College Code: QA

BRILLIANT INSTITUTE OF ENGINEERING & TECHNOLOGY
(Approved by AICTE, New Delhi, Affiliated to JNTU-Hyderabad)
Abdullapur(V), Abdullapurmet (M), R.R. Dt. Hyderabad - 501505
Website: www.b-iet.ac.in, e-mail: principal@b-iet.ac.in

DEPARTMENT OF CIVIL ENGINEERING

Academic Year: 2023 – 24

Course	**Hydraulics and Hydraulics Machinery**	Year / Semester	**II / II**
Topic	**Types of Turbines**	Innovative Method Chosen	**Practical Learning**

Practical Learning

Practical learning is a hands-on learning approach that helps students gain knowledge and skills by applying theoretical concepts to real-world situations. This is accomplished by performing experiments, activities, projects, demonstrations, and practical exercises. Practical learning sessions are usually designed to encourage students to actively participate, solve problems, and understand concepts through direct experience. It helps learners develop technical skills, critical thinking, creativity, and confidence by connecting classroom knowledge with actual applications.

1. Pelton Turbine:

- Pelton turbine is an impulse turbine in which the available water energy is converted into kinetic energy through a nozzle before striking the buckets.
- It is mainly used for high-head and low-discharge conditions.
- The runner consists of a number of double-cup-shaped buckets mounted around its circumference.
- It is highly efficient for high-head applications, but it is not suitable for low-head conditions.
- However, it can be inefficient for complex grammars and may lead to issues with left recursion.

2. Francis turbine:

- Francis turbine is a reaction turbine in which water enters the runner radially and leaves it in an axial direction.
- It is commonly used for medium-head and medium-discharge conditions.
- Turbine consists of a spiral casing, guide vanes, runner, and draft tube for efficient conversion of hydraulic energy.
- Francis turbines are widely used in hydroelectric power plants because of their good efficiency over a wide range of operating conditions.

3. Kaplan Turbine:

- Kaplan turbine is a reaction turbine in which water flows axially through the runner.
- It is mainly used for low-head and high-discharge conditions.
- The runner has adjustable blades, which allow the turbine to maintain high efficiency under varying load conditions.
- Kaplan turbines are commonly used in large hydroelectric power plants where a large quantity of water is available at a relatively low head

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Figure 1: Practical Learning (23QA5A0109,23QA5A0113,23QA5A0106,23QA5A0112)

Coordinator

Head of the Department

Head of the Department
Department of Civil Engineering
Brilliant Institute of Engineering & Technology
Abdullapur (V), R.R. Dist., Hyderabad-501505.

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DEPARTMENT OF CIVIL ENGINEERING

Date: 15-05-2024

To
The Principal,
Brilliant Institute of Engineering and Technology,
Abdullapur (V & M) - 501505,
R. R. District, Hyderabad.

Respected Sir,

Sub: Seeking Permission – Innovative TLP (Practical Learning) – Reg.

We are hereby bringing to your kind notice that the Department of Civil Engineering is going to conduct an Innovative Teaching Learning Practice (TLP) session on "Practical Learning – Types of Turbines" for the students of II Year II Semester as a part of the Hydraulics and Hydraulic Machines (HHM) subject.

The session aims to provide students with practical knowledge of different types of turbines, their working principles, components, classifications, and engineering applications. Through demonstrations, discussions, and practical learning activities, students will gain a better understanding of turbine operation and their role in hydroelectric power generation systems. This activity will help bridge the gap between theoretical concepts and real-world engineering practices.

We have scheduled the program on 29-05-2024 between 1:15 PM and 3:45 PM for the students of II Year II Semester. This program will serve as an effective platform for knowledge sharing and skill enhancement among students.

In this regard, we request you to kindly permit us to conduct the program for the benefit of the students.

Thanking you, Sir.

Yours Sincerely,

Head of the Department

Head of the Department
Department of Civil Engineering
Brilliant Institute of Engineering & Technology
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DEPARTMENT OF CIVIL ENGINEERING

Date: 25-05-2024

Circular

This is to inform all faculty members and students of the Department of Civil Engineering that the department is going to conduct an Innovative Teaching Learning Practice (Practical Learning) session on "Types of Turbines" under the subject Hydraulics and Hydraulic Machines (HHM) on 29-05-2024 between 1:15 PM and 3:45 PM.

