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Minor Project — Complete Syllabus

BTEUP Diploma in Mechanical Engineering (Production) • 5th Semester • Session 2026–27

Subject 5.4 (Practical) • Total 100 Marks • 4 Credits • L 0 – P 8

About this subject: Minor Project is a fully practical subject — there is no theory paper. You work in a group of 4 to 5 students, guided by a teacher, and build a working project: 60 marks internal and 40 marks external (3-hour practical examination). **The project you select in the 5th semester will be continued in the 6th semester** as your Major Project — so choose a project you can grow, not one you can only finish.

Examination Scheme

Code	Paper	Type	L – P	Credits	Internal	External	Total
5.4	Minor Project	Practical	0 – 8	4	Practical 60	Practical 40 (3 hrs)	100
Minor Project Total				**4**	**60**	**40**	**100**

What This Subject Aims To Do

Minor projects are essential because they let students apply theoretical knowledge to real-world problems, develop critical skills like problem-solving and teamwork, gain hands-on experience with tools and technologies, encourage innovation and creativity, prepare students for their careers by demonstrating initiative and independence, and familiarise students with industry standards.

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Learning Outcomes

After undergoing this subject, the student will be able to:

- Use effectively oral, written and visual communication.
- Demonstrate skill and knowledge of current technological tools and techniques specific to the professional field of study.
- Identify, analyse and solve problems creatively through sustained critical investigation.
- Develop leadership abilities.
- Apply fundamental and disciplinary concepts and methods in ways appropriate to their areas of study.

Why Minor Projects Matter

- **Application of knowledge:** applying theoretical concepts to practical, real-world problems, reinforcing understanding.
- **Skill development:** problem-solving, critical thinking, teamwork, and project management — highly valued in the engineering industry.
- **Hands-on experience:** tools, materials, and technologies used in mechanical engineering.
- **Innovation and creativity:** thinking creatively and coming up with innovative solutions to engineering challenges.
- **Career preparation:** demonstrating initiative, independent work, and completed tasks to potential employers.
- **Industry standards:** familiarity with industry standards and practices, preparing for professional work environments.
- **Networking:** building networks with peers, faculty, and industry professionals.

Teachers may guide and help students to identify their minor project work and check out their plan of action well in advance.

Suggested List of Minor Projects (10)

- **1. Solar-Powered Water Pump:** design and build a water pump that operates using solar energy — renewable energy applications and fluid mechanics.
- **2. Automatic Pneumatic Bumper System:** a system that deploys a bumper automatically to prevent vehicle damage during collisions — pneumatics and safety systems.
- **3. Fabrication of Seed Sowing Machine:** a machine that sows seeds at specific intervals and depths — agricultural engineering with mechanical design.
- **4. Electricity Generation from Speed Breakers:** a mechanism to generate electricity when vehicles pass over speed breakers — energy conversion and mechanical design.

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- **5. Hydraulic Scissor Lift:** a scissor lift powered by hydraulics — hydraulic systems and mechanical linkages.
- **6. Solar-Powered Air Conditioning System:** an air conditioning system that runs on solar power — thermodynamics and renewable energy.
- **7. Automatic Side Stand Retrieving System for Two-Wheelers:** a system that automatically retracts the side stand of a motorcycle when the vehicle starts moving — safety mechanisms and automation.
- **8. Fabrication of a Mini Wind Turbine:** a small wind turbine to generate electricity — aerodynamics and renewable energy.
- **9. Design and Fabrication of a Go-Kart:** a small, lightweight vehicle for recreational purposes — vehicle dynamics, design, and fabrication.
- **10. Water Purification System Using Solar Energy:** a system that purifies water using solar energy — environmental engineering with mechanical design.

These projects provide hands-on experience and help in understanding various mechanical engineering concepts. As a minor project activity, each student studies the operations at site and prepares a detailed project report of the observations, processes and activities. Each teacher may guide a group of 4 to 5 students.

How Minor Project Is Marked (60 Internal Marks)

Criteria	Marks
Attendance and punctuality	10
Synopsis	25
State of the art through PPT	25
Total (internal)	**60**

The teachers, along with field supervisors/engineers, conduct the performance assessment of students. The external practical examination carries 40 marks (3 hours).

How to Prepare

Pick your project early and pick it for two semesters: the project you select in the 5th semester continues into the 6th, so choose one your group can actually build and extend. Write a tight synopsis (25 marks) and a clear state-of-the-art presentation (25 marks) — together they are 50 of the 60 internal marks. Attend every practical session: attendance and punctuality are 10 marks and your guide notices who shows up. Keep a site diary and build your detailed project report as you go, not in the last week.

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Reference Books

Reference books are not listed for this subject in the official syllabus.

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Source: BTEUP IRDT Kanpur NEP-2020 curriculum for Diploma in Mechanical Engineering (Production), effective session 2026-27, approved by the Board of Technical Education U.P. Lucknow in the C.D.C. meeting held on 16.07.2026 (urise.up.gov.in). Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.