

<b>Module Title</b>	<b>: Basic Research Methods and Seminar</b>
<b>Module Code</b>	<b>: PRW302</b>
<b>Programme</b>	<b>: B.E. Power Engineering</b>
<b>Credit</b>	<b>: 12</b>
<b>Module Member</b>	<b>: Mr. Hemlal Bhattarai</b>
<b>Module Coordinator</b>	<b>: Mr. Hemlal Bhattarai</b>

### **General Objective**

This module will introduce and orient students towards basic research in engineering so as to identifying engineering problem and devising methods to address it. It will enable the students to introduce the concept of research and innovation aspects so as to well prepare for taking up the major project work and other scholarly activities. Also, it will develop interpersonal communication skills and managerial skills when student identify, plan and execute the problems and do needful presentation.

### **Learning Outcomes**

At the end of this module the students are expected to be able to:

- State/foresee small scale engineering problems.
- Apply proper planning procedures in solving such problems.
- Disseminate research skills in engineering problems
- Design small scale engineering discrete works /projects.
- Relate theoretical concept into practice through findings.
- Develop skills to work in groups or independently.
- Demonstrate engineering report writing skills.
- Develop presentation skill

### **Learning Objectives**

- Critically review the philosophy and principles underpinning PBL to work on real life problems.
- Lead, collaborate and work in a multi-cultural multi-disciplinary team environment
- Apply proper planning procedure in solving problems creatively.
- Disseminate research skills.
- Design small scale engineering discrete works/prototypes.
- Relate theoretical concept into practice through findings.

### **Learning and teaching approach**

Student will be made into groups or individual mini project topic will be invited from student. Student need to find out small scale engineering problem and work on it. The staff will be appointed as Instructor and Mentors to provide timely guidance and supervise the students' progress in the mini project.

Lecture	: 1 hour/week
Tutorial	: 2 hours/ week
Individual works	: 7 hour/week

## **Roles and Responsibilities**

### **Instructors**

- Minimized lecture sessions in order to facilitate student-centred learning (PBL process)
- Encourage students to explore challenges in learning
- Play the role of supervisor/guide.
- Listen to students attentively to their challenges and also fund that are taking place in the team.
- Ask questions that triggers students thinking
- Challenge students to think critically thereby enabling students to link theoretical knowledge with real life problems.
- Evaluate and validate resources required by the students.
- Facilitate a platform for students to debate over major issues and provide reflections on their learning.

### **Mentors**

- Act as link between students and instructors
- Encourage equal participation from all the stakeholders
- Be logical in composing the team
- Make the team to set clear action plan
- Ensure all the teams to be on the same boat.
- Ensure timely feedback from tutor/student.
- Ensure that all logistics are put in place.

### **Support Staff:**

- Where applicable, e.g., Laboratory Technicians/Assistants if the use of laboratory is required. Administrative staff for logistic arrangements etc.

### **Assessment approach: (Details shown in Table)**

<b>Continuous assessment</b>	<b>: 50 marks</b>
<b>Semester End</b>	<b>: 50 marks</b>

**Note: Refer assessment format for project work for details.**

### **Evaluation Team and Methodology:**

- Peer feedback and Instructor and Mentors' evaluation.
- Presentation and panel members evaluation.
- Report evaluation by relevant department(s).

## Subject matter

### Part A: Basic of Research Methodology

**Introduction:** Meaning, objective, motivation, types of Research. Research approaches, significance, research method versus methodology, PBL approached for problem identification, how research is done (process-PBL approaches), problem encounter by researchers

**Research Problem and Design:** Defining and selecting research problem PBL approaches, techniques involved, defining and needs of research design, different research design with simple PBL example.

**Data collection, processing and analysis:** various methods of collection, processing and analysis of data.

**Testing and report writing:** Various test methods, characteristics, interpretation and report writing, steps in reports, types of reports, precautions.

### Part B: Mini Project

PBL based projects in a group of (3 – 5) students. Projects will be from relevant issues that will address the needs of the community and stakeholders in the field. All stakeholders will work as a team to address real life problems. The final report must be as per the format set by the college.

**Table –: Mini Project Marking Scheme**

Areas to be evaluated		Marks
<b>CA</b>		<b>50.00</b>
<b>1</b>	<b>Regular Work [By project Instructor and Mentor (s)]</b>	<b>30.00</b>
	i Actual work involvement	8.00
	ii Team sprit & work culture	3.00
	iii Conceptual understanding	2.00
	iv Analysis & interpretation capability	3.00
	v Literature Review	2.00
	vi Planning & execution/ compliance in carrying out Instructor and Mentors instruction	2.00
	vii Time Management	2.00
	viii Technical writing skills	5.00
	ix Conference paper writing	3.00
<b>2</b>	<b>Mid Term Review</b>	<b>20.00</b>
<b>Semester End</b>		<b>50.00</b>
<b>3</b>	<b>Report Evaluation</b>	<b>20.00</b>
	i Theme of the project/ originality of the idea	4.00
	ii Reliability/ Practicality	2.00
	iii Format & presentation/description style	2.00
	iv Abstract/ Introduction	1.00
	v Reasons for specific mode of implementation	2.00
	vi Information content	4.00
	vii Conclusion/ analysis & finding	5.00

<b>4</b>	<b>Presentation</b>		<b>30.00</b>
	i	Introduction	3.00
	ii	Presentation Techniques	3.00
	iii	Content	5.00
	iv	Language	2.00
	v	Confidence	2.00
	vi	Response to questions	5.00
	<b>Total Marks</b>		<b>100</b>

**Final deliverables and Dissemination Events:**

- Proposal presentations,
- mid-term review,
- presentations,
- final report,
- posters,
- conference papers, and
- prototypes where applicable.

**Reading lists**

**i. Essential Reading**

1. Kothari, C.R, (2004) “Research Methodology”, Wiley Edition
2. John, W. B., Kahn, V, “Research in Education”, PHI Publication.
3. Kumar, R. “Research Methodology- A step by step guide for beginners”, Pearson Education
4. Borrego, M., Douglas, E. P., Amelink, C. T., “Quantitative, Qualitative, and Mixed Research Methods in Engineering Education”, Journal of Engineering Education
5. Creswell, J, W., (2002) “Research Design: Qualitative, Quantitative, and Mixed Methods Approaches”, Sage Publication, New York.
6. Shavelson, R., Towne, L., (2002), “Scientific Research in Education”, National Academies Press.

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