



Department of Civil Engineering

Course Name: Strength Of Materials (AY 2023-24, II-I)

Instructor Name: Dr. Saduwale Shrihari

Approach: ICT Based Learning

Topic: Unit 3- Concept of Shear Force and Bending Moment in Beams

CO: 4

PO's: PO1, PO2, PO3, PO11, PO12

Goal: To demonstrate concept of Shear Force and Bending Moment in Simply Supported Beams.

Concept: Shear Force: Shear force at any section is the summation of all transverse forces, either to the left or right side of the section. Due to the effect of shear force, the cross-section of the body is deformed, and shear strain will be induced. The shear force also induces shearing stresses in the body. Further, we have provided the important details related to shear force in the upcoming sections. Bending Moment: Bending moment at any cross section of the member is equal to algebraic sum of bending couples and moments either on left hand side of section or on the right-hand side of the section.

Classroom Activity: Using ppt presentations and providing interactive teaching learning impact students in learning the basic concepts in the most important subjects like strength of materials. Students are explained the types of beams and types of loading conditions and how the beam behaves during any load is applied on it.

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Department of Civil Engineering

Course Name: Fluid Mechanics

Instructor Name: K Roja

Approach: Demonstration Based Learning

Topic: Unit 3: Bernoulli's Theorem

CO: 3

PO's: PO1, PO2, PO3, PO4, PO6, PO7, PO12

Goal: To demonstrate concept of deflection of simply supported beam when load is acting at centre.

Concept: Bernoulli's Principle states that when an incompressible and non-viscous liquid (or gas) flows in stream-lined motion from one place to another, then at every point of its path the total energy per unit volume (pressure energy + kinetic energy + potential energy) is constant. That is

$$\frac{p}{\rho g} + \frac{v^2}{2g} + z = \text{constant}$$



Classroom activity: To demonstrate the Bernoulli's theorem, a series of manometers tapped into the main tube from inlet to outlet and stop watch is required in this set up. Diameter and cross-section area are not constant in the main tube. After releasing fluid through inlet, the level in the manometers is not same, starting it decreases to centre and from centre it is increasing to end, it represents the pressure head and a hypodermic probe that can be traversed along the centre of test section to measure the total head. For a required time collect the water, through this discharge can be calculated, take the dimensions of the collected tank from discharge velocity also calculated.


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Department of Civil Engineering

Course Name: Design of Reinforced Concrete Structures

Instructor Name: V. Swathi

Approach: Field Visit

Topic: Unit III: Design of Slabs: Field Visit

CO: 3

PO's: PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO12

Goal: To give awareness to the students about the design procedure of slabs which are placed at site.

Concept:

There are varieties of teaching and learning process adopted in civil engineering through which Students can understand the subject thoroughly with an easier manner. For the subject Design of Reinforced Concrete Structures field visit has been adopted which aims to understand the technical concepts of field work. It helps bridge the gap between education and hands – on experience.

The main purpose of visit is to give clear idea of reinforcement in slabs in building construction.

RCC slab is a structural component. The RCC slabs are supported on the columns and beams. RCC Slabs whose thickness ranges from 10 to 50 centimetres are most often used for the construction of floors and ceilings.


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Department of Civil Engineering

Course Name: Geotechnical Engineering

Instructor Name: Dr. Sai Baba Reddy

Approach: Demonstration Based Learning

Topic: Unit I: Index Properties of the soil

CO:1

PO's:PO1, PO2, PO6, PO7, PO12

Goal: To demonstrate concept of the different index Properties of the soil like grain size distribution, Field density, specific Gravity, Consistency Limits

Accessories required: Sieve shaker, sieve sizes, soil, Pycnometer, Casagrande apparatus, core cutter

Concept: Basically, Properties of the soil used for identification and classification are termed as Index Properties of the soil

Soil index properties refer to the properties of the soil that help to classify and identify the properties of soil for purposes of engineering. For example, clay is generally cohesive in nature and sand and gravel are described as granular and non-cohesive. Cohesive soil is also known as plastic soil, and non-cohesive soil is also known as non-plastic soil.

