

Department of Civil Engineering

Innovative Teaching and Learning Process

1) Project-Based Learning:

Project-based learning involves students in real-world projects that require them to apply their knowledge and skills to solve practical problems. This approach allows students to apply their interest in developing problem-solving skills.

The students have been motivated to do projects related to real-world problems and in this line the students of civil engineering department have done the following projects. These projects have been financially supported and assessed by Karnataka State Council for Science and Technology, Bangalore

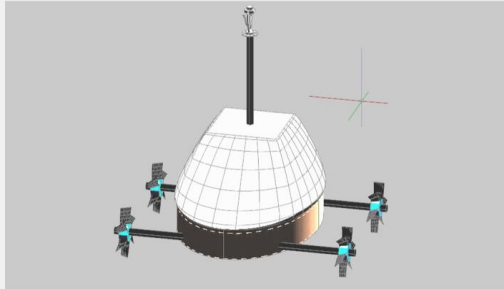
Encourage students to work on real-world projects that simulate the challenges they may face in their future careers.

a) Removal of Froth in Lakes Using a Probe

INTRODUCTION:

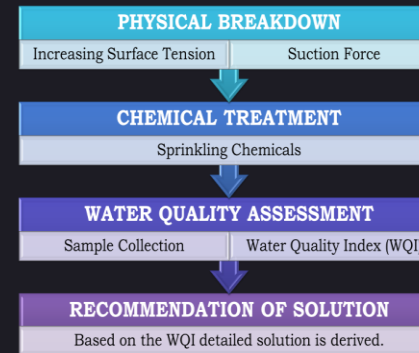
- The DE-FROTHING OF LAKE is a complex and dynamic process, because it cannot be done by a one-point process or ideology as this involves many inter-related parameters like Climate, Temperature, Storm water/Industrial Effluent characteristics, Drainage pattern, Topological features and many other characteristics which as a whole has to be assessed in detail for deriving a permanent and fruitful solution.
- By considering all the above points, a best possible solution has been designed and concluded in the form of a probe. This PROBE by name itself characterizes as something which explores the unknown. Here the unknown is termed to as Water Quality.
- The probe not only captures the physical properties of the lake's water but also de-froths the surface of the lake using its built-in features.
- All the features included in the probe are explained in the coming slides.

REMOVAL OF FROTH IN LAKES USING A PROBE



01

FLOWCHART OF METHODOLOGY



05

STAGES OF CONSTRUCTION



Fig 12: Initial carpentry and frame works



Fig 13: Painting works



Fig 14: Buoyancy Test



Fig 16: First Test Run



Fig 15: Assemble of Electronic Components and programming

15

OUTCOMES:

- Probe proves to be a convenient method to break the foam in the lakes and drains remotely from a range of 2km.
- This can be built using reusable materials.
- Maintenance is negligible and easy.
- This can also be used to collect the data of the same remotely.
- The probe not only functions as a defoaming machine but also can be used in future for collecting data from any place of the world too.
- This builds a human less environment for tackling the problems using the present-day technologies.
- This increases the transparency in the management of the lake under PPP models.

PO MAPPING:

The above project-based learning will be helpful to fill the gap with respect to PO6: (Engineer and Society)

b) Study on Smart Irrigation System

INTRODUCTION:

- Agriculture is one of fields where water is required in tremendous quantity. Wastage of water is the major problem in agriculture.
- There are many techniques to save or to control wastage of water in agriculture the main objective of the system is to -
- Conserve Energy & Water.
- Resources Handles the System Manually and Automatically.
- Detects the Level of Water.
- Irrigation is mostly done using canal systems in which water is pumped into fields after regular interval of time without any feedback of water level in field

OBJECTIVES:

- Collection of data on existing smart irrigation system through field study.
- Evaluation of water management system in the smart irrigation practices in the study area.
- Analysis of field data collected.
- Government supports through central and state schemes to the farming community in the study area.