The session is intended to provide practical knowledge on the classification, working principles, components, and applications of various types of turbines used in hydraulic engineering and hydroelectric power generation. This program will serve as an effective knowledge-sharing platform and help students strengthen their understanding of the subject through practical learning.

Hence, all the students of II Year II Semester who are interested in participating are directed to enroll their names with the concerned faculty on or before 28-05-2024.

Head of the Department

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Copy to:

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DEPARTMENT OF CIVIL ENGINEERING

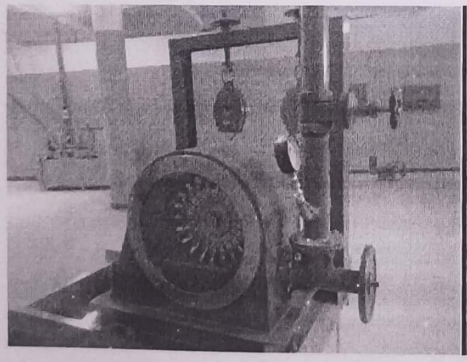
Practical Learning – Types of Turbines

A Practical Learning class is a teaching session where students learn concepts through observation, demonstrations, hands-on activities, and real-world applications. It helps students understand theoretical concepts by connecting them with practical engineering systems and equipment.

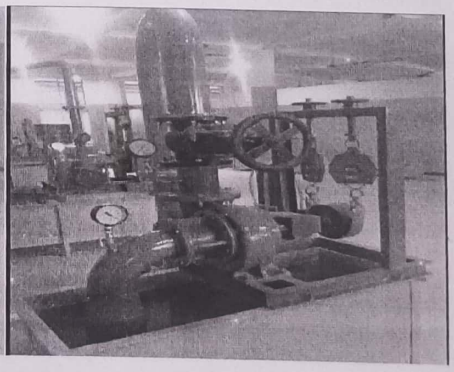
A Practical Learning session on "Types of Turbines" in the Hydraulics and Hydraulic Machines (HHM) subject enables students to study different turbines used in hydroelectric power generation, their working principles, classifications, components, and applications. Students actively participate by observing turbine models, identifying their parts, comparing different turbine types, and discussing their suitability under various operating conditions.

What Happens in a Practical Learning Class?

1. The faculty introduces the topic **"Types of Turbines"** and explains its importance in hydraulic engineering.
2. Students observe turbine models, charts, videos, or laboratory equipment related to Pelton, Francis, and Kaplan turbines.
3. The working principles, construction details, and applications of different turbines are demonstrated and discussed.
4. Students compare turbine performance under different head and discharge conditions and participate in interactive discussions.
5. Students gain practical knowledge and develop a better understanding of turbine selection and operation in hydroelectric power plants.



PELTON TURBINE



KAPLAN TURBINE

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FRANCIS TURBINE



Figure 1 : (23QA5A0109,23QA5A0113,23QA5A0106,23QA5A0112)

Purpose

6. Enhances practical understanding of turbine operation and applications.
7. Bridges the gap between theory and real-world engineering practices.
8. Develops analytical and problem-solving skills.
9. Encourages active participation and technical discussions.
10. Improves teamwork, communication skills, and confidence.
11. Strengthens students' understanding of Hydraulics and Hydraulic Machines concept

Coordinator

Head of the Department

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DEPARTMENT OF CIVIL ENGINEERING

Summary Report
On
Practical Learning

The Department of Civil Engineering conducted a Practical Learning Session on the topic "Types of Turbines". The main objective of this activity was to provide students with practical knowledge about different types of turbines used in hydraulic and power generation systems. The session helped students understand the working principles, construction, applications, and performance characteristics of various turbines such as Pelton, Francis, and Kaplan turbines.

The practical learning activity was organized for Civil Engineering students and mapped to Program Outcome (PO1, PO2, PO3, PO5.)A large number of students actively participated in the session. On this occasion, **Dr. Shaik Rusthum, Principal**, motivated the students to participate in such technical activities and congratulated the organizing committee. He also advised the faculty members to conduct more practical-oriented learning programs to enhance students' technical competence and industry readiness.

The total number of students who participated in the event was 24.

Merit Students

S.No	Roll Number	Name of the Student
1	23QA5A0109	K. Anusha
2	23QA5A0113	R. Venkat raj
3	23QA5A0106	G. Shiva
4	23QA5A0112	P. Pranay

Coordinator

Head of the Department

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