.
5. IEEE Standards Association, “IEEE Guide for Software Project Documentation”.

List of Reference Book:

1. The Craft of Research – Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams, University of Chicago Press.
2. Case Study Research and Applications – Robert K. Yin, SAGE Publications.
3. Designing Data-Intensive Applications – Martin Kleppmann, O’Reilly Media.
4. Software Testing and Analysis – Mauro Pezzè and Michal Young, Wiley India.
5. The Art of Software Testing – Glenford J. Myers, Corey Sandler, Tom Badgett, Wiley.
6. IEEE Standards Association – IEEE Software Engineering Standards and Documentation Guidelines.

E-Resource / Web Links:

- https://www.tutorialspoint.com/research_methodology/index.htm
- <https://libguides.mit.edu/research>
- <https://sk.sagepub.com/>
- <https://www.guru99.com/software-testing.html>
- <https://www.projectmanager.com/blog/project-documentation>

Practical:

- 1) Problem identification and selection of project topic.
- 2) Literature survey and review of related research work.
- 3) System design, architecture planning, and methodology selection.
- 4) Development and implementation of project modules.
- 5) Integration of modules and system functionality testing.
- 6) Testing and validation (Unit testing, Integration testing, System testing).
- 7) Data analysis and interpretation of obtained results.
- 8) Graphical representation and evaluation of results.
- 9) Preparation of project documentation and dissertation writing.
- 10) Preparation of project presentation and viva voce.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1				H	H		M					L			
CLO2	H			H	H		M			M	M		M	L	M
CLO3				M	H								M		
CLO4	H				H								M		
CLO5				H	H	H	M	M	M		H		M	M	H
CLO6				H	H	H	M	M	M		H		M	M	H

H: High, M: Medium, L: Low