Classroom activity: To demonstrate the Index Properties of the soil, Each and every property is explained Clearly through demonstration-based learning by showing the apparatus required for each property like Specific gravity, water content, core cutter, Casagrande apparatus, particle size distribution, relative density. Each equipment is shown through the step wise procedure. The students analysed the Identification and Different classifications of soils.



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Department of Civil Engineering

Course Name: Hydraulics & Hydraulic Machinery

Instructor Name: Mrs. Dhanasure Pooja

Approach: Demonstration Based Learning

Topic: Unit IV: Turbines: Performance of Pelton Turbine

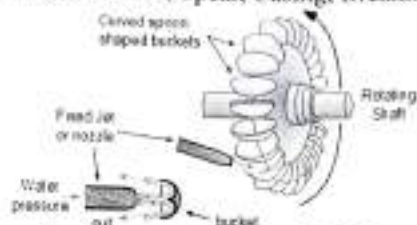
Co: 4

PO's: PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO10

Goal: To study the constructional details and performance parameters of Pelton Turbine.

Concept: To understand the working principle of turbine in the Hydraulic structures.

Components: Runner with bucket, Nozzle, Spear, Casing, Breaking jet, etc.



Components of Pelton Turbine

Governing mechanism: The speed of turbine runner is required to be maintained constant so that electric generator can be coupled directly to turbine. Therefore, a device called governor is used to measure and regulate the speed of turbine runner.

Power, Efficiency and Specific Speed Expressions:

From Newton's second law applied to angular motion,

$$\text{Angular momentum} = (\text{Mass})(\text{Tangential velocity})(\text{Radius})$$

$$\text{Torque} = \text{Rate of change of angular momentum}$$

$$\text{Power} = (\text{Torque})(\text{Angular velocity})$$

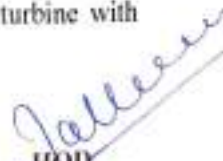
Considering the water jet striking the runner generates a torque of and rotates the runner with (rev/m), and then power obtained from the runner can be expressed as:

$$P_{out} = T\omega [W]$$

$$P_{in} = \rho g Q H$$

Classroom activity: To demonstrate the Performance of the Pelton wheel for students. We explained the performance of the Pelton wheel which is an example of impulse turbine in which vanes sometimes called buckets, of elliptical shape are attached to the periphery of a rotating wheel, as shown in above Fig. One or two nozzles project a jet of water tangentially to the vane pitch circle. The vanes are of double-outlet section, so that the jet is split and leaves symmetrically on both sides of the vane. This type of turbine is used for high head and low flow rates. It is named after the American engineer Lester Pelton. Finally, students were able to calculate the efficiency and specific speed of turbine with appropriate equations.


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Department of Civil Engineering

Course Name: RAHE

Instructor Name: Mr. E Giriprasad Goud

Approach: Field visit

Topic: Unit II: Components of Railways

CO: 3

PO's: PO1, PO2, PO6, PO7, PO10

Goal: To make students understand in practical view.

Concept: Students visited the railway track, turnouts, signal room and service center. In this visit students came to know how the train is going to change the track that is turnouts, points and crossings. Students also learnt about the parts of turnouts like wing rails, check rails, lead rails, theoretical nose, actual nose, stretcher bars, fish bolts, fish plates, sleepers and control system of these rails.

Field activity: Signaling trains is also an important parameter to avoid accidents. Students observed signals like maintaining proper precautions, controlling methods, how to give signal, when to give signal and how the GPS system is used in very efficient way. The visit made students to understand in practical way and gain the knowledge.



