



Course Name: PROJECT & THESIS (PHASE-I)

Course Code: MEM-381

(Semester III) Category: Major

Course Broad Category: Project work



1. Course Prerequisite:

- Completion of coursework: Students must have completed all the required coursework for the M.Tech program, including core and elective courses.
- Minimum CGPA: Students must have a minimum cumulative grade point average (CGPA) of 6.0 or higher to be eligible for the project and thesis.
- Research methodology course: Students must have completed a research methodology course, which covers topics such as research design, data collection, and data analysis.
- Specialization courses: Students must have completed specialization courses in their area of interest, which provides them with advanced knowledge and skills in that area.
- Literature review: Students must have completed a literature review in their area of interest, which demonstrates their understanding of the current state of knowledge in that area.
- Research proposal: Students must have developed a research proposal, which outlines the research question, objectives, methodology, and expected outcomes of the project.
- Approval from supervisor: Students must have obtained approval from their supervisor or advisor for the project and thesis topic.
- Ethics clearance: Students must have obtained ethics clearance from the institutional ethics committee, if the project involves human subjects or animals.
- Technical skills: Students must have acquired the necessary technical skills and knowledge to complete the project, such as programming languages, software, or equipment.
- Time management and planning: Students must have demonstrated the ability to manage their time and plan their work effectively to complete the project within the given timeframe.

2. Course Learning Objectives:

The M.Tech project and thesis is a compulsory component of the M.Tech program. It is a research-based project that requires students to apply the knowledge and skills they have acquired during their coursework to a real-world problem or research question. The project and thesis are designed to help students develop their research skills, critical thinking, and problem-solving abilities.

- To apply the knowledge and skills acquired during the coursework to a real-world problem or research question
- To develop research skills, including literature review, research design, data collection, data analysis, and interpretation
- To develop critical thinking and problem-solving abilities
- To produce a high-quality thesis that demonstrates the student's ability to conduct independent research
- To develop communication skills, including written and oral presentation

3. Teaching methodology and evaluation system for the course:

- Regular Meetings: Regular meetings between the student and supervisor to discuss progress, provide feedback, and set goals.
- Progress Reports: The student submits regular progress reports, outlining their progress, challenges, and plans for the next stage of the project.
- Peer Review: The student's work is reviewed by peers, providing feedback and suggestions for improvement.
- Workshops and Seminars: The student participates in workshops and seminars, learning about research methods, academic writing, and presentation skills.
- Online Resources: The student has access to online resources, such as research articles, tutorials, and videos, to support their learning.

- Guest Lectures: Guest lectures from industry experts or researchers, providing insights into real-world applications and current research trends.
- Research Conferences: The student attends research conferences, presenting their research and learning from others in the field.
- Academic Writing Support: The student receives support and guidance on academic writing, including structure, style, and grammar.
- Time Management: The student receives guidance on time management, including setting goals, prioritizing tasks, and managing deadlines.
- Feedback and Evaluation: The student receives regular feedback and evaluation, including constructive criticism and suggestions for improvement.

Total Marks: 100

Passing criteria: 50% and above

- Literature review (20%)
- Research proposal (20%)
- Data collection and data analysis (30%)
- Results and discussion (20%)
- Conclusion and recommendations (10%)
- Thesis writing (50%)
- Thesis defense (20%)

4. Course Content: Course Name: Project & Thesis (Phase-I)

Course Code: MEM-381

Hours per Week: 0L:0T:12P

Credits: 20

Description	Tentative Timeline (overlapped)
1. Literature Review - Conduct a comprehensive literature review on the research topic - Identify the research gap and formulate a research question - Develop a research proposal	4 weeks
2. Research Design - Develop a research design, including data collection and data analysis methods - Identify the sampling strategy and sample size - Develop a data collection plan	4 weeks
3. Data Collection - Collect data using the methods identified in the research design - Ensure that the data is accurate, reliable, and valid	8 weeks
4. Data Analysis - Analyze the data using the methods identified in the research design - Identify the trends, patterns, and relationships in the data	8 weeks
5. Results and Discussion - Present the results of the data analysis - Discuss the implications of the findings - Identify the limitations of the study	4 weeks

6. Conclusion and Recommendations - Summarize the main findings of the study - Provide recommendations for future research - Identify the contributions of the study to the field	2 weeks
7. Thesis Writing - Write a high-quality thesis that demonstrates the student's ability to conduct independent research - Ensure that the thesis is well-organized, well-written, and free of errors	12 weeks)
8. Thesis Defense - Defend the thesis in front of a panel of examiners - Answer questions and provide clarification on the research	2 weeks

5. Course Outcomes

Course Outcomes	Details/Statement	Action Verb	Knowledge Level
CO1	Apply knowledge of research methodology to identify a research problem and develop a research proposal	Apply	Apply
CO2	Conduct independent research and collect data	Conduct	Analyze
CO3	Communicate research findings effectively through a thesis	Communicate	Understand
CO4	Apply critical thinking and problem-solving skills to analyze complex data	Apply	Analyze
CO5	Demonstrate expertise in a specialized area of research	Demonstrate	Evaluate
CO6	Integrate knowledge and skills to produce a high-quality thesis that contributes to the body of knowledge	Integrate	Create

Course Name: SEMINAR & VIVA-VOCE

Course Code: MEM-382

(Semester III) Category: Major

Course Broad Category: M. Tech in Mechanical Engineering

1. Course Prerequisite:

Communication skill, Preparation of presentation

2. Course Learning Objectives:

- To develop students' research and presentation skills
- To help students learn how to defend their research in a viva-voce examination
- To provide students with the opportunity to receive feedback on their research from peers and faculty members
- To help students develop their critical thinking and problem-solving skills

3. Teaching methodology and evaluation system for the course:

- Seminar presentation (30%)
- Viva-voce examination (40%)
- Literature review report (10%)
- Seminar presentation outline (5%)
- Viva-voce preparation report (5%)
- Class participation and attendance (10%)

4. Course Content: Course Name: Seminar & Viva-voce

Course Code: MEM-382

Hours per Week: 4L: 0T: 0P

Credits: 5

Description	Tentative Timeline
1. Introduction to Seminar and Viva-voce - Overview of the course - Importance of seminar and viva-voce in research - Expectations and requirements of the course	1 week
2. Research Topic Selection - Students will select a research topic and submit a proposal - Faculty members will provide feedback on the proposal	1 week
3. Literature Review - Students will conduct a literature review on their research topic - Students will submit a literature review report	2 weeks
4. Seminar Preparation - Students will prepare a seminar presentation on their research topic - Students will submit a seminar presentation outline	4 weeks
5. Seminar Presentation - Students will present their seminar to the class	2 weeks

- Faculty members and peers will provide feedback on the presentation	
6. Viva-voce Preparation - Students will prepare for the viva-voce examination - Students will submit a viva-voce preparation report	4 weeks
7. Viva-voce Examination - Students will defend their research in a viva-voce examination - Faculty members will evaluate the student's performance	1 week

5. Course Outcomes

Course Outcomes	Details/Statement	Action Verb	Knowledge Level
CO1	Develop research and presentation skills	Develop	Apply
CO2	Defend research in a viva-voce examination	Defend	Understand
CO3	Conduct a literature review	Conduct	Understand
CO4	Develop critical thinking and problem-solving skills	Develop	Analyze
CO5	Communicate research findings effectively	Communicate	Understand
CO6	Demonstrate academic integrity and professionalism	Demonstrate	Understand