



MARRI LAXMAN REDDY **INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

DEPARTMENT OF CIVIL ENGINEERING

2050174 – FLUID MECHANICS AND HYDRAULIC MACHINERY LABORATORY

VISION

- The Civil Engineering department strives to impart quality education by extracting the innovative skills of students and to face the challenges in latest technological advancements and to serve the society.

MISSION

- To fulfill the promised vision through the following strategic characteristics and aspirations: Provide quality education and to motivate students towards professionalism.
- Address the advanced technologies in research and industrial issues

PROGRAM EDUCATIONAL OBJECTIVES

PEO – I: Solving civil engineering problems in different circumstances.

PEO – II: Pursue higher education and research for professional development.

PEO – III: Inculcate qualities of leadership for technology innovation and entrepreneurship.

PROGRAM SPECIFIC OUTCOMES

PSO 1 – UNDERSTANDING: Graduates will have ability to describe, analyse and solve problems using mathematical, scientific, and engineering knowledge.

PSO 2 - ANALYTICAL SKILLS: Graduates will have an ability to plan, execute, maintain, manage, and rehabilitate civil engineering systems and processes.

PSO 3 - EXECUTIVE SKILLS: Graduates will have an ability to interact and work effectively in multi disciplinary teams.



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PROGRAMME OUTCOMES

PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



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B.Tech. III Year - I Sem

L/T/P/C

0/0/3/1.5

COURSE OUTCOMES

1. Understand calibration of flow measuring devices.
2. Apply the practical aspects of Bernoulli's principle
3. Evaluate the losses in pipe flows.
4. Analyse the Manning's and Chezy's constants for Open channel flow
5. Analyse the characteristics of turbine
6. Analyse the characteristics of pumps

LIST OF EXPERIMENTS

1. Verification of Bernoulli's equation
2. Determination of Coefficient of discharge for a small orifice by a constant head method
3. Calibration of Venturimeter / Orifice Meter
4. Calibration of Triangular / Rectangular/Trapezoidal Notch
5. Determination of Minor losses in pipe flow
6. Determination of Friction factor of a pipe line
7. Determination of Energy loss in Hydraulic jump
8. Determination of Manning's and Chezy's constants for Open channel flow.
9. Impact of jet on vanes
10. Performance Characteristics of Pelton wheel turbine
11. Performance Characteristics of Francis turbine
12. Performance characteristics of Kaplan Turbine
13. Performance Characteristics of a single stage / multi stage Centrifugal Pump



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LIST OF EQUIPMENTS

- Bernoulli's Apparatus
- Orifice
- Venturi & Orifice Meter
- Rectangular & Triangular Notch
- Minor loss Apparatus
- Friction factor in Pipe line
- Hydraulic Jump Apparatus
- Chezy's & Mannings Test Rig
- Impact Jet of Vanes
- Pelton Wheel Turbine (1 KW)
- Francis Turbine
- Kaplan Turbine
- Single stage Centrifugal Pump
- Multistage Centrifugal Pump



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DO's

1. Be on time, at the start of the lab period, there will be a short introduction to the experiment you will perform that day.
2. Thoroughly clean your laboratory work space at the end of the laboratory session.
3. Maintain silence and clean environment in the lab and put bags at allocated Locations.
4. Switch on/off the instruments, with the support of lab technicians.
5. Take the reading properly, and use the stop watch carefully.

DONT'S

1. Do not try to run and operate any machine without permission and knowledge of the lab Personnel
2. In case of any mishap - Do not panic, be calm and do report at lab handling faculty.
3. Don't touch the water inside the equipment case, and also the components of equipments.