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Standard Operating Procedure

Project-Based Learning (PBL)

1. Purpose

The purpose of this Standard Operating Procedure (SOP) is to establish precise guidelines and instructions for undergraduate students on submitting Project-Based Learning (PBL) reports to the College/University. PBL involves learning through the process of design and development.

2. Scope

In the PBL, students will integrate and apply the knowledge and skills of various domains by making multidisciplinary projects. It will also help in the development of critical thinking and evaluation. It will help in developing 21st century success skills such as critical thinking, problem-solving, communication, collaboration and creativity/innovation among the students.

3. Learning Objectives

- To integrate knowledge and skills from diverse courses through multidisciplinary projects.
- To foster critical thinking and evaluation skills.
- To cultivate 21st-century success skills including critical thinking, problem-solving, communication, collaboration, and creativity/innovation.
- To enhance the deep understanding of academic, personal, and social development among the students.

4. Course Outcomes

On successful completion of the course, students will be able to:

- Analyze the real-life problems of various domains such as Science, Engineering & Technology, and global perspectives.
- Evaluate the suitable methods, technologies, or solutions in comparison of existing tools/methods.
- Design solutions to complex problems using a systematic approach that includes problem identification, formulation, and resolution.



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- d) Create a Product, Service, Method, Technology by applying the knowledge, analysing and evaluating all relevant aspects.

5. Roles and Responsibilities

5.1 Student

The role of the student is to manage and complete the project within the period under the guidelines provided by the University/College. The responsibilities of the student are:

- To form a group of 2-4 students. Group members will brainstorm and discuss the concepts/ideas of PBL with the allocated Mentor/Supervisor.
- The group will carry out the literature survey and collect required material for carrying out the project.
- The group will prepare a project proposal and discuss it with the supervisor. After incorporating these suggestions, final proposal would be submitted to PBL coordinator.
- The assessment of the performance of students should be made at least in three phases in the semester as per the curriculum. **Annexures 1, 2 & 3** are attached herewith for continuous evaluation of student's phase-wise.
- The group will prepare a report not exceeding 40 pages at the end of the semester.
- Submit three spiral/hardbound copies of the Project as per the guidelines given by the College/University after getting the approval from HoD/Supervisor by the specified deadline.

5.2 Supervisor

The Supervisor is normally a full-time faculty member of the Department/College. The primary roles of the supervisor are (a) To take the project classes of the students of the respective groups as per the time table. (b) To provide academic guidance to the student throughout the report; (c) To advise the student on the University regulations and deadlines for completion of the project; (d) To take the phase-wise presentation as per the scheduled period; (e) To reach an independent judgment on the quality of the report and to record this assessment on the appropriate annexures. The responsibilities of the supervisor are to:

- Ensure that every student registered for the project is attending the project classes/sessions.
- Keep a record of the attendance & also record the phase-wise presentation of individual students.



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3. Inform HoD/Principal requiring serious difficulties that may affect the timely completion of the project.
4. Check the project report to ensure that it complies with the formatting requirements in these guidelines.
5. Schedule the assessment of the project phase-wise and submit all required documents to the concerned office for further process.

6. Requirements for Project Submission

Project-Based Learning (PBL) will be an integral part of UG Programs at different levels. In the semester whenever PBL is offered as a separate Course, Credits will be allotted as per the requirement of the Programme. Each faculty will Mentor/ Supervise for 5 to 10 groups. Each group may have up to a maximum of 4 students. Faculty Mentor/Supervisor will be allotted 2 hours/week to conduct PBL for assigned groups of students for follow-up and instructions and assessment. Students will select a topic of their choice from the syllabus of any course offered in the respective semester (in -line with sustainable development goals).