- **Drip irrigation** is the most used type of irrigation system. Drip irrigation is a controlled, slow application of water to soil over a long period of time. The water flows under low pressure through plastic pipe/tubing laid along each row of plants. It reduces water loss by up to 90 percent.



- **Sprinkler irrigation**, water is sprayed into the air and allowed to fall on the ground surface somewhat resembling rainfall. The spray is developed by the flow of water under pressure through small orifices or nozzles. The pressure is usually obtained by pumping. The trials conducted in different parts of the country revealed water saving due to sprinkler system varies from 16 to 70 % over the traditional method with yield increase from 3 to 57 % in different crops and agro-climatic conditions.



OUTCOMES:

- In the study area the sprinkler irrigation and drip irrigation system is already in practice as there is a conservation for water done using these modern techniques of irrigation systems.

- This irrigation system allows cultivation in places with water scarcity thereby improving sustainability.
- Central and State Governments are helping farmers through various schemes like Rastriya Krishi Vikas Yojana, Pradhan Mantri Krishi Sinchayi Yojana, National Food Security Mission (Central Schemes) Mukhya Mantrigala Hani Niravari Yojane, Krishi Bhagya (State Schemes) by providing them subsidies.
- Due to increase in population, irrigation like drip and sprinkler will overcome the scarcity of water and increase the crop yield.
- Known about the differences between traditional and conventional methods of irrigation.

PO MAPPING:

- The above project-based learning will be helpful to fill the gap with respect to **PO6: (Engineer and Society)**

c) For subjects like Alternate Building Materials and Renewable Energy Resources the same concept of Project based learning has been practiced.

2) Flipped Classroom:

Flip the traditional classroom model by providing students with pre-recorded lectures or online materials to study at their own pace before coming to class. Classroom time can then be utilized for discussions, problem-solving sessions, and engaging activities that foster deeper understanding and application of concepts.

Flipped classroom teaching can be implemented in various ways, depending on the teacher's goals and the subject matter. Some teachers use pre-recorded videos or podcasts to deliver lectures, while others assign readings or interactive online modules.

The students have been shared the video lecture of some subjects like Analysis of Determinate Structures, Elements of Civil Engineering, Environmental Studies etc. Earlier these lectures have been shared in Edmodo platform and now we are sharing in our website and planned to share these types of lectures in the GNCMS platform.

Name of the Faculty	Designation	Subject	Video Link
Ms. Anitha J	Assistant professor	Analysis of Determinate Structures	https://drive.google.com/drive/folders/18DqKlaoLwyP9oNgxZTCPJadelAZwxJLa?usp=sharing https://drive.google.com/drive/folders/13HjaUDhuWoAeec5AMGyXD2_yIECMQZlw?usp=sharing
Ms N Tamil Selvi	Assistant professor	<ul style="list-style-type: none">• Elements of Civil Engineering• Construction Management and Entrepreneurship	https://youtube.com/@GRACE-uu9hf https://www.youtube.com/playlist?list=PL94La6YFCm2E_2ECxzhnDGf-SMFDCIV1G

3) Industry Engagement:

Foster partnerships and collaborations with industry professionals and organizations. Inviting guest speakers, organizing site visits, or facilitating internships can provide students with practical insights into the civil engineering industry, expose them to real-world challenges, and bridge the gap between academia and industry.

VISIT TO CONSTRUCTION SITE:

Site Visit: Anthem Bio Science, Harohalli Industrial Area, Bangalore

Visit Date: 09-January-2023

Faculty namely Associate Professor Dr. Shivanna S, Assistant Professor Pradeepa.S , Tamil Selvi N along with 5th Sem Civil Engineering Students.

Objective of Visit: Technical exposure of Construction.



OUTCOMES:

- Students will be able to apply the knowledge on the quality, safety and human values for the effective construction Management process.
- Students will be able to apply the concept entrepreneurship and its role in infra-structural development