GUIDELINES

For

Major Project Work

In

M.Tech. (Embedded Systems)
M.Tech. (Spatial Information Technology)
M.Tech. (Mobile Computing Technology)

SCHOOL OF ELECTRONICS
(UNIVERSITY TEACHING DEPARTMENT)

FACULTY OF ENGINEERING SCIENCES
DEVI AHILYA UNIVERSITY
Indore (M.P)

Guidelines

SCHOOL OF ELECTRONICS

M.Tech. Major Project Work

1. Introduction

The courses (EL63501 and EL64501) constitute two semester Project work and is regarded as the capstone course of the entire M Tech Programmes. M Tech project work is a **student-driven project** and does not involve regular classroom delivery and assessment (lectures, tutorials, final examinations etc). They are year-long courses that count for 24 credits (12 Credits each semester).

Industry requires engineers who can design and innovate, as well as display exemplary professional conduct in many contexts. It is no longer sufficient to be competent in analyzing problems; engineers are called on to propose, design and implement solutions to problems and respond to opportunities created by the marketplace. This course responds to the needs of industry in two broad ways – by providing students with a forum for **engineering practice** and by cultivating the **values and ethics necessary for professional conduct** at the workplace.

M Tech Project is designed to develop technical skills in the following areas:

- Design to specification
- Formulation of creative solutions to engineering problems
- Engineering analysis and enquiry
- Validation and testing against benchmarks
- Project management: concept development, planning, implementation and testing
- Time management: planning for unforeseen events and setting realistic goals
- Communication: writing technical reports and delivering professional presentations

It is expected that, in the completion of M Tech Project, students will use the wide range of knowledge and engineering skills that they have gathered over the course of their post graduate programme. However, it is not unusual for a project to require students to rely on a body of knowledge outside of that taught in the programme or, as has been the case on occasion, completely outside of Electronics and Computer Engineering. M Tech Project therefore, presents the opportunity to build upon a core of learning, gained in the earlier years, and to broaden the scope of that knowledge. Students are required to take **complete ownership of their project** and this necessitates a **considerable shift in attitude** as the project demands that, beyond the exercise of

knowledge and skills, they must be **self-regulating** and **self-directed** in their time management and research, respectively.

2. Project Categories

Projects are classified into two (2) broad categories as summarized in Table 1. The project category **determines how the project will be evaluated**. It is essential that students should ascertain the category of their project before they begin.

Type Category Description

Table 1: Project Category

Type	Category	Description
I	Research[a]	Theoretical analysis leading to new knowledge. Requires extensive background preparation and comprehension of subject matter, clear thinking and sound logic.
II	System Development and Design[b]	System design and implementation requiring little knowledge outside of that obtained in the programme. This category focuses strongly on the application of engineering expertise and knowledge gained.

* a - Presentation of research paper in a Conference and / or a journal is desirable.
b – Snapsjhots / picture of a working prototype or simulation results should support the design. Demonstration is mandatory for students doing project in the department.

The one year project can be taken up either in the department, in other educational institute of high repute or in leading Industries.

3. General Instructions

M.Tech project is devided into Phase – I and Phase –II viz.

Phase – I : July-Dec, 20XX

Phase – II : Jan-June, 20XX

1. In project Phase - I students have to necessarily submit project proposal in the format described in Section 4. **ONLY** upon the approval of the project by the department, student can pursue the project activities.
2. Students are required to send the monthly progress report in the format described in section 5 at every 10th Day of the Month (Starting from the month September)
3. Students may be called for Oral Presentation in the middle of Phase – I and Phase – II
4. At the end of Phase – I and Phase – II, students are required to appear for the project viva-voce at a date notified by the department.
5. Students are required to prepare a project report. Format is described in the Appendix III

a. Phase – I : soft bound report (one copy) and softcopy in CD. The report must contain monthly progress reports as appendix. The total pages should not exceed 80.
b. Phase – II : Hard bound report (two copy) and softcopy in CD. The report must contain monthly progress reports as appendix. Thesis for Phase –II should contain all the important activites, simulation, results etc carried out through out the year.

