Department of Computer Applications

Programme Structure for M. C.A.

Second Year Semester III: Teaching Scheme

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Th	Pr	Tu	Th	Pr	Tu	Total credits
P72PC301	Mobile Application Development	3	-	-	3	-	-	3
P72PC302	MOOC	3	-	-	3	-	-	3
P72PR301	Dissertation Phase I	-	12	-	-	6	-	6
P72OT301	Industry Internship	-	16	-	-	8	-	8
Total		**6**	**-**	**-**	**06**	**14**	**-**	**20**

Th: Theory, Pr: Practical, Tu: Tutorial

Department of Computer Applications

Programme Structure for M. C.A.

Second Year Semester III: Evaluation Scheme

Course Code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE	Term work	Practical Oral/ POE	
		T1	T2	FET	Total				
P72PC301	Mobile Application Development	10	10	5	25	50	-	-	75
P72PC302	MOOC	-	-	-	-	75	-	-	75
P72PR301	Dissertation Phase I	-	-	-	-	-	100	50	150
P72OT301	Industry Internship	-	-	-	-	-	150	50	200

FET – Faculty evaluation for Theory, T1, T2, Continuous Assessment Test, SEE - Semester End Examination

Department of Computer Applications

Programme Structure for M. C.A.

Second Year Semester IV: Teaching Scheme

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Th	Pr	Tu	Th	Pr	Tu	Total credits
P72PR401	Dissertation Phase II	-	40	-	-	20	-	20
	Total	-	40	-	-	20	-	20

Semester IV: Evaluation Scheme

Course Code	Course Name	*Theory Marks*					*Practical Marks*		Total
		Internal Assessment				SEE	Term work	Practical Oral / POE	
		T1	T2	FET	Total				
P72PR401	Dissertation Phase II	-	-	-	-	-	350	150	500

OR

Department of Computer Applications

Programme Structure for M. C.A. Second Year

III: Teaching Scheme (Research)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Th	Pr	Tu	Th	Pr	Tu	Total credits
P72RP301	Dissertation Phase I – Research	-	40	-	-	20	-	20

Semester III: Evaluation Scheme

Course Code	Course Name	*Theory Marks*					*Practical Marks*		Total
		Internal Assessment				SEE	Term work	Practical Oral/ POE	
		T1	T2	FET	Total				
P72RP301	Dissertation Phase I – Research	-	-	-	-	-	350	150	500

Department of Computer Applications

Programme Structure for M. C.A. Second Year

IV: Teaching Scheme (Research)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Th	Pr	Tu	Th	Pr	Tu	Total credits
P72RP401	Dissertation Phase II – Research	-	40	-	-	20	-	20

Semester IV: Evaluation Scheme

Course Code	Course Name	*Theory Marks*					*Practical Marks*		Total
		Internal Assessment				SEE	Term work	Practical Oral/ POE	
		T1	T2	FET	Total				
P72RP401	Dissertation Phase II – Research	-	-	-	-	-	350	150	500

SEMESTER III

Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
P72PC301	Mobile Application Development	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		
P72PC301	Mobile Application Development	T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
		10	10	5	25	40%	50	40%	75

Course Description:

This course provides a comprehensive insight into developing applications running on smart mobile devices and demonstrates programming skills for managing tasks on mobile. To provide a systematic approach for studying definitions, methods, and applications for mobile application development.

Prerequisite: Java Based Application Development, Database Concepts

Course Objectives:

1	To learn about the Android Operating System, install and configure Android Studio and facilitate students in understanding Android SDK.
2	To help students to gain a basic understanding of Android application development
3	To access and work with databases under Android operating System.
4	To explain and use key Android programming concepts and Build enterprise-level mobile applications with Android.

Course Outcome: At the end of this course students will able to:	
CLO1	**Understand**[2] the requirements of the Mobile programming environment.
CLO2	**Discuss**[2] about basic methods, tools and techniques for developing Mobile Applications
CLO3	**Develop**[5] applications based on Android Platform.
CLO4	**Develop**[5] working prototypes for various uses in daily lives.