7. Report Preparation

Each group will be required to submit a Project Report at the end of the semester. The guidelines for preparing the report are mentioned below:

The report shall be arranged in the sequence as per the following format & layout plan:

- a) Top cover (**Appendix-1**)
- b) Preliminary pages.
 - (i) Title page (**Appendix-2**)
 - (ii) Declaration (**Appendix-3**)
 - (iii) Certificate (**Appendix-4**)
 - (iv) Acknowledgment (**Appendix-5**)
 - (v) Abstract (Approx 300 words with 5 keywords) (**Appendix-6**)
 - (vi) Table of Contents (**Appendix-7**)
 - (iv) List of Figures and Tables (**Appendix-8**)



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- c) Chapters (Main Material)
 - 1. Introduction
 - 2. Literature Review
 - 3. Methodology
 - 4. Results & Discussion
 - 5. Conclusion
- d) Appendices, If any.
- e) Bibliography/References in APA style. (Appendix-9)

8. Continuous Evaluation

8.1 Deadline for phase-wise continuous evaluation of Project

The deadline for evaluation of PBL report will be as follows. Phase-I, II, III evaluation will be done by the panel of two internal experts which may include supervisor also. Evaluation of Phase-IV would be done at the end of semester by an external expert with an internal examiner.

- i) Phase-I (within 4 weeks of starts of semester): Students will present their project proposal to the panel.
- ii) Phase-II (within 8 weeks of starts of semester): Students will make a presentation to show the progress of the work. Such as questionnaire design, Data Collection, Data analysis etc.
- iii) Phase-III (within 12 weeks of starts of semester): Students will present the final outcome in terms of finding/idea/prototype/working model along with the project report.
- iv) Phase-IV (within 14 weeks of starts of semester/End of Semester): Mentor/Supervisor will ensure the quality of work including the result, discussion and conclusion. The report duly signed by the students, Supervisor/Mentor and HoD/Principal will be submitted to Project Coordinator.

9. Evaluation Criteria

Phase-I Continuous Evaluation would be done as per the parameters given in **Annexure-1**.

Phase-II Continuous Evaluation would be done as the parameters given in **Annexure-2**.

Phase-III Continuous Evaluation would be done as the parameters given in **Annexure-3**.

Phase-IV External Evaluation would be done as the parameters given in **Annexure-4**.



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10. Expert Committee:

The internal evaluation committee shall consist of internal faculty members constituted by the College which would be comprised of at least two expert members. The student's supervisor may be special invitee to the presentation. The presentation session shall be an open house session. The internal marks would be the average of the marks given by each expert of the committee.

11. Evaluation Marks:

The Marking shall be as follows.

Internal: 50 marks

Phase wise marks will be awarded the internal marks as per **annexure-1, 2, 3.**

External: 50 marks

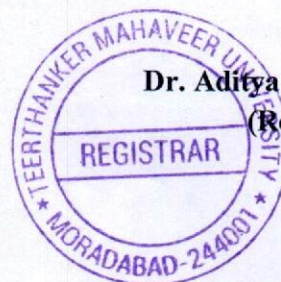
By External examiner appointed by the University & will give the marks as per **annexure-4.**

This SOP will serve as a comprehensive guide for undergraduate students on the submission of project/PBL reports. Students need to adhere to these guidelines to ensure the smooth and efficient handling of their academic submissions.

Enclosures:

1- Appendix (1-9)

2- Annexures (1-4)



for
Dr. Aditya Sharma
12/7/24
Dr. Aditya Sharma
(Registrar)



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(Appendix-1)

Top Cover- The sample top cover shall be as Under:

TITLE OF THE PROJECT

NAME OF THE STUDENT

(PROGRAMME)

STREAM, SEMESTER & SECTION

Department of



Accredited with NAAC **A** Grade

12-B Status from UGC

COLLEGE.....

TEERTHANKER MAHAVEER UNIVERSITY

MORADABAD-244001

MONTH AND YEAR

Handwritten signature



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(Appendix-2)

Title Page: The Title Page cover shall be as under

Title of the PROJECT

Submitted in Partial fulfilment of the requirement for the degree of

Programme Name

by

Name of Student in capital Letters

(Enrolment No.)



Accredited with NAAC **A** Grade

12-B Status from UGC

COLLEGE.....