6. Students must submit
   a. Completion certificate signed by supervisor
   b. No stipend certificate (if student gets stipend from department)
   c. Copies of fee deposit bank challan, alumni fee receipt and original fee receipt / challan of first semeter.

4. Project Proposals

All project proposals (Synopsis) must be approved by the Department before they can be accepted. **Project proposals duly signed by supervisor must be submitted by 31 August**. The proposal must clearly specify:

1. Project Details : Please refer Appendix – I (for cover page only)
2. Background *(what is the justification for the project?)*
3. The Scope of the project and Literature survey: the significance of the problem and solutions proposed or implemented by others
4. Project Objectives (what does the project seek to achieve or deliver?)
   (Students are supposed to divide the whole project work in terms of different modules and also require the time for completing a particular module).
5. Project Implementation and Methodology *(the range of activities to complete the project)*
6. Details on how the problem is being addressed
7. Summary of Requirements:
8. Prerequisite skills and knowledge
9. General hardware requirements
10. General software requirements

If for any just reason any part of an approved proposal is to be modified, the revised proposal must receive the approval of the project supervisor and be submitted to the department for approval.

5. Progress Report (September Onwards)

In each semester, the progress reports are mandatory. You will be evaluated on your **understanding of the problem**, the **general requirements of the problem solution**, the **project management procedures** used and **preliminary results** obtained. Progress reports are to be sent on monthly basis by email to Head / Course coordinators. There shall be a midterm appraisal of the project every semester in which you may be called for

a mid term oral presentation at a date notified to you by department. Feedback report on your achievement shall be sent back to you by email and grades obtained in the midterm appraisal shall be counted towards your final grading. Department shall contact your supervisor periodically to know about progress of the work.

The monthly progress report should include:

1. **The project title (title layout as per appendix 1**(for cover page only)**)**
2. **Project category**
3. **Duration of the report**
4. **Problem statement for the duration**
5. **Plans for the completion of the solution**
6. **Preliminary results/Snap shots of the result**
7. **Details of problems encountered**
8. **Books/ Journals/ Webpages referenced**

6. Ethics

M Tech must not be regarded merely as a means toward the award of a degree. Rather, it must be thought of as **an opportunity for professional and personal development and achievement.** You are to spare no effort in **ensuring the integrity of your work.**

You are bound by the following research obligations:

a. You must provide both **in-text and bibliographic citation.** Failure to do so will be taken as an attempt to plagiarize. Plagiarism is a grave offence under the regulations of the University and can attract severe penalties.

b. **Authentic research data are to be presented**. Manipulation of results is regarded as a serious offence, whether it involves falsifying results or distorting them to fit expectations.

7. Final Written Report

Guidelines on the writing of the reports for Phase – I and Phase- II are provided in the Writing Manual (Appendix II).

In every semester, you have to face viva-voce for evaluation of 12 credits. In addition, **copy of the monthly progress reports is to be included** as an appendix in the final report. You are to submit

a. **Phase – I :** The project report (1 copy) must be soft bound. A copy of it must be submitted on CD-ROM. The cover page should be printed in black letters and the text for printing should be identical. Monthly progress report must be attached as Appendix.

b. **Phase – II :** The project report (2 copies) must be hard bound. A copy of it must be submitted on CD-ROM. The cover page should be printed in black letters and the text for printing should be identical. Monthly progress report must be attached as Appendix.

If you have bulky appendices and or programming code place these on a CD-ROM. Ensure that the items are accurately referred to within your body of work. The CD-ROM must be placed in a pocket at the back cover of the report. The CD cover should be superscribed with **Student identification number, file extension, e.g. 2015MTES01.doc. Every student submission made to the Department is subject to examination by an electronic plagiarism checker**. Student shall be required to sign a form indicating that your report does not involve any plagiarism or collusion and this form shall be attached in the report. Projects will not be considered complete without these forms. Students are not allowed to present any changes, addenda or new versions of their final reports after the deadline.

Students failing to comply with the deadline will be allocated zero marks for the entire project

8. Final Oral Presentation

Students are required to present a dissertation of your project as per schedule declared by department. These presentations are open to the public.