Course Contents

Module	Unit	Description	Hours
1.0		**Mobile Application Basics**	9
1	1.1	Introduction to Android: The Android Platform, Android SDK, Android Installation, Building you First Android application, Android Architecture, Android Manifest file.	
	1.2	Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions	
2.0		**Android User Interface**	9
2	2.1	Understanding the Components of a Screen. CheckBox, ToggleButton, RadioButton, and RadioGroup Views, ProgressBar View, AutoCompleteTextView,	
	2.2	TimePicker View, DatePicker View, ListView View, Spinner View, User Input Controls, Menus, Screen Navigation, RecyclerView, Drawables, Themes and Styles	
3.0		**Internet and Android Application**	9
3	3.1	Connecting to the Internet: Broadcast Receiver, Services, Notification, Alarm Manager	
	3.2	Testing Android applications, Publishing Android application, Using Android preferences.	
4.0		**Database Connectivity in Android**	
4	4.1	Data - saving, retrieving, and loading: Overview to storing data, Shared preferences	9

	4.2	SQLite primer, store data using SQLite database	
5.0		**Android APIs**	9
5	5.1	Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers,	
	5.2	Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World	

References:

1. Beginning Android 4 Application Development", Wei-Meng Lee, March 2012, WROX
2. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011
3. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd
4. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd

- **Internal Assessment (T1, T2 and FET):**

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. Fifth module will be assessed for 5 marks separately.

- **Semester End Examination:**

1. Question paper will comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be 2/3/4 hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
P72PR301	Dissertation Phase I	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		-	12	-	-	6	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (POE)		
P72PR301	Dissertation Phase I	Term Work	Min pass %	Marks	Min pass %	Total (Marks)
		100	40	50	40	150

Course Objectives:

1. To develop the ability to conduct independent and innovative research work.
2. To enhance analytical, problem-solving, and critical thinking skills through a practical, real-world project.
3. To provide exposure to project management and technical documentation.
4. To prepare students for effective technical communication and research presentations.

Course Outcomes:

Upon successful completion of Dissertation Phase I, students will be able to:

1. Identify and formulate a major research problem in a chosen domain.
2. Conduct an extensive literature review to understand existing work in the field.
3. Design a suitable methodology to address the identified problem.
4. Prepare a detailed research proposal and project plan.
5. Present their research progress through comprehensive reports and oral presentations.

Syllabus:

Module 1: Problem Identification and Proposal Writing

- Selection of a research area and formulation of a problem statement.
- Defining the objectives, scope, and deliverable s of the project.
- Conducting a detailed literature survey.
- Preparing a research proposal with timelines and milestones.

Module 2: Research Methodology

- Understanding various research methodologies applicable to Computer Applications.
- Data collection techniques and data analysis methods.
- Identifying tools and technologies for project implementation.

- Risk management and ethical considerations in research.

Module 3: Documentation and Interim Reporting

- Preparing interim reports and project diaries.
- Developing technical writing skills for report preparation.
- Guidelines for referencing and avoiding plagiarism.
- Preparing for oral presentations and progress reviews.

Assessment Methods:

1. **Literature Review Report** (20%): Evaluation based on the thoroughness and relevance of the literature review.
2. **Research Proposal** (30%): Assessment of the quality and feasibility of the research proposal.
3. **Oral Presentation** (20%): Evaluation of the clarity, structure, and delivery of the proposal presentation.
4. **Continuous Assessment** (30%): Based on participation, progress reports, and engagement in course activities.

Recommended Reading:

1. Kothari, C. R. (2004). Research methodology: Methods and techniques (2nd ed.). New Age International (P) Ltd. Publishers.
2. Booth, W. C., Colomb, G. G., & Williams, J. M. (2008). *The craft of research* (3rd ed.). The University of Chicago Press.
3. Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage Publications.
4. Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Sage Publications.

Additional Resources:

- Online research databases (IEEE Xplore, ACM Digital Library, ScienceDirect).
- Reference management tools (Zotero, Mendeley).
- Workshops and seminars on research methodology.

Key Guidelines Dissertation Phases:

Project Selection:

- The project should address a real-world problem.
- It must be technically feasible and within the scope of the student's knowledge.

Project Supervisor:

- Each project will be assigned a supervisor from the faculty.
- The supervisor will provide guidance throughout the project lifecycle.

Plagiarism Policy:

- All project reports will be checked for plagiarism.
- A maximum similarity index of **15%** is allowed. Projects exceeding this limit will be rejected.