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Department of Civil Engineering

Course Name: Concrete Technology

Instructor Name: Mr. Vithal Biradar

Approach: Industrial Visit

Topic: Unit IV: Ready Mix Concrete (Batching, Mixing, Transportation)

CO:4

PO's: PO1, PO2, PO3 PO6, PO7, PO12

Goal: To demonstrate concept of Ready-mix concretes Batching, Mixing, Transportation of RMC

Concept: Ready-mix concrete (RMC) is concrete that is manufactured in a batch plant, according to each specific job requirement, then delivered to the job site "ready to use"

Industrial Visit: As a more understanding of topic Ready mix concrete student were made to visit RMC Plant Ready in by this field visit understood more about Ready Mix Concrete some are

It is a ready-to-use material which is a mixture of Cement, Sand, Aggregate and Water. RMC is a type of Concrete which is mixed in a batching plant according to the specification of the customer and delivered to the site by the use of transit mixer as it is away from the construction site.

they understood that in large or medium scale project it is cheaper as it requires less time, less manpower and high strength as compared to Site mix concrete. So, ultimately it is time saving and cheaper. RMC is also eco-friendly as it reduces the noise and air pollution because mixing is done in closed chamber a s compares to site mix concrete.



Student visit to RMC Plant at Bachupally

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Department of Civil Engineering

Course Name: Foundation Engineering (A46119)

Instructor Name: Mrs. Sarada

Approach: Field Visit

Topic: Unit 3: detailing of foundations Beds

PO's: PO1, PO2, PO6, PO7, PO12

Goal: The main objective of this site visit is to make the students understand about the soil investigation and laying of foundation to explore and identify different types of foundations.

Concept: In foundation Engineering course there is a concept known as types of foundation and evaluating the safe bearing capacities of different types of soil strata. Depending upon the type of Soil different exploration methods will be adopted and by performing index properties and engineering properties which includes (C and Φ parameters) type of foundations will be laid.

Field Visit: To make students to understand about the field conditions of soil and variation in depth of foundation a field visit at VJIT new hostel block which is located at back side of D block has been arranged for III-year II semester students. Here students have been explained regarding depth of foundation and differences in depths of foundations. Students have observed differences in depth of foundation beds due to hard and soft soil strata. This site visit helped students correlate the lectures with the procedural knowledge gained at the site. Students observed the laying of CC beds in different elevations in the foundation due to variations in soil strata corresponding to its bearing capacities. Finally, this site visit helped students for better understanding about the types foundation, Shape of the footings reinforcement details and planning execution the structure.



Students visited VJIT new hostel block construction Site

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Department of Civil Engineering

Course Name: Water Resources Engineering

Instructor Name: Mrs. K. Harika

Approach: ICT based learning

Topic : Unit IV: Types of Irrigation:

CO:4

PO's: PO1, PO6, PO7, PO9, PO12.

Goal: To demonstrate concept of Types of irrigation and like flow irrigation, lift irrigation and some methods of irrigation.

Concept: Basically, Irrigation has two main types like flow Irrigation and lift irrigation.

In flow irrigation is the type of flow of water through gravity and lift irrigation is the process of lifting water from lower level to higher level with the helps of pumps and other equipment. In flow irrigation there are different methods were there to supply water to field. Like surface irrigation, subsurface irrigation, sprinkler and drip irrigation. Advantages and disadvantages were there for this methods. For example, irrigation method used for rice in India is basin irrigation but drip irrigation is the best method to use for rice crop, the main drawback is the instalment cost is high.

Classroom activity: To demonstrate the types of irrigation, each and every type and methods are explained clearly through ICT based learning by showing the different images of irrigation like border irrigation, check irrigation, basin irrigation, sprinkler irrigation and drip irrigation and explained clearly about which type of irrigation can be used for which type of crop. Few lift irrigation projects images were shown in presentation and explained about the topic clearly. The students interested to get to now more types and methods of irrigation.


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Department of Civil Engineering

Course Name: Solid Mechanics -I

Instructor Name: Dr. N Sudharsan

Approach: Demonstration Based Learning

Topic: Unit 5: Deflection of Simply Supported Beam

CO: 5

PO's: PO1, PO2, PO3, PO4, PO6, PO7, PO12

Goal: To demonstrate concept of deflection of simply supported beam when load is acting at centre.

