

*Heaven's Light is Our Guide*



Department of Electrical & Electronic Engineering  
Rajshahi University of Engineering & Technology

**EEE 4000**

**PROJECT & THESIS**

**MANUAL**

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## 1. Guidelines for final year design project

These guidelines may serve as a framework for undergraduate project & thesis. These guidelines cover the procedures, goals, and responsibilities of students and supervisor involved in undergraduate project & thesis.

## 2. Objectives

The objective of this manual is to provide a clear idea about the strategy for developing a project or thesis. It also guides students and supervisors about the undergraduate final year design project.

## 3. Structure of final year design project

The flow diagram of undergraduate project & thesis is shown in Fig.1.

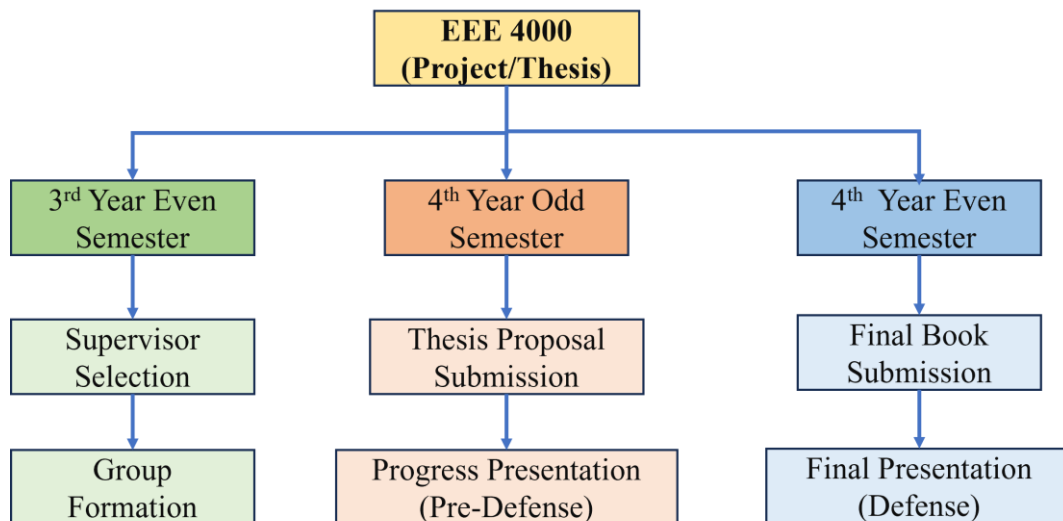


Fig.1: Flow diagram of undergraduate project & thesis

This course will be completed by maintaining the following steps:

1. *Selecting a project & thesis supervisor* for final year project & thesis according to the **“Project & Thesis Distribution Guideline”** provided by the department at the starting of 3<sup>rd</sup> year even semester.
2. *Starting* the thesis/project work individually or by forming a group of maximum two under the guidance of supervisor.
3. *Implementing the project/thesis* in 4<sup>th</sup> year by the following steps:
  - a. *Selecting the project/thesis title* after identifying the problem through literature survey under the guidance of the supervisor.
  - b. *Submitting a project proposal* to the department office through the project/ thesis supervisor within the 3<sup>rd</sup> week of 4<sup>th</sup> year odd semester.
  - c. *Presenting* the progress of thesis/project at pre-defense after mid-break of 4<sup>th</sup> year odd semester.
  - d. *Submitting the draft project/thesis report* to the project supervisor for similarity index checking two weeks prior to final defense date.
  - e. *Defending the project/thesis* by presenting their final work in-front of selected board members at the end of 4<sup>th</sup> year even semester examination.
  - f. *Submitting total 4 copies of final project/thesis report* (one for supervisor, one for Central library, and two for rental library) through the supervisor for final clearance.

## 4. Project & Thesis Supervisor

Students will approach to the faculty members of EEE department based on their research interest at the end of 3<sup>rd</sup> year odd semester and it will be finalized in the beginning of 3<sup>rd</sup> year even semester. Students may also discuss with their respective course advisor to find their project/thesis supervisor according their field of interest. Supervisor will choose the interested students as per the “**Project & Thesis (EEE 4000) Distribution Guideline**” which is attached in the **Annex I**. After selecting the supervisor, students will follow the given steps:

- The plan for completing the research project/thesis as described in the *course curriculum* should envision approximately 2, and 4 hours per week (including work in the laboratory, field, library, etc.) in the 4<sup>th</sup> year odd and even semester, respectively.
- Students must meet their project/thesis supervisor at least once a week to inform about their research progress.

## 5. Project & Thesis Proposal

### 5.1 Proposal Writing:

The project/thesis proposal will be approximately 2-3 pages following the formant given by the department. Student will write the proposal at the start of 4<sup>th</sup> year odd semester with the permission and the guidance of their respective supervisors. A template of “Project & thesis proposal” is available at the department website ([www.eee.ruet.ac.bd](http://www.eee.ruet.ac.bd)) and also attached in the **Annex II** named as “**Template for Proposal of Project & Thesis**”.

### 5.2 Proposal Submission:

Two copies of proposal, one for supervisor and one for departmental record, have to be submitted to the department office through the supervisor within the 3<sup>rd</sup> week of 4<sup>th</sup> year odd semester.