Mid-Term Review:

- A mid-term review will be conducted to track the progress of the project.
- Students must present their progress to a panel of faculty members.

Final Presentation:

- The final presentation will be evaluated by an external examiner along with internal faculty members.

Dissertation Phase I Report Template

Title Page

- Title of the Project
- Student Name and Roll Number
- Guide Name
- Department of Computer Applications
- Sanjay Ghodawat University
- Date of Submission

Certificate

As per format

Acknowledgment

Write a brief acknowledgment thanking your guide, department, and institution for their support.

Table of Contents

1. Introduction
2. Literature Review
3. Problem Statement
4. Objectives
5. Methodology
6. Timeline
7. References

1. Introduction

Provide an overview of the project, its background, and the motivation behind selecting this topic.

2. Literature Review

Summarize the existing research and technologies related to your project. Highlight the gaps that your project aims to address.

3. Problem Statement

Define the problem your project will solve. Be clear and concise.

4. Objectives

List the key objectives of the project.

- Objective 1
- Objective 2
- Objective 3

5. Methodology

Describe the approach you will take to achieve the project objectives.

- Tools and technologies
- System architecture
- Implementation steps

6. Timeline

Provide a Gantt chart or timeline to show project milestones.

7. References

Follow a citation format such as APA or IEEE.

Presentation Template for Dissertation Phase I

Slide 1: Title Slide

- Project Title
- Student Name and Roll Number
- Guide Name
- Department of Computer Applications
- Sanjay Ghodawat University

Slide 2: Introduction

- Brief project overview
- Motivation for selecting the topic

Slide 3: Literature Review

- Key research papers and technologies studied
- Gaps identified

Slide 4: Problem Statement

- Clearly define the problem
- Importance of solving it

Slide 5: Objectives

- List of project objectives

Slide 6: Methodology

- Tools and technologies used
- Steps involved in project development

Slide 7: System Design

- High-level system architecture
- Flowcharts or diagrams

Slide 8: Timeline

- Gantt chart showing project milestones

Slide 9: Expected Outcomes

- List the expected outcomes of your project

Slide 10: References

- Cite all sources used in the project

Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
P72OT301	Industry Internship	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		-	16	-	-	8	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (POE)		
P72OT301	Industry Internship	Term Work	Min pass %	Marks	Min pass %	Total (Marks)
		150	40	50	40	200

Course Description:

Internship and Documentation

Sanjay Ghodawat University place high focus on the interaction with industries to give them adequate exposure to the practicing aspects of theoretical knowledge they learn in classroom. Moving a step ahead, in order to enhance the students experience with world of work, we are introducing industry internship with project after a through consultation with industry persons, academicians as a part of the major curricular reforms in the choice based credit system (CBCS).

This course aims at giving students hands on experience with the world of work which imbibes in them the skills and competencies required to make them competent graduates for employment as per the expectation of the industry. It is a semester long (16 Weeks) course where the students are expected to work as interns and carry out the individual project assigned to them by the company. The students learning progress is monitored by both industry person concerned and the institutional Faculty assigned.

This course aims at giving students hands on experience to the world of work which imbibes in them the skills and competencies required to make them competent graduates for employment as per the expectation of the industry. It is a semester long course where the students are expected to work as interns and carry out the individual project assigned to them by the company. The students learning progress is monitored by both industry person concerned and the institutional Faculty assigned.

1. CRITERIA FOR SELECTION OF STUDENTS

The students who want to opt for internship and project track are required to fulfill the criteria specified below:

1. Ready to move to the place where industry assignment is allotted.
2. The entire cost of the Internship will be borne by the students (lodging boarding and any other cost). However, any facilities extended by the company like conveyance facility, subsidized canteen facility and stipend the students can avail.
3. They have to go through the selection process of the company if required.
4. Maximum number of students will be decided based on the policy guidelines prepared by the university/Department and also availability of internships at industries from time to time.
5. Once the student is allotted the company (after final selection process) cannot be changed and it is binding on the student to complete the assignment in that company.

2. CRITERIA FOR LISTING OF COMPANIES

1. It should be a medium or large scale industry having the functional departments and facilities to design develop and manufacture the products or offer services and potential to offer challenging projects.