TEERTHANKER MAHAVEER UNIVERSITY

MORADABAD-244001

MONTH AND YEAR

Handwritten signature



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(Appendix-3)

Declaration: This shall be as under

DECLARATION

We, *students Name (Enrollment No.)*, are students of *Programme, Semester*, studying at *College Name, Teerthanker Mahaveer University, Moradabad (U.P.)*, hereby declare that the Project Report on "*Project Title*" submitted in Partial fulfilment of *Programme Name* is the innovative exertion showed thru us.

The evidence in addition information specified in the description is faithful to the superlative of our knowledge.

The Description of project report is not presence succumbed to any other University for award of any other Degree, Diploma and Fellowship.

Date:

Place: Moradabad

Submitted By:

Students Name (Enrolment No.)



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(Appendix-4)

Certificate: This shall be as under

CERTIFICATE

This is to certify that Project entitled “*Project Title*” has been succumbed in Partial fulfilment of the prerequisite for the degree of *Programme Name* is carried out by students, whose names are listed below under my supervision and guidance.

Submitted By:

Students Name (Enrolment No.)

Project Guide Name:

Guide Name

Date:

Project Guide Signature:



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(Appendix-5)

Acknowledgement: This shall be as under

ACKNOWLEDGEMENT

We are actual thankful to significantly recognize the abundant characters intricate in offering their support to style our plan "*Project Title*" an efficacious one.

We revenue this prospect to rapid our bottomless sagacity of appreciativeness to our moral *Principal Name* for providing that outstanding hypothetical environment in the college that ended this endeavour thinkable.

We give our wholehearted approbation and unfathomable sagacity of appreciativeness to "*HoD Name with Department & College*", TMU for his inventiveness, appreciated direction, heartening, suggestion and inclusive support overall.

We express our sincere thanks to our guide "*Guide Name (Designation)*", "*Department/College Name*", TMU, for his keen interest and invaluable help overall the project.

And also in last, we prompt our appreciativeness to all the faculties and Non-Teaching staff of "*Department/College Name*", TMU for their appropriate sustenance and ideas to complete this plan.

Date:

Students Name (Enrolment No.)



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Abstract

A portion of the project grade will be based on the abstract. The abstract will be graded according to the adherence to accepted principles of English grammar and according to the adherence to the format described below.

The abstract is an important record of the coverage of your topic and provides a valuable source of leading references for students and faculty alike. Accordingly, the abstract must serve as an introduction to your project topic. It will include the key hypotheses, the major scientific findings and a brief conclusion. **The abstract will be limited to 300 words with 5 keywords, excluding figures, tables and references.** The abstract will include references to the research articles upon which the project is based as well as research articles that have served as key background material.



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Table of Contents: This shall be as under

SAMPLE SHEET FOR TABLE OF CONTENTS

<u>TABLE OF CONTENTS</u>		
Chapter No.	Title	Page No.
	Certificate	ii
	Abstract	iii
	Acknowledgement	iv
	List of Figures	v
	List of Tables	vi
1	Introduction	I
	1.1	
	1.2	
	1.3	
2	
3	
4	References/ Bibliography	
52	Evaluation Sheets



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List of Figures and Tables: This will be as under

List of Figures and Tables - sample entries are given below:

List of Figures

Figure No.	Caption / Title	Page No.
2.1	Schematic representation of a double layered droplet	.. 21
.....		
3.2	Variation in rate versus concentration	.. 32

List of Tables - sample entries are given below:

List of Tables

Table No.	Caption / Title	Page No.
2.1	Thickness of a double layered droplet	... 22
.....		
3.2	Variation in rate versus concentration	... 34

Signature



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Bibliography/References in APA Style:

Referencing style- wherever a reference is given in the main pages it should have the following format.

The values of thermal conductivities for a variety of substances have been reported by Varma (1982). For polymers, however, the information is more limited and some recent reviews have attempted to fill the gaps (Batchelor and Shah, 1985).

For two authors - (Batchelor and Kapur, 1985)

For more than two authors - (Batchelor et al., 1986)

By the same author/combination of authors in the same year -

(Batchelor, 1978a; Batchelor, 1978b; Batchelor et al., 1978)

Bibliography/References- In the bibliography/ references list standard formats must be used. The typical formats are given below-

Journal articles: -

David, A.B., Pandit, M.M. and Sinha, B.K., 1991, "Measurement of surface viscosity by tensiometric methods", Chem. Engng Sci.47, 931-945.