## 6. Defending the project & thesis

### 6.1 Pre-defense:

Students have to present their research progress by power point presentation. The presentation schedule will be announced by the department after the mid-break of 4<sup>th</sup> year odd semester. The students will prepare their power point slides containing the following topics:

- Title Page
- Outlines of Presentation
- Background
- Literature Review
- Motivation & Research Opportunity
- Objectives
- Research Methodology
- Proposed System
- Expected Outcome
- Gantt Chart
- References

The distribution of presentation time will be as follows:

- Presentation – 10 mins
- Q/A session – 05 mins

## **6.2 Final Defense:**

Students have to present their research outcome by power point presentation. The presentation schedule will be announced by the department at the end of 4<sup>th</sup> year even semester examination. The students will prepare their power point slides under the guidance of their respective supervisor.

The students will prepare their power point slides containing the following topics:

- Title page
- Outlines of Presentation
- Background
- Literature Review
- Motivation & Research Opportunity
- Objectives
- Research methodology
- Proposed system
- Modelling, Simulation, Experiments
- Results and discussions
- Addressing knowledge profile, complex engineering problems and activities
- Impact of the project/thesis outcome on the health, society, environment and sustainability
- Conclusion
- Future works
- References

The distribution of presentation time will be as follows:

- Presentation – 15 mins
- Q/A session – 5 mins

## **7. Thesis/Project Book**

### **7.1 Book Writing:**

The project/thesis book will be around 50 pages (12-point Times New Roman, 1.5-line spacing) excluding the appendix and preliminary pages. Students must begin to write their project/thesis book at least one month before the final defense date. A template for writing the project/thesis book is available in the department website ([www.eee.ruet.ac.bd](http://www.eee.ruet.ac.bd)) and also attached in the **Annex III** named as “**Template for Project & Thesis (EEE 4000) Book Writing**”. Student must write their project/thesis book according to the given format.

### **7.2 Book Submission:**

Students must submit a soft copy of the project/thesis book to the supervisor at least two weeks prior to final defense date for similarity index checking and for any modification/correction. Direct copy from any reference is strictly prohibited (maximum accepted plagiarism is 30% without references). Students will submit two hard copies (soft binding) of their book, one for internal and one for external, to the department office one week prior to the final defense date through their respective supervisor. Student must modify the book according to the comments/feedback received from the external member, if any, before submitting the final book to the department office. Four copies of hard binding thesis/project book must be submitted through the supervisor and external member for final grading and clearance (one for supervisor, one for Central library, and two for rental library).

## 8. Evaluation committee

The Evaluation committee members will be assigned by the department Head. This committee will be formed consisting project/thesis supervisor (internal), one external member related to that field of work, and selected board members from the department.

## 9. Grading policy

The undergraduate thesis & project course will be graded by the thesis/project supervisor, one external member and viva board members. The assessment tools along with the weight of marks distribution are given below. Each assessment tool has separate rubrics which is included in the **Annex IV**.

Marks Distribution	Assessment Method / Tools	
Internal Examiner (50 marks)	Thesis/Project Proposal (10)	Continuous evaluation and book evaluation (40)
External Examiner (20 marks)	Final defense and book evaluation (20)	
Viva voce (30 marks)	Pre-defense (10)	Final defense (20)
<b>Total Marks: 100</b>		

## 10. Mapping of knowledge profile, complex engineering problem and complex engineering activities (WK-WP-EA)

Program outcome (PO)		Knowledge Profile								Complex Engineering Problem							Complex Engineering Activities														
		PO (a)-PO (b)				PO (c)	PO (e)	PO (f)-PO (h)	PO (d)	PO (a)- PO (g)							PO (j)														
PO (a)	PO (b)	PO (c)	PO (d)	PO (e)	PO (f)	PO (g)	PO (h)	PO (i)	PO (j)	PO (k)	PO (l)	K1	K2	K3	K4	K5	K6	K7	K8	P1	P2	P3	P4	P5	P6	P7	A1	A2	A3	A4	A5
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Engineering Knowledge	Problem Analysis	Design of Solution	Investigation	Modern Tool Usage	Engineer & Society	Environment and sustainability	Ethics	Individual work and teamwork	Communication	Project management and finance	Life-long learning	Natural Science	Mathematics	Engineering Fundamentals	Specialist Knowledge	Engineering Design	Engineering Practice	Comprehension	Research Literature	Depth of Knowledge (K3-K6,K8)	Range of conflicting requirements	Depth of analysis required	Familiarity of issues	Extent of applicable codes	Extent of stakeholder involvement and conflicting requirements	Interdependence	Range of resources	Level of interaction	Innovation	Consequences for society and the environment	Familiarity

Students must explain how they address the attributes of complex engineering problems and complex engineering activities in their project/thesis through presentation and thesis/project report. The attributes of complex engineering problems and complex engineering activities are attached in the **Annex V**.