2. Company should provide minimum 2-3 internship assignments along with projects and extend facilities to students the on the job training (OJT) as well as access to data & information and guidance to complete the assigned project.
3. Should be able to keep record of attendance and provide a mentor to monitor the project and help the students to sort out problem/ issues.
4. Students who are eligible as per criteria and get the internship with their own contacts can also be considered subjected to approval of the company by the University for Internship.

3. INDUSTRY INTERNSHIP MONITORING

A team of faculty members from the institute assigned will monitor closely the progress of training and project and helps to sort out any issues concerned. The institute faculty accountability includes proper orientation of student in the company, helping in finalizing project assignments, mentoring the student for overall effectiveness of internship program and a liaison between companies, student and the department.

4. OUTCOMES EXPECTED AT THE END OF INTERNSHIP

After the successful completion of the Internship, the student should be able to

1. Understand the functioning of the company in the terms of inputs, transformation process and the outputs
2. Develop an attitude to adjust with the company culture, work norms, code of conduct.
3. Understand and follow the safety norms, Code of conduct.
4. Demonstrate the ability to observe, analyze and document the details as per the industry practices.
5. Understand the processes, systems and procedures and to relate to the theoretical concepts that is being studied.
6. Improve the leadership abilities, communication.
7. Demonstrate project management and finance and cost management skills Each student is assigned a faculty mentor by the program department who monitors the progress of the internship and helps the student to sort out any issues/ problems faced by the students. The faculty is scheduled to make visits during the internship

5. WORK DIARY

Each student is provided with a diary which contains details regarding internship, do's and don'ts and evaluation scheme. Students is required to write the dairy regularly and get it signed by the industry guide periodically during the visit the faculty assigned to the student should be able to go through the dairy to access the work done and write the remarks/ instruction. At the end of the internship, the duly completed dairy to be submitted to the department.

6. EVALUATION OF INTERNSHIP: (4 CREDITS)

The assessment of the internship will be done jointly by the industry and the faculty assigned to the students. The tentative scheme of assessment will be

1. Punctuality, behavior and following code of conduct (to be assessed by the company personal) 20%
2. Initiative, observation and interest in learning new things (faculty incharge) 20%
3. Familiarization with specific Department/shop/function assigned to student (to be assessed by the company personal) 20% Final evaluation based on presentation of work, internship report (jointly by the company personnel and examiner appointed by institute & faculty guide. 40% The student is required to complete both internship successfully to become eligible for award of the Degree along with the credits for the self-study/online /certification courses.

SEMESTER IV

Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
P72PR401	Dissertation Phase II	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		-	40	-	-	20	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (POE)		
P72PR401	Dissertation Phase II	Term Work	Min pass %	Marks	Min pass %	Total (Marks)
		350	40	150	40	500

Course Objectives:

1. To enable students to implement the research proposal developed during Dissertation Phase I.
2. To provide hands-on experience in project execution, data analysis, and result validation.
3. To develop advanced technical report writing and presentation skills.
4. To prepare students for publishing research work in conferences and journals.
5. To strengthen the students' ability to present their research findings to a wider audience.

Course Outcomes:

Upon successful completion of Dissertation Phase II, students will be able to:

1. Execute the research methodology proposed in Phase I.
2. Collect, analyze, and interpret data effectively.
3. Validate the research outcomes through testing and practical implementation.
4. Write a comprehensive technical dissertation report.
5. Deliver technical presentations and defend their work during viva voce.

Syllabus:

Module 1: Research Execution and Implementation

- Implementing the research plan from Phase I.
- Developing prototypes or solutions based on the chosen methodology.
- Data collection, analysis, and interpretation.
- Addressing challenges and revising the project plan as needed.

Module 2: Result Analysis and Validation

- Critical evaluation of research results.
- Comparison with existing literature and benchmarks.
- Validation of outcomes through simulations, practical applications, or case studies.

- Ensuring reliability and accuracy of results.

Module 3: Final Documentation and Presentation

- Preparing the final dissertation report according to department guidelines.
- Writing research papers for conferences or journals.
- Preparing a technical presentation for viva voce.
- Tips for effective oral defense and handling questions.