The duration of the examination is forty (40) minutes; student shall present in the first fifteen (15) minutes using presentation aids like multimedia (laptop and projector) equipment. Student shall be orally examined on various aspects of his / her project. This dissertation will be presented to a team comprised of External Examiner, Internal Examiner and Head of Department (moderator).

9. Evaluation

The project is evaluated across seven categories: conduct, understanding and comprehension, approach and methodology, results, report(s) and presentation. Each of these is assessed using one of eight letter grades from Fail (F) to Perfect (A+). From this ranking, final marks are calculated using weights determined by the project category.

Table 2: Project Evaluation Level

Grade	**A+**	**A**	**B+**	**B**	**C+**	**C**	**D**	**F**
Level	1	.87	.75	.65	.57	.45	.3	0
Descriptor	Perfect	Excellent	Very Good	Good	Satisfactory	Pass	Poor	No Effort

Table 3: Quality Descriptors

Perfect	There is absolutely no room for improvement
Excellent	The work is deficient only in one or two relatively insignificant components and is overall of a much higher standard than that expected of a good student
Very Good	The work is deficient only in one or two relatively insignificant components but is of a much higher overall standard than that expected of an average student
Good	The work is deficient only in one or two significant components but is overall of a higher standard than that expected of an average student
Satisfactory	The work could have been done better but is of an average standard. The engineering input is generally correct but the treatment lacks depth
Pass	The work is below average but still acceptable. There may be some analytical and design flaws but the work is retrievable
Poor	The student needed to have put more effort into key aspect of the work. Its standard is too low to deserve a passing grade. In particular, there is very little evidence of engineering knowledge being applied here.
No effort	Student made absolutely no attempt at the aspect of work

Table 4: Project Category Weightings

	Conduct	Understanding	Approach	Results	Report(s)	Presentation
I. Research	10	30	20	15	15	10
II. Development/ Design	10	15	25	30	10	10

Table 5: Project Assessment Categories

Conduct	Regular attendance and Punctuality. Rigour and diligence at research material
Understanding and Comprehension	The background theory, its application and limitations
Approach and Methodology	Use of methods and approaches expected of a professional engineer, justification for selecting the methods used and evaluation of alternatives
Results	Provision of the deliverables-conclusions drawn, completeness of design and fabrication, quality of design, demonstration of results
Report(s)	Quality of reports, consistency, grammar and spelling, organization of sections, captioning of figures, tables and graphs
Presentation	Coverage of work done, effectiveness, answers to questions, use of presentation technology

10. Advice for the M Tech Students

The tips provided below are based on problems students have encountered in the past. It is hoped that by sharing these, students can avoid the pitfalls encountered by others. The most important thing to keep in mind regarding M Tech project is that it should be fun! You have to want to do it, enjoy doing it, and be proud you did it. Should this cease to be the case; you should seek help to get back on track. There is nothing worse than pursuing a project which is going nowhere; you will come to hate it, do a poor job, and feel badly about yourself.

1. Pin down your project definition within the first month of receiving the project. Use this time to determine the resources required to arrive at a satisfactory conclusion to your activities. This includes both human (**your time and required effort**) and material resources (**accessibility and availability of parts and components**).

2. A **comprehensive survey of relevant, scholarly literature** is essential to clarifying your project ideas. Reviewing literature also helps to identify what was done previously and so directs the new and original paths that you can take. During your intense and wide reading make sure to keep detailed notes, including bibliographic references, to which you can easily refer as the need arises.

3. Typically, students defer the bulk of their project till the second semester; this approach is characteristic of poor project management and is not at all advised. Instead, students should try to **work at a steady pace throughout the entire year**.

4. Your job will be made easier if the **project can be decomposed into a sequence of significant steps or milestones**. Your supervisor should verify these milestones as soon as they are achieved. With this approach you will have some definite results, if you are unfortunate enough to run out of time.

5. Also, note that *the department reserves the right to withheld/ deduct your scholarship if the performance is not found to be satisfactory.*