## 11. General Instructions for the Students to Write the Thesis/Project Book

1. Thesis/project book page size = A4.
2. Thesis/project book font “Times New Roman”
3. Thesis/project book print on single side only.
4. Margin: Left = 1.5 inch. Right = 0.7 inch, Top = 1 inch, Bottom = 1.5 inch.
5. Line Gap: 1.15 pt (Do not use unnecessary gap)
6. Thesis/project book length: Minimum 50 pages excluding the references and appendices.
7. Total number of chapters will be six (6). They are,
  - a) Introduction
  - b) Methodology
  - c) Results & Discussion
  - d) Social and Environmental Influence
  - e) Addressing Program Outcomes, Complex Engineering Problems and Activities
  - f) Conclusion and Future Plan
8. Page number of each chapter is not limited.
9. References must be included at the end of the book strictly following the IEEE format.
10. “Appendix” can be added, if necessary.
11. From “Acknowledgement” to “Publication” page, page number should be in Roman number (i.e. i, ii, iii etc.)
12. From “Chapter 1” to the end of the document, page number should be in English number (i.e. 1, 2, 3 etc.)
13. Instructions for inserting table:
  - a. The title must be above the table and center aligned.
  - b. The table should be in IEEE format.
  - c. Try to avoid color in Table.
  - d. Table should be placed either at the top or bottom of the page.
14. Instructions for inserting image:
  - a. Caption of the image must be below the image and center aligned.
  - b. For graphs both axes must be properly labeled.
  - c. Image quality should be excellent.
  - d. Maintain image ratio. Do not enlarge image unnecessarily.
  - e. Put reference after caption if accessed from some resource.
  - f. Do not put images just after title/subtitle.
  - g. Figures should be placed either at the top or bottom of the page.
15. Direct copy from any reference is strictly prohibited as all the submitted books would be subjected to plagiarism checking. (Maximum accepted plagiarism = 30% without references)
16. Hard copy cover (top and side view) is attached at the first two pages of **Annex III**.  
Use of AI Tools are strongly prohibited. AI Generated text will be checked.

# Annex I: Project & Thesis (EEE 4000) Distribution Guideline



Heaven's Light is Our Guide  
Rajshahi University of Engineering & Technology  
Department of Electrical & Electronic Engineering

## ঃ Undergraduate Supervisor নির্ধারণ পদ্ধতির নীতিমালা ঃ

১। ছাত্র-ছাত্রীর সংখ্যার ভিত্তিতে প্রত্যেক Supervisor এর জন্য ছাত্র-ছাত্রীর সর্বোচ্চ সংখ্যা নির্ধারণ করা হবে।

নির্ধারণ পদ্ধতি ঃ

- (i) ছাত্র-ছাত্রীদের Supervisor বণ্টন Seniority অনুযায়ী অনুপাতিক হারে করা হবে। এই অনুপাত Department দ্বারা নির্ধারণ করা হবে। তবে অতিরিক্ত ছাত্র-ছাত্রীদেরকে Senior Supervisor গণের মধ্যে অগ্রাধিকার ভিত্তিতে বণ্টন করা হবে। তবে কোন Supervisor আগ্রহী না হলে ক্রমানুসারে পরবর্তী Supervisor কে নির্ধারণ করা হবে।

শিক্ষক	নূন্যতম ছাত্র-ছাত্রীর সংখ্যা
অধ্যাপক (পিএইচডি)	০৮
শিক্ষক (পিএইচডি)	০৬
শিক্ষক (এমএসসি/সহকারী অধ্যাপক)	০৪
শিক্ষক (বিএসসি ইঞ্জিনিয়ারিং)	০২

\* এই নূন্যতম সংখ্যা ছাত্র এবং শিক্ষকের সংখ্যা অনুসারে পরিবর্তন হইতে পারে।

২। প্রত্যেক ছাত্র-ছাত্রীদেরকে Supervisor গণের সাথে যোগাযোগ করে Tentative Research Field ও Supervisor এর নিকট হতে e-mail/সম্মতিপত্রে সম্মতি গ্রহণ করতে হবে।

- (i) Supervisor গণ শুধুমাত্র Department দ্বারা নির্ধারিত সংখ্যক ছাত্র-ছাত্রীর আবেদনে সম্মতি প্রদান করতে পারবেন।
- (ii) Supervisor এর নিকট হতে গৃহীত সম্মতি ছাত্র-ছাত্রীদেরকে বিভাগে জমা প্রদান করতে হবে।
- (iii) ছাত্র-ছাত্রীরা একের অধিক Supervisor এর নিকট হতে সম্মতি গ্রহণ করতে পারবে না।
- (iv) ছাত্র-ছাত্রী নির্দিষ্ট সময়ের মধ্যে সম্মতি পত্র প্রদান না করলে Department তার Supervisor নির্ধারণ করে দিবে।
- (v) ছাত্র-ছাত্রীদের কে তাদের Latest Semester এর প্রাপ্ত CGPA অনুসারে দুই বা ততোধিক গ্রুপে ভাগ করা হবে। প্রথম গ্রুপ থেকে একজন Supervisor একজন ছাত্র/ছাত্রীকে সম্মতি প্রদান করতে পারবে। বাকি গ্রুপ গুলো থেকে একাধিক ছাত্র/ছাত্রী নেয়া যেতে পারে।
- (vi) কোন ছাত্র-ছাত্রীর নির্ধারিত Supervisor শিক্ষাছুটি (এম.এস.সি/পিএইচডি) অথবা লিয়েন জনিত ছুটিতে থাকলে তার/তাদের Supervisor Department দ্বারা পূর্ণনির্ধারণ করা হবে।