Guidelines for Major Project (Dissertation):

1. The project must be an original contribution to the field of Computer Applications.
2. Students should maintain a project diary to document their progress.
3. Regular progress reviews will be conducted by the project guide and departmental committee.
4. The final report must adhere to the department's prescribed format and include all necessary sections such as abstract, introduction, literature review, methodology, results, discussion, conclusion, and references.
5. Students must follow ethical research practices, and any form of plagiarism will be strictly penalized.

Recommended Resources:

1. Research Methodology: Methods and Techniques by C.R. Kothari
2. The Craft of Research by Wayne C. Booth
3. IEEE/ACM Digital Library for accessing research papers
4. LaTeX/Word for technical documentation
5. Tools like MATLAB, R, Python, and domain-specific software as required

Note:

- **Dissertation Phase I (P72PR301)** focuses on planning, literature review, and proposal development.
- **Dissertation Phase II (P72PR401)** focuses on project execution, result analysis, documentation, and presentation.

Submission Requirements:

1. Interim reports and presentations for Phase I.
2. Final dissertation report, project code (if applicable), and viva voce for Phase II.
3. Students must submit their project diaries and related documentation as part of the term work.

Dissertation Phase II Report Template

Additional Sections to Add:

1. System Design
2. Prototype Development
3. Testing and Validation
4. Results and Discussion
5. Conclusion and Future Work
6. Appendices (if any)

1. **System Design**

Describe the system architecture, including flowcharts, ER diagrams, and UML diagrams.

2. Prototype Development

Provide details on the development of the prototype, including screenshots and descriptions.

3. Testing and Validation

List the test cases, scenarios, and results. Include both functional and non-functional testing.

4. Results and Discussion

Discuss the outcomes of your project. Highlight the key findings and any challenges faced during the project.

5. Conclusion and Future Work

Summarize your project and suggest areas for future improvement.

6. Appendices

Include additional materials like code snippets, user manuals, or other relevant documents.

Presentation Template for Dissertation Phase II

Slide 1: Title Slide

- Project Title
- Student Name and Roll Number
- Guide Name
- Department of Computer Applications
- Sanjay Ghodawat University

Slide 2: Introduction

- Brief project overview

Slide 3: System Design

- Detailed architecture diagrams

Slide 4: Prototype Development

- Screenshots and functionality demonstration

Slide 5: Testing and Validation

- Test cases and results

Slide 6: Results and Discussion

- Key findings and challenges faced

Slide 7: Conclusion and Future Work

- Summary and future improvements

Slide 8: References

- Cite all sources used in the project

SEMESTER III
(Research Track)

Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
P72RP301	Dissertation Phase I (Research)	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		-	40	-	-	20	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (POE)		
P72RP301	Dissertation Phase I (Research)	Term Work	Min pass %	Marks	Min pass %	Total (Marks)
		350	40	150	40	500

Course Description: This course offers an Implementation of research methodology including basic concepts employed in quantitative and qualitative research methods.

Course Objectives:

1. To design and prepare Research Paper which explain the technique of defining a research problem
2. To explain the functions of the literature review in research.
3. To explain carrying out a literature search, its review, developing theoretical and conceptual frameworks, and writing a review.
4. To explain various research designs and their characteristics.
5. To explain the details of sampling designs, and also different methods of data collections.
6. To explain the art of interpretation and the art of writing research reports.

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Identify a suitable research approach for the intended research topic
CO2	Define the research problems, purpose, and objectives of the research
CO3	Conduct a systematic literature review on the research topic.
CO4	Demonstrate scientific methods and processes of conducting quantitative and qualitative research.
CO5	Apply appropriate research methodology for a research topic.
CO6	Develop a research Paper best suitable for the selected research topic.

Evaluation Pedagogy 5 components

1.Component Certificate Course (Research methodology) Registered on NPTEL	2.Component Finalization Topic for Research Paper	3.Component Review of Literature Minimum 50 Papers	4.Component Finding/conclusion	5.Component Paper Publication
100	50	150	100	100

Each student will have to submit relevant document for each of the above components to his/her supervisor/guide through physical presence and evaluation of the same will be done by the concern supervisor/guide. External evaluation will be based on Published paper and viva voce.

