Module Code and Title : PRW405 Project Work

Programme : BE in Mechanical Engineering

Credit : 24

Module Tutor : All tutors

Module Coordinator :

General Objective

This module aims to provide students an opportunity to undertake a significant project to investigate an engineering, design or practical research problem. The project will allow students to implement project management skills, understand the factors influencing team-working and good leadership as well enable them to complete an investigation into an engineering design topic. Further, the module aims to help students apply and integrate knowledge gained in the earlier years of study on the programme.

Learning Outcomes

On completion of the module, student will be able to:

- Define the scope of a project through background research, including consideration of the technical and economic implications, risks and ethical issues.
- Formulate solutions to the identified problems related to the project
- Design, implement and evaluate the selected solution to a problem
- Plan the activities necessary to execute and complete the project within a given time frame.
- Apply existing or acquired engineering knowledge to the investigation, analysis and solution of a problem using a systematic engineering approach
- Work effectively as a member of a project group
- Produce a well-structured final project report, incorporating and justifying all aspects of the project work and defend the work in an oral presentation.
- Write a technical paper for publication.

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

Students will be divided into groups of 3-6 members. Each group will have to carry out a project of their common interest in the relevant field. The group will be divided on the basis of academic merit ranking till 5th semester (Year III, Semester I). The programme committee will have to ensure that not all the top ranked students are grouped together. Group division and appointment of Instructor and Mentor shall be done before the end of 6th semester (Year III, Semester II).

A tutor with a minimum of Master Qualification will be appointed as project Instructor for each group. Tutors without experience in project supervision or without required qualification may be appointed as Mentor. A tutor may Instructor and Mentor more than one group. The students may choose their Instructor and Mentor(s) from the pool of tutors within the department or from other department within the college. If the tutor from other department is chosen, students will have to seek prior consent from the concerned tutor as well as from concerned Head of Department. However, the appointment of Instructor and Mentor(s) will have to be endorsed in the programme committee.

The project work will commence in the 7th semester (Year IV, Semester I) and complete in 8th semester (Year IV, Semester II). The timeline given in the following table will be followed for the project work.

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.

Subject matter:

Problem Identification and Preparation phase

Part A: Orientation/information disseminations (Week 1 – 2)

- Awareness
- Motivation
- Interdisciplinarity

Part B: Group formations/allocation of responsibilities (Week 1 – 2)

- Report writing
- Evaluation process

Part C: Topic selection (Week 3)

- Brain storming
- Problem identification

Part D: Demonstration/Site visit based on selected topics (Week 3 – 4)

- Observations
- Review the status
- Feasibility analysis of the topic/ Amendment of topic if required
- Work distribution

Part E: Proposal presentations to the department (Week 5)

- Methodology
- Time line/work plan/Amendment
- Learning outcome
- Finalizations

Part F: Literature review / Feasibility study (Week 5 – 6)

- Understanding background concept
- Review of earlier work

Part G: Course work implementation (Week 6 onward)

- Design, simulate/fabrication/prototyping/modelling/analyzing

Part H: Progress presentations/reporting (Week 8, 11, 18 & 25)

- Evaluation of students' ongoing work
- Feedback on contents/ presentation/ reporting

Part I: Finalization of course work (Week 28)

- Preparation and finalization
- Final report including prototype / model/simulation

- Conference paper
- Evaluation of students' project report/prototype/model by panel members

Each project group must maintain a log book to keep brief record of activities carried out. The log book must be endorsed by Instructor and Mentor in regular interval to keep track of project progress.

During the review, students will present the progress of their work to a panel arranged by the department. The panel may include relevant external member(s).

In order to encourage publication of project works, the office of DRIL will facilitate and organize annual students' research meet toward end of final semester.

Approach	Hours per week	Total Credit Hours
Interaction with project Instructor and Mentor(s) either for guidance or to discuss progress	1 per semesters for 1 year	30
Self-directed learning/ Independent group work	7 per semesters for 1 year	210

Assessment Approach:

The project work will be assessed in four parts as shown below:

Internal Continuous assessment	: 60 marks
Project report	: 20 marks
Final project presentation	: 15 marks
Technical paper submission and publication	: 5 marks
Total	**: 100 marks**

The detail marking scheme for assessment parts is shown in the following table:

Area to evaluated			Marks
1	**Continuous Assessment**		**60**
	1.1	Proposal Presentation	10
	1.2	1st review	10
	1.3	2nd review	10
	1.4	3rd review	10
	1.5	Regular work (assessed by Instructor and Mentor)	20
2	**Report evaluation (by panel including external member)**		**20**
	2.1	Abstract	1

	2.2	Introduction	1
	2.3	Literature review	3
	2.4	Technical content	5
	2.5	Results	5
	2.6	Originality	2
	2.7	Practicality	2
	2.8	Conclusion	1
3	**Project Presentation (by panel including external member)**		**15**
	3.1	Presentation Techniques	2
	3.2	Content	4
	3.3	Response to the Questions	7
	3.4	Language (verbal clarity) and confidence	2
4	**Technical paper writing and submission**		**5**
Total marks			**100**

Proposal presentation will consist of 15 minutes oral presentation to the panel, followed by 15 minutes questions and answers session. The panel may ask any member to present. The marking scheme will be as given below:

Proposal Presentation	**10**
Aim and objectives	2
Methodology	4
Expected outcome	1
Feasibility	1
Originality and practicality	1
Work plan	1

During the project reviews, any one of the members will be asked by the panel member to present the progress. The presentation will be of 10 minutes, followed by 15 minutes questions and answers session. The content of the presentation will be from whatever progress the groups have made since the last review.

Project Review Presentation	**10**
Work progress	6

Response to questions	3
Future work	1

The project group members will be continuously assessed by the respective project Instructor and Mentor. The assessment will be based on the details provided in the table below:

Regular Work (by respective project Instructor and Mentor)	**20**
Actual work involvement	2
Team spirit and work culture	2
Conceptual understanding	2
Creativity	2
Punctuality	2
Planning and execution\ compliance in carrying out Instructor and Mentor(s) instruction	2
Technical background materials collection	2
Time management	2
Technical writing skills	2
Computational\logical ability	2

Pre-requisites: PRW303 Research Methodology

Subject Matter:

This will depend on students' interest and Instructor and Mentor's expertise. The final report must be as per the format set by the college.

Reading list:

All the relevant reading materials from library, conference paper, journal articles or any other sources.

Date: November 2018