Books: -

Doraiswamy, L.K. and Sharma, M.M., 1984, "Heterogeneous Reactions- Vol 1", Wiley, New York, pp 89-90.

Edited books/Compilations/Handbooks: -

Patel, A.B., 1989, "Liquid -liquid dispersions", in Dispersed Systems Handbook, Hardy, L.C. and Jameson, P.B. (Eds.), McGraw Hill, Tokyo, pp 165-178.

Lynch, A.B. (Ed.), 1972, "Technical Writing", Prentice Hall, London.

Theses/Dissertations: -

Pradhan, S.S., 1992, "Hydrodynamic and mass transfer characteristics of packed extraction columns", Ph.D. Thesis, University of Manchester, Manchester, U.K.

Citations from abstracts: -

Lee, S. and Demlow, B.X., 1985, US Patent 5,657,543, Cf C.A. 56, 845674.

Personal Communications: -

Reddy, A.R., 1993, personal communication at a private meeting on 22 October 1992 at Physics Department, Indian Institute of Technology, Delhi.



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Electronic sources (web material and the like)-

For citing web pages and electronic documents, use the APA style given at:

<http://www.apastyle.org/elecsource.htm>

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PROJECT-BASED LEARNING CONTINUOUS EVALUATION SHEET (PHASE 1): PROJECT PROPOSAL

College:

Department:

Program Name:

Semester:

Date:

Course:

Course Code:

Sr. No.	Enrollment No.	Name of Students	Topic Name	Relevance of Topic (3 Marks)	Objective(s) (2 Marks)	Tools & Technology (3 Marks)	Presentation (2 Marks)	Total (10 Marks)
1								
2								
3								
4								
5								

No of Present Students :

No of Absent Students :

Expert-1

Name:

Designation:

Signature:

Expert-2

Name:

Designation:

Signature:



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PROJECT-BASED LEARNING

CONTINUOUS EVALUATION SHEET (PHASE 2): PROJECT PROGRESS REVIEW

College:

Department:

Program Name:

Semester:

Date:

Course:

Course Code:

Sr. No.	Enrollment No.	Name of Students	Topic Name	Questionnaire/ Data Source (4 Marks)	Data Relevance (4 Marks)	Data Analysis (4 Marks)	Presentation (4 Marks)	Q/A Handling (4 Marks)	Total (20 Marks)
1									
2									
3									
4									
5									

No of Present Students :.....

No of Absent Students :.....

Expert-1

Name:

Designation:

Signature:

Expert-2

Name:

Designation:

Signature:



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PROJECT-BASED LEARNING CONTINUOUS EVALUATION SHEET (PHASE 3)

College:

Department:

Program Name:

Semester:

Date:

Course:

Course Code:

Sr. No.	Enrollment No.	Name of Students	Topic Name	Result (4 Marks)	Relevance of Result/ Outcomes (Idea/ Prototype /Working Model) (4 Marks)	Presentation (4 Marks)	Report (6 Marks)	Q/A Handling (2 Marks)	Total (20 Marks)
1									
2									
3									
4									
5									

No of Present Students :.....

No of Absent Students :.....

Expert-1

Name:
Designation:
Signature:

Expert-2

Name:
Designation:
Signature:



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PROJECT-BASED LEARNING EXTERNAL EVALUATION (Phase IV)

College:

Department:

Program Name:

Semester:

Date:

Course:

Course Code:

Sr. No.	Enrollment No.	Name of Students	Topic of PBL	Objectives (3 Marks)	Literature Review (3 Marks)	Result/ Discussion (8 Marks)	Outcome of Project (Prototype/ Model/ Algorithm) (10 Marks)	References (4 Marks)	Project Report (10 Marks)	Viva Voce (12 Marks)			Total Marks (50 Marks)
										Relevant Technical Skills (4 Marks)	Language Skills (4 Marks)	Confidence (4 Marks)	
1													
2													
3													
4													
5													

Signature
Internal Examiner
Name & Signature:

Signature
External Examiner
Name & Signature