অধ্যাপক ড. মোঃ সোহেল রানা  
তওই কৌশল বিভাগ  
রুয়েট।

ড. আবু সাদাত মোঃ সায়েম  
সহযোগী অধ্যাপক,  
তওই কৌশল বিভাগ, রুয়েট।

ড. মোঃ আব্দুল মতিন  
সহকারী অধ্যাপক,  
তওই কৌশল বিভাগ, রুয়েট।

মোঃ ইলিয়াস রহমান  
সহকারী অধ্যাপক,  
তওই কৌশল বিভাগ, রুয়েট।

# Annex II: Template for Proposal of Project & Thesis



*Heaven's Light Is Our Guide*

Rajshahi University of Engineering & Technology

Department of Electrical & Electronic Engineering

## Proposal for Project & Thesis (EEE 4000)

<b>1.</b>	<b>Project/Thesis members</b>	:	Name I (Roll No.) Name II (Roll No.)
<b>2.</b>	<b>Tentative title of the Project/ Thesis</b>	:	
<b>3.</b>	<b>Brief description of the Project/ Thesis:</b>		
	<b>(a) Project/ Thesis Background (within 200 words):</b>		
	Mention only those activities carried out in different places as reported in publications. Please support your information by citing the relevant references. Some aspects to be addressed are: <ul style="list-style-type: none"> <li>• Context and background of the research area</li> <li>• Significance of the problem</li> </ul>		
	<b>(b) Literature Review (at least five research articles):</b>		
	Mention only those activities carried out in different places as reported in publications. Please support your information by citing the relevant references. Some aspects to be addressed are: <ul style="list-style-type: none"> <li>• Methodology</li> <li>• Key findings</li> <li>• Scope and limitations</li> </ul>		
	<b>(c) Objectives and aims of the project:</b>		
	Mention the objectives of your project/thesis <ul style="list-style-type: none"> <li>• Objective 1</li> <li>• Objective 2</li> <li>•</li> </ul>		
	<b>(d) Research Methodology</b>		
	<ul style="list-style-type: none"> <li>• Proposed approach</li> <li>• Used tools, and techniques</li> <li>• Block diagrams, algorithms, flowcharts (if applicable)</li> <li>• Implementation strategy (hardware/software/simulation)</li> </ul>		
	<b>(e) Expected Outcome</b>		
	<ul style="list-style-type: none"> <li>• Discuss the anticipated outcomes</li> <li>• Provide tables/graphs/simulated trends if possible</li> <li>• Compare with existing benchmarks or known performance</li> </ul>		

<b>(f) State how does your project/thesis address the following program outcomes (PO).</b>				
POs for EEE 4000		PO Statements		
PO(b) (Problem analysis)		Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (K1 to K4)  <i>Explanation on addressing PO(b) through this project:</i>		
PO(l) (Lifelong learning)		Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.  <i>Explanation on addressing PO(l) through this project:</i>		
<b>4. Basic facilities available in the department for the proposed investigation:</b>				
Mention the facilities available in the laboratories that are relevant to the project (if any).				
<b>5. Work Plan and Timeline:</b>				
Use a Gantt chart showing the key phases:				
<ul style="list-style-type: none"> <li>• Literature Review</li> <li>• Design/Simulation</li> <li>• Testing/Validation</li> <li>• Report writing</li> </ul>				
<b>6. Cost Estimation (if any):</b>				
Sl. No.	Item Description		Cost	
	Name of the Item	Quantity	Unit Price (BDT)	Total Cost (BDT)

<b>Project Members:</b>	<b>Supervisor:</b>
(Signature with date) 1. Name: Roll No.: Department of EEE, RUET  (Signature with date) 2. Name: Roll No.: Department of EEE, RUET	(Signature with date) Supervisor's Name Designation Department of EEE, RUET

Margin:  
Left = 1.5 inch  
Right = 0.7 inch  
Top = 1 inch  
Bottom = 1.5 inch

NAME OF THE PROJECT OR THESIS

20 Size  
fonts  
(Uppercase)

A Project/Thesis submitted in partial fulfillment for the requirement of the degree of

**Bachelor of Science in  
Electrical & Electronic Engineering**

12 Size Fonts

by

Bold  
Title Case

**Name**  
**Roll No. 1901xxx**

Heaven's Light is Our Guide



Department of Electrical & Electronic Engineering

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Rajshahi University of Engineering & Technology

16 Size Fonts

June, 2025

12 Size Fonts

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**EEE 4000**

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**Thesis Title**

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**Student ID 1  
Student ID 2**

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July  
2025

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NAME OF THE PROJECT OR THESIS ← 20 Size fonts (Uppercase)

A Project/Thesis submitted in partial fulfillment for the requirement of the degree of

Bachelor of Science in  
Electrical & Electronic Engineering

by

**Name**  
**Roll No. 1901xxx**

Bold Title Case

12 Size Fonts

Heaven's Light is Our Guide



Department of Electrical & Electronic Engineering ← 14 Size Fonts  
Rajshahi University of Engineering & Technology

June, 2025 ← 12 Size Fonts ← 16 Size Fonts

# Acknowledgement

18 Size Fonts

[Put your acknowledgements here (A demo is given below).]

This thesis has been submitted to the Department of Electrical & Electronic Engineering of Rajshahi University of Engineering & Technology, Rajshahi-6204, Bangladesh, for the partial fulfillment of the requirements for the degree of B.Sc. in Electrical & Electronic Engineering. Thesis title regards to "**THESIS/PROJECT TILTE (UPPERCASE, BOLD)**".

First and foremost, I offer my sincere gratitude and indebtedness to my thesis supervisor, [Supervisor's Name], [Designation], Department of Electrical & Electronic Engineering who has supported me throughout my thesis with his patience and knowledge. I shall ever remain grateful to him for his valuable guidance, advice, encouragement, and cordial and amiable contribution to my thesis.

I wish to thank once again [Name of the Head of the Dept. of EEE] as the head of the Department of Electrical & Electronic Engineering for his support and encouragement and also for providing all kinds of laboratory facilities.

I would like to express my deep gratitude to [Anyone who has helped you in your work]. He has always encouraged me during the research. I am also grateful to the administration of Rajshahi University of Engineering & Technology for providing a self-sufficient Undergraduate (UG) lab.

Finally, I want to thank the most important and the closest persons of my life and my parents for giving a big support to me.