Research Design

Abstract

An abstract summarizes, usually in one paragraph of 300 words or less, the major aspects of the entire paper in a prescribed sequence that includes: 1) the overall purpose of the study and the research problem(s) you investigated; 2) the basic design of the study; 3) major findings or trends found as a result of your analysis; and, 4) a brief summary of your interpretations and conclusions.

Introduction

The research paper introduction conveys a lot of information and can be considered an essential roadmap for the rest of your paper. A good introduction for a research paper is important for the following reasons: A good research paper introduction section should comprise three main elements:
What is known: This sets the stage for your research. It informs the readers of what is known on the subject.
What is lacking: This is aimed at justifying the reason for carrying out your research. This could involve
Investigating a new concept or method or building upon previous research.
What you aim to do: This part briefly states the objectives of your research and its major contributions. Your detailed hypothesis will also form a part of this section.

Review of Literature

Literature reviews can be written using a variety of different styles. These may differ in the way prior research is reviewed as well as the way in which the literature review is organized. Examples of stylistic variations in literature reviews include:

Summarization of prior work Vs. critical evaluation.

In some cases, prior research is simply described and summarized; in other cases, the writer compares, contrasts, and may even critique prior research (for example, discusses their strengths and weaknesses). Chronological vs. categorical and other types of organization. In some cases, the literature review begins with the oldest research and advances until it concludes with the latest research. In other cases, research is discussed by category (such as in groupings of closely related studies) without regard for chronological order. In yet other cases, research is discussed in terms of opposing views (such as when different research studies or researchers disagree with one another). Overall, all literature reviews, whether they are written as a part of a larger work or as separate articles unto themselves, have a common feature: they do not present new research; rather, they provide an overview of prior research on a specific topic.

Methodology

research methodology refers to the collection of practical decisions regarding what data you'll collect, from who, how you'll collect it and how you'll analyze it. Research design, on the other hand, is more about the overall strategy you'll adopt in your study. For example, whether you'll use an experimental design in which you manipulate one variable while controlling others.
Findings/Results Findings of a research paper are crucial as they present the data collected during the study in a clear, concise and systematic manner without interpretation. This section provides the empirical evidence needed to support the study's conclusions. Primarily, the findings section aims to display the data systematically and logically, allowing readers to understand the basis of the study's conclusions. Additionally, it shows how the results align with the research questions or hypotheses, indicating whether they were supported or refuted by the data. It ensures transparency and reproducibility by providing enough detail for other researchers to replicate the study if needed, thereby verifying the results.

Discussion

In the results section of your academic paper, you present what you found when you conducted your

analyses, whereas in your discussion section you explain what your results mean and connect them to prior research studies. In other words, the results section is where you describe what you did, and the discussion sections is where you describe what this means for the field.

Conclusion

Having zoomed back in on the problem, it's time to summarize how the body of the paper went about addressing it, and what conclusions this approach led to.Depending on the nature of your research paper, this might mean restating your thesis and arguments, or summarizing your overall findings.

TEXTBOOKS

1. Research methodology by R. Pannerselvam 2013 2. Research methodology models and techniques IInd edition by C.R. Kothari 2006 3.
2. Fundamentals of research methodology and statistics by Yogesh Kumar Singh 2009

REFERENCES

1. Research design Qualitative, Quantitative, and mixed methods approaches IInd edition by JOHN W. CRESWELL 2017.
2. Ajit Parulekar and Sarita d' Souza, Indian Patents Law – Legal & Business Implications; Macmillan India ltd, 2008

SEMESTER IV
(Research Track)

Theory Course

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
P72RP401	Dissertation Phase II (Research)	-	40	-	-	20	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (POE)		
		Term Work	Min pass %	Marks	Min pass %	Total (Marks)
P72RP401	Dissertation Phase II (Research)	350	40	150	40	500

Course Description: This course offers an Implementation of research methodology including basic concepts employed in quantitative and qualitative research methods.

Course Objectives:

7. To design and prepare Research Paper which explain the technique of defining a research problem
8. To explain the functions of the literature review in research.
9. To explain carrying out a literature search, its review, developing theoretical and conceptual frameworks, and writing a review.
10. To explain various research designs and their characteristics.
11. To explain the details of sampling designs, and also different methods of data collections.
12. To explain the art of interpretation and the art of writing research reports.