[Your Name]  
Roll No. 1901xxx

[Submission month, Year]  
RUET, Rajshahi

Heaven's Light is Our Guide



← 16 Size Fonts

**Department of Electrical & Electronic Engineering  
Rajshahi University of Engineering & Technology**

**CERTIFICATE** ← 16 Size Fonts

This is to certify that the thesis entitled "**Thesis/Project Name (Title case)**" by [Name] (Roll No. 1901xxx), has been carried out under my supervision. To the best of my knowledge, this thesis is an original one and has not been submitted anywhere for any Degree or Diploma.

**Thesis Supervisor:**

.....

**[Supervisor's Name (Bold)]**

[Designation]

Department of Electrical & Electronic Engineering

Rajshahi University of Engineering & Technology

Rajshahi-6204, Bangladesh



← 16 Size Fonts

**Department of Electrical & Electronic Engineering  
Rajshahi University of Engineering & Technology**

**CERTIFICATE**

← 16 Size Fonts

This is to certify that the thesis entitled "**Thesis/Project Name (Title case)**" has been corrected according to my suggestion and guidance as an external. The quality of the thesis is satisfactory.

**External Member:**

.....  
[**External Member (Bold)**]  
[Designation]  
Department Name  
University Name

## **Abstract**

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[Put the Abstract of your work here (Maximum 200 words).]

[Your abstract must answer the following questions.]

1. What is the research problem/objective?
2. Why is the study important? (Motivation/gap)
3. What methods were used? (Experimental, simulation, etc.)
4. What were the key results? (Quantitative findings if possible)
5. What are the implications/contributions? (Impact on field/industry)

12 Size Fonts

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18 Size Fonts

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**Reference** [Strictly Follow the IEEE Format]

**Appendix**

**One can add additional subsection as per their requirements.**

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## List of Tables



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## List of Abbreviations

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# Chapter 1

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# Annex IV: Assessment Tools and Rubrics for Project & Thesis (EEE 4000)

## Rubrics for Project & Thesis (EEE 4000)

**Table 1: CO statements and their relationship with POs, learning domain, marks distribution, and assessment tools**

CO No.	CLO statement	Corresponding PLO No.	Learning Domain	Internal (50 marks)		External (20 Marks)	Viva Voce (30 Marks)	
				Thesis Proposal (10 Marks)	Final Evaluation (40 Marks)		Pre-Defense (10 Marks)	Final Defense (20 Marks)
CO1	Demonstrate the ability to apply principles of mathematics, science, and engineering to develop a system or mathematical model.	PO(a)	Cognitive Level 3 (Apply)		5 (Thesis book- System model)			
CO2	Analyze the problems for possible solutions to cover the research gaps followed by extensive revisions of existing methods.	PO(b)	Cognitive Level 4 (Analyze)	5 (Thesis book- Objectives)				
CO3	Design innovative engineering solutions considering constraints such as public, health, safety, sustainability, and cost.	PO(c)	Cognitive Level 6 (Create)		5 (Thesis book- Model/Program /Hardware Design)	5 (Thesis book- Model/Program /Hardware Design)		
CO4	Investigate the performance of the developed solution with respect to the given specifications, requirements and standards.	PO(d)	Cognitive Level 4 (Analyze)		5 (Results and Discussion)			
CO5	Demonstrate proficiency in using contemporary engineering tools and software to analyze, design, and implement engineering solutions.	PO(e)	Psychomotor Level 3 (Precise)		5 (Thesis book- Simulation and/or Implementation)	5 (Thesis book- Simulation and/or Implementation)		4 (Thesis Presentation/ Simulation and/or Implementation)
CO6	Assess the impact of the thesis/project outcome in context of, health, safety, legal, and cultural issues.	PO(f)	Affective Level 2 (Respond)					4 (Impact on Societal, Health, Safety, Legal, and Cultural Issue)
CO7	Justify the sustainability of the proposed solution in societal and environmental context.	PO(g)	Affective Level 5 (Characterize)		5 (Thesis book- Impact of the Project/Thesis on Environment and Sustainability)			
CO8	Practice ethical principle in research/ project activities and decision-making adhering professional codes of conduct.	PO(h)	Affective Level 5 (Characterize)		5 (Continuous evaluation- Originality, Responsibility, Proper citation)			4 (Originality, Proper citation)
CO9	Act effectively as an individual or as a member/leader of a team.	PO(i)	Affective Level 5 (Characterize)		5 (Continuous evaluation)			
CO10	Communicate effectively the concept and outcome of research/project through written reports and oral presentation.	PO(j)	Affective Level 3 (Value)			5 (Complete representation of the thesis book)	5 (Presentation and Q & A)	4 (Presentation and Q & A)
CO11	Organize projects/thesis within time and budget constraints.	PO(k)	Affective Level 4 (Organize)		5 (Continuous evaluation)			4 (Project/thesis Management and Finance)
CO12	Develop the capability of acquiring new knowledge and skills to remain updated in engineering practice and adjust to emerging technological needs.	PO(l)	Affective Level 2 (Respond)	5 (Thesis book- Lit. review, Future work)		5 (Thesis book- Lit. review, Future work)	5 (Reflection of independent learning)	

## Rubrics for Project & Thesis (EEE 4000)

**Table 2: Rubrics for Thesis/Project Proposal Evaluation (Supervisor) of EEE 4000: Project & Thesis**

Category	Source	CO	PO	Excellent (5)	Good (4)	Satisfactory (3)	Need improvement (2)	Poor (1)
<b>Objectives</b>	Thesis Proposal: Objectives	CO2	PO(b)	Objectives are concise, clearly stated, motivating, fills-up the current research gaps.	Objectives are not motivating, clearly stated, fills-up the current research gaps.	Objectives are not motivating, clearly stated, does not fill-up the current research gaps.	Objectives are not motivating, vaguely stated, does not fill-up the current research gaps.	Objectives need improvement.
<b>Life-long learning</b>	Thesis Proposal: Literature review	CO12	PO(l)	Thoroughly reviewed relevant literatures with critical evaluation of contributions, research gaps, and suggested meaningful solutions with future directions.	Thoroughly reviewed relevant literatures with critical evaluation of contributions, research gaps, and suggested basic solutions and future directions.	Reviewed relevant literatures with critical evaluation of contributions, and research gaps, but failed to suggest solutions and future directions.	Reviewed relevant literatures with critical evaluation of contributions, but missed some major research gaps, and failed to suggest solutions and future directions.	Reviewed relevant literatures with critical evaluation of contributions, but did not mention anything about research gaps, and suggested no solution and future direction.

## Rubrics for Project & Thesis (EEE 4000)

**Table 3: Rubrics for Internal Final Evaluation (Supervisor) of EEE 4000: Project & Thesis**

Category	Source	CO	PO	Excellent (5)	Good (4)	Satisfactory (3)	Need improvement (2)	Poor (1)
System Model	Thesis Book: System Model	CO1	PO(a)	System model contains novel parts, clearly described with figures, mathematical model is available, system parameters are clearly stated.	System model contains no novel part, clearly described with figures, mathematical model is available, system parameters are clearly stated.	System model contains no novel part, vaguely described with figure, mathematical model is available, system parameters are clearly stated.	System model contains no novel part, vaguely described with figure, mathematical model is not available, system parameters are clearly stated.	System model contains no novel part, vaguely described with figure, mathematical model is not available, system parameters are not clearly stated.
Engineering Design	Thesis book: Model/Program /Hardware Design	CO3	PO(c)	The design of the proposed work has sufficient novelty, methodology is comprehensive, has strong literature support, and addresses feasibility	The design of the proposed work has moderate novelty, methodology is comprehensive, has strong literature support, and addresses feasibility	The design of the proposed work has moderate novelty, methodology is not rigorous, has strong literature support, and addresses feasibility	The design of the proposed work has moderate novelty, methodology is not rigorous, has moderate literature support, and did not address feasibility	The design of the proposed work has minimum novelty, methodology is not rigorous, has poor literature support, and did not address feasibility
Results and Discussion	Thesis book: Results and Discussion	CO4	PO(d)	Result is investigated thoroughly, results are taken following given specifications, and meets standards.	Result is investigated concisely, results are taken following given specifications, and meets standards.	Result is investigated concisely, results are taken following given specifications, but does not meet standards.	Result is investigated concisely, results are not taken following given specifications, but does not meet standards.	Results are unclear.
Simulation and/or Implementation using software/modern tools	Thesis book: Simulation and/or Implementation	CO5	PO(e)	Exceptional implementation or simulation using advanced tools; results are comprehensive, well-analyzed, and directly address research objectives.	Strong implementation or simulation with appropriate tools; results are relevant and analyzed, though may lack minor depth.	Adequate implementation or simulation; results are relevant but analysis is basic or superficial.	Limited implementation or simulation; results show minimal relevance or weak analysis, with some use of tools.	Poor or no implementation/simulation; results are irrelevant or unsupported, with little to no use of modern tools.
Environment and Sustainability	Thesis book: Impact of the Project/Thesis on Environment and Sustainability	CO7	PO(g)	The proposed solution improves the sustainability issue in an environment friendly.	The proposed solution improves the sustainability issue and is environmentally neutral.	The proposed solution improves the sustainability issue but ignores the environmental impact.	The proposed solution does not improve the sustainability issue and ignores the environmental impact.	The proposed solution is not sustainable and its effect on environment is questionable.

## Rubrics for Project & Thesis (EEE 4000)

Category	Source	CO No.	PO	Excellent (5)	Good (4)	Satisfactory (3)	Need improvement (2)	Poor (1)
Ethical principle in thesis/project activities and decision-making adhering professional	Continuous evaluation: Originality, responsibility, proper citation	CO8	PO(h)	The work is an original one, the student acted responsibly throughout the research journey, and always cited the right source.	The work is an original one, the student acted responsibly throughout the research journey, but some required citations were missed.	The work is an original one, the student sometimes did not act responsibly throughout the research journey, but some required citations were missed.	The work is an original one, the student did not act responsibly at all throughout the research journey, and missed several required citations.	The originality of the work is questionable, the student did not act responsibly at all throughout the research journey, and missed several some required citations.
Individual and/or team work	Continuous evaluation	CO9	PO(i)	Demonstrates exceptional ability to work independently and collaboratively, with clear contributions, effective communication, and successful teamwork outcomes.	Shows strong capability in both individual and team settings, with clear contributions and effective communication, though minor improvements are needed.	Adequate performance in individual and team settings, with some contributions and basic communication; some areas need improvement.	Limited performance in individual and team settings, with minimal contributions and weak communication; several areas need improvement.	Poor or no demonstration of individual and team work; contributions are unclear or absent, with ineffective communication.
Organize projects/thesis within time and budget constraints.	Continuous evaluation	CO11	PO(k)	Strictly maintains the timeline for the completion of thesis/project, including detailed planning, resource allocation, budgeting, and risk management; shows comprehensive understanding of financial aspects.	Strictly maintains the timeline for the completion of thesis/project with effective planning, resource allocation, and budgeting; good understanding of financial aspects with minor gaps.	The timeline for different phase is exceeded but the thesis completion is maintained within deadline with basic planning, resource allocation, and budgeting; some understanding of financial aspects but lacks depth.	The timeline for different phase is exceeded but the thesis completion is maintained within deadline with minimal planning and budgeting; weak understanding of financial aspects and resource allocation.	The deadline for thesis completion is exceeded, also, it lacks planning, budgeting, and understanding of financial aspects and resource allocation.