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Identify a suitable research approach for the intended research topic
CO2	Define the research problems, purpose, and objectives of the research
CO3	Conduct a systematic literature review on the research topic.
CO4	Demonstrate scientific methods and processes of conducting quantitative and qualitative research.
CO5	Apply appropriate research methodology for a research topic.
CO6	Develop a research Paper best suitable for the selected research topic.

Evaluation Pedagogy 5 components

1.component Certificate Course (Research methodology) Registered on NPTEL	2.component Finalization Topic for Research Paper	3.component Review of Literature Minimum 50 Papers	4.component Finding/conclusion	5.component Paper Publication
100	50	150	100	100

Each student will have to submit relevant document for each of the above components to his/her supervisor/guide through physical presence and evaluation of the same will be done by the concern supervisor/guide. External evaluation will be based on Published paper and viva voce.

Research Report Format

Abstract

An abstract summarizes, usually in one paragraph of 300 words or less, the major aspects of the entire paper in a prescribed sequence that includes: 1) the overall purpose of the study and the research problem(s) you investigated; 2) the basic design of the study; 3) major findings or trends found as a result of your analysis; and, 4) a brief summary of your interpretations and conclusions.

Introduction

The research paper introduction conveys a lot of information and can be considered an essential roadmap for the rest of your paper. A good introduction for a research paper is important for the following reasons: A good research paper introduction section should comprise three main elements:
What is known: This sets the stage for your research. It informs the readers of what is known on the subject.
What is lacking: This is aimed at justifying the reason for carrying out your research. This could involve investigating a new concept or method or building upon previous research.
What you aim to do: This part briefly states the objectives of your research and its major contributions. Your detailed hypothesis will also form a part of this section.

Review of Literature

Literature reviews can be written using a variety of different styles. These may differ in the way prior research is reviewed as well as the way in which the literature review is organized. Examples of stylistic variations in literature reviews include:

Summarization of prior work Vs. critical evaluation.

In some cases, prior research is simply described and summarized; in other cases, the writer compares, contrasts, and may even critique prior research (for example, discusses their strengths and weaknesses). Chronological vs. categorical and other types of organization. In some cases, the literature review begins with the oldest research and advances until it concludes with the latest research. In other cases, research is discussed by category (such as in groupings of closely related studies) without regard for chronological order. In yet other cases, research is discussed in terms of opposing views (such as when different research studies or researchers disagree with one another). Overall, all literature reviews, whether they are written as a part of a larger work or as separate articles unto themselves, have a common feature: they do not present new research; rather, they provide an overview of prior research on a specific topic.

Methodology

research methodology refers to the collection of practical decisions regarding what data you'll collect, from who, how you'll collect it and how you'll analyse it. Research design, on the other hand, is more about the overall strategy you'll adopt in your study. For example, whether you'll use an experimental design in which you manipulate one variable while controlling others.
Findings/Results Findings of a research paper are crucial as they present the data collected during the study in a clear, concise and systematic manner without interpretation. This section provides the empirical evidence needed to support the study's conclusions. Primarily, the findings section aims to display the data systematically and logically, allowing readers to understand the basis of the study's conclusions. Additionally, it shows how the results align with the research questions or hypotheses, indicating whether they were supported or refuted by the data. It ensures transparency and reproducibility by providing enough detail for other researchers to replicate the study if needed, thereby verifying the results.

Discussion

In the results section of your academic paper, you present what you found when you conducted your analyses, whereas in your discussion section you explain what your results mean and connect them to prior research studies. In other words, the results section is where you describe what you did, and the discussion sections is where you describe what this means for the field.

Conclusion

Having zoomed back in on the problem, it's time to summarize how the body of the paper went about addressing it, and what conclusions this approach led to.Depending on the nature of your research paper, this might mean restating your thesis and arguments, or summarizing your overall findings.

TEXTBOOKS

1. Research methodology by R. Pannerselvam 2013 2. Research methodology models and techniques IInd edition by C.R. Kothari 2006 3.
2. Fundamentals of research methodology and statistics by Yogesh Kumar Singh 2009

REFERENCES

1. Research design Qualitative, Quantitative, and mixed methods approaches IInd edition by JOHN W. CRESWELL 2017.
2. Ajit Parulekar and Sarita d' Souza, Indian Patents Law – Legal & Business Implications; Macmillan India ltd, 2008