## Rubrics for Project & Thesis (EEE 4000)

**Table 4: Rubrics for External Examiner Evaluation of EEE 4000: Project & Thesis**

Category	Source	CO	PO	Excellent (5)	Good (4)	Satisfactory (3)	Need improvement (2)	Poor (1)
Engineering Design	Thesis book: Model/Program /Hardware Design	CO3	PO(c)	The design of the proposed work has sufficient novelty, methodology is comprehensive, has strong literature support, and addresses feasibility	The design of the proposed work has moderate novelty, methodology is comprehensive, has strong literature support, and addresses feasibility	The design of the proposed work has moderate novelty, methodology is not rigorous, has strong literature support, and addresses feasibility	The design of the proposed work has moderate novelty, methodology is not rigorous, has moderate literature support, and did not address feasibility	The design of the proposed work has minimum novelty, methodology is not rigorous, has poor literature support, and did not address feasibility
Use of software/modern tool	Thesis book	CO5	PO(e)	Effectively apply a wide range of modern engineering tools and software with advanced features to analyze develop innovative solutions, and execute them with successful outcomes.	Proficient use of tools and software with minor refinements possible. Introduces creative approaches contributing significantly. Achieves satisfactory outcomes.	Shows some creativity, using tools/software appropriately. Adequate execution, occasional integration challenges.	Limited creativity, basic tool/software application. Limited success with respect to expected outcome.	Lacks creativity, ineffective tool/software use for problem-solving. Fails to execute effectively, incomplete or ineffective outcomes.
Complete representation of the thesis book	Thesis book	CO10	PO(j)	Concepts and outcomes are exceptionally clear, precise, and easy to understand. Thesis book is exceptionally well-structured. Exceptional use of relevant evidence and examples to support conclusions.	Concepts and outcomes are clear and mostly easy to understand. Thesis book is well-organized. Good use of relevant evidence and examples to support conclusions.	Concepts and outcomes are generally clear but may lack some precision. Thesis book is adequately organized with a coherent structure. Content covers most key aspects adequately but lacks depth in some areas.	Concepts and outcomes are unclear or confusing in several places. Thesis book lacks clear structure. Limited use of evidence and examples, which are not always relevant or clear.	Concepts and outcomes are completely unclear and confusing throughout. Thesis book is poorly structured. Language is extremely poor, hindering understanding and readability.
Life-long learning	Thesis book- Literature review, Future work	CO12	PO(l)	Thoroughly reviewed relevant literatures with critical evaluation of contributions, research gaps, and suggested meaningful solutions with future directions.	Thoroughly reviewed relevant literatures with critical evaluation of contributions, research gaps, and suggested basic solutions and future directions.	Reviewed relevant literatures with critical evaluation of contributions, and research gaps, but failed to suggest solutions and future directions.	Reviewed relevant literatures with critical evaluation of contributions, but missed some major research gaps, and failed to suggest solutions and future directions.	Reviewed relevant literatures with critical evaluation of contributions, but did not mention anything about research gaps, and suggested no solution and future direction.

## Rubrics for Project & Thesis (EEE 4000)

**Table 5: Rubrics for Viva Voce at Pre-defense of EEE 4000: Project & Thesis**

Category	CO	PO	Excellent (5)	Good (4)	Satisfactory (3)	Need improvement (2)	Poor (1)
Presentation and Q & A	CO10	PO (j)	Clear, coherent, and motivational oral presentation. Good eye contact. Understands the audience. Well prepared and organized slides. Excellent use of visual aids. Quickly grasped questions, clear and apt responses. good control of both theory and findings	Good and coherent oral presentation. Good eye contact. Understands the audience. Well prepared presentation. Good use of visual aids. Mostly clear, good grasp of material, only occasional stumbles, minor uncertainty on some facts or details	Mostly coherent oral presentation. Fairly well prepared and organized slides. Good use of visual aids. Occasional confusion or lack of clarity, occasional gaps in theory or important details, somewhat nervous or jittery	Inconsistent presentation with limited eye contact and visual aids. Confusion or lack of clarity; gaps in theory or details are frequent. Presentation appears nervous or jittery.	Poor oral presentation. Disorganized presentation. Responses are unclear or incorrect. Presentation lacks coherence and confidence.
Reflection of independent learning	CO12	PO(l)	Provides an in-depth reflection of new skills acquired, detailing the development process, Challenges faced, applications, lessons learned, and future goals.	Offers a clear reflection of new skills with good detail about the development process and applications, including some lessons learned.	Provides a basic reflection with limited detail on new skill development and applications, mentioning few lessons learned.	Lacks depth in reflection; minimal detail on new skill development and vague applications or lessons learned.	Fails to reflect meaningfully on new skills, with unclear descriptions and no connection to personal growth.

## Rubrics for Project & Thesis (EEE 4000)

**Table 6: Rubrics for Viva Voce at final defense of EEE 4000: Project & Thesis**

Category	CO	PO	Excellent (4)	Satisfactory (3)	Need improvement (2)	Poor (1)
Simulation/ Implementation	CO 5	PO(e)	Represent strong evidence of perform simulation and/or implementation by proper use of modern tools and/or software.	Represent satisfactory evidence of perform simulation and/or implementation by proper use of modern tools and/or software.	Attempts to use tools/software but lacks proficiency; implementation is basic or flawed	Little to no use of modern tools/software; ineffective or incorrect implementation attempts.
Impact on Societal, Health, Safety, Legal and Cultural Issue	CO 6	PO(f)	Provides an analysis that comprehensively covers one or more societal, health, safety, legal, and cultural issues with exceptional depth, thoroughly exploring each aspect and integrating them well into the discussion.	Provides an analysis that adequately covers one or more societal, health, safety, legal, and cultural issues, though some aspects may lack depth or integration.	Provides an analysis that covers one or more of the issues but lacks depth and integration, with some aspects superficially addressed.	Provides an analysis that is incomplete or poorly covers one or more societal, health, safety, legal, and cultural issues, with many aspects missing or inadequately addressed.
Originality And proper citation	CO 8	PO(h)	The work is an original one, always cited the right source.	The work is an original one but some required citations were missed.	The work is an original one and missed several required citations.	The originality of the work is questionable and missed several some required citations.
Presentation and Q & A	CO 10	PO (j)	Clear, coherent, and motivational oral presentation. Good eye contact. Understands the audience. Well prepared and organized slides. Excellent use of visual aids. Quickly grasped questions, clear and apt responses. good control of both theory and findings	Mostly coherent oral presentation. Fairly well prepared and organized slides. Good use of visual aids. Occasional confusion or lack of clarity, occasional gaps in theory or important details, somewhat nervous or jittery	Inconsistent presentation with limited eye contact and visual aids. Confusion or lack of clarity; gaps in theory or details are frequent. Presentation appears nervous or jittery.	Poor oral presentation. Disorganized presentation. Responses are unclear or incorrect. Presentation lacks coherence and confidence.
Project/thesis Management and Finance	CO 11	PO(k)	Provides a project/thesis that demonstrates exceptional planning with a clear, detailed, and well-structured timeline and realistic budget to meet all deadlines and expenditure.	Provides a project/thesis that demonstrates adequate planning and organization, with a reasonable timeline and an adequate budget where some financial resources and deadlines are met, though there may be minor delays.	Provides a project/thesis that shows basic planning and organization, with a vague or incomplete timeline and budget where several financial resources and deadlines are missed or delayed.	Provides a project/thesis that demonstrates poor planning and organization, with no clear timeline and budget where most financial resources and deadlines are missed or significantly delayed.

## Addressing Complex Engineering Problems

The project & thesis must include the Complex Engineering Problems mentioned in Table 1. Student should provide a brief description how these complex engineering problems are addressed in this project & thesis. The attributes of complex engineering problems and complex engineering activities are given below:

Table 1: Complex Engineering Problem Solving through the Project & Thesis (EEE 4000)

Attributes	Statement
Depth of knowledge required (P1)	Requires research-based knowledge, much of which is at, or informed by, the forefront of the professional discipline and that allows a fundamental- based, first principles analytical approach
Range of conflicting Requirements (P2)	Involve wide-ranging or conflicting technical, engineering and other issues
Depth of analysis required (P3)	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models
Familiarity of issues (P4)	Involve infrequently encountered issues
Extent of applicable codes (P5)	Are outside problems encompassed by standards and codes of practice for professional engineering
Extent of stakeholder involvement and conflicting requirements (P6)	Involve diverse groups of stakeholders with widely varying needs
Interdependence (P7)	Are high-level problems including many component parts or sub-problems

## Addressing Complex Engineering Activities

The project & thesis must include the Complex Engineering Activities mentioned in Table 2. Student should provide a brief description how these complex engineering activities are addressed in this project & thesis. The attributes of complex engineering activities are given below:

Table 2: Complex Engineering Activities Solving through the Project & Thesis (EEE 4000)

Attributes	Statement
Range of resources (A1)	A1: Involve the use of diverse resources (and for this purpose resources include people, money, equipment, materials, information and technologies)
Level of interaction (A2)	A2: Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues
Innovation (A3)	A3: Involve creative use of engineering principles and research based knowledge in novel ways
Consequences for society and the environment (A4)	A4: Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation
Familiarity (A5)	A5: Can extend beyond previous experiences by applying principles-based approaches

## Addressing Program Outcomes

Student should mention the section and paragraph where these POs are addressed. Provide a brief description how these POs are addressed in this thesis.

Table 3: Program Outcomes (POs) of the Project & Thesis (EEE 4000)

<b>Program Outcome (PO)</b>	<b>Statement</b>	<b>Addressing the PO</b>
PO(a)	Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in K1 to K4 respectively to the solution of complex engineering problems. (Engineering knowledge)	System model
PO(b)	Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (K1 to K4) (Problem analysis)	Objectives
PO(c)	Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (K5) (Design/Development of solutions)	Model/Program/Hardware design
PO(d)	Conduct investigations of complex problems using research-based knowledge (K8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions. (Investigation)	Results and discussion
PO(e)	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (K6) (Modern tool usage)	Simulation and/or implementation
PO(f)	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (K7) (The engineer and the society)	
PO(g)	Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (K7) (Environment and sustainability)	Impact of project/thesis on environment and sustainability

PO(h)	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (K7) (Ethics)	
PO(i)	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings. (Individual work and teamwork)	
PO(j)	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. (Communication)	
PO(k)	Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. (Project management and finance)	
PO(l)	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. (Lifelong learning)	Literature review