Concept: Deflection, in structural engineering terms, means the movement of a beam or node from its original position. It happens due to the forces and loads being applied to the body. Deflection also referred to as displacement, which can occur from externally applied loads or from the weight of the body structure itself.

$$\frac{wl^3}{48EI}$$

Classroom activity: To demonstrate the Deflection of Simply Supported Beam when point load is acting at centre it gets maximum deflection. Simply supported beam setup, weights and dial gauge is required to perform the test. The beam was kept on two supports, hanger and dial gauge at centre. The initial value of deflection with hanger hanging on the beam was measured. 100g of load was applied in the hanger and the value on gauge was noted. The difference of first value and this value was deflection. An increment of 100g was applied and the value of deflection was noted for each load.

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Department of Civil Engineering

Course Name: Engineering Geology

Instructor Name: Mr. Anand Sheelvanth

Approach: Demonstration Based Learning

Topic: Unit II: Mineralogy & Petrological Studies through Microscopic Analysis

CO:2

PO's: PO1, PO2, PO6, PO7, PO12

Goal: In civil engineering, material selection is a critical factor that directly impacts the structural integrity and performance of a project.

By leveraging mineralogy, engineers gain insights into the physical and chemical properties of various minerals, allowing them to choose materials that possess the desired characteristics for a specific application.

For instance, when designing a bridge that needs to withstand heavy loads, engineers can analyze the properties of different construction materials, such as aggregates, cements, and reinforcements, through mineralogy.

This analysis helps them identify the most suitable materials that offer exceptional strength, durability, and resistance to environmental factors. Despite the significance of geological materials in civil engineering projects, the field of engineering geology has by tradition been concerned more with relations between the engineering structure and its geological environment than with the performance of rock aggregates in the structure itself. This inequality is being documented and attuned in the fields of teaching, practice and research.

Classroom Activity: In class room, we took a special object of rock and minerals, through that we considered and observed that each mineral & rock has texture of alumina layers end to end of the structure, hence Mineralogy and petrology are two important fields of study in civil engineering. Mineralogy is the scientific study of minerals and their properties, while petrology is the study of rocks and their properties.

In civil engineering, mineralogy and petrology are used to evaluate the quality of construction materials, optimize the design and construction processes, and enhance the performance and durability of infrastructure projects.

Mineralogy helps civil engineers to analyze the physical and chemical properties of minerals, which is crucial for material selection. By understanding the properties of minerals, engineers can choose materials that possess the desired characteristics for a specific application. For instance, when designing a bridge that needs to withstand heavy loads, engineers can analyze the properties of different construction materials, such as aggregates, cements, and reinforcements, through mineralogy. This analysis helps them identify the most suitable materials that offer exceptional strength, durability, and resistance to environmental factors.

Petrology, on the other hand, provides insights into the load-bearing properties of rocks, which is essential for deciding their usage in construction projects. By studying the hardness, chemical composition, strength, and durability of rocks, petrology helps civil engineers to make informed decisions regarding the selection of rocks for construction purposes. In summary, mineralogy and petrology play a crucial role in civil engineering by enabling engineers to make informed decisions regarding material selection, design, and construction processes. By harnessing the knowledge of mineral and

rock properties, civil engineers optimize the performance and longevity of infrastructure projects.



As above images shows that class room representations of minerals & rocks identification through electronic ultra microscope


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Department of Civil Engineering

Course Name: Surveying and Geomatics

Instructor Name: Ms. Ms. Abhigna

Approach: Demonstration Based Learning

Topic: Unit I: Surveying: Demonstration of horizontal angles by repetitive method(Horizontal Angles using theodolite)

CO:1

PO's:PO1, PO3, PO4, PO6, PO7, PO12

Goal: To determine a horizontal angle by the method of repetition.

Accessories required: Transit Theodolite, Tripod, Plumb Bob, Ranging Rods and Pegs.

Concept: In the method of repetition, the angle is measured and added to itself several times and divided by the number of times it is added. It is then possible to obtain the value of angle to a greater degree of accuracy than the least count of the vernier. The error due to imperfect graduations is also minimized. The method of repetition is used to measure a horizontal angle to a finer degree of accuracy than that obtainable with the least count of the vernier. By this method an angle is measured two (or) more times by allowing the vernier to remain clamped each time at the end of each measurement instead of setting it back at zero when sighting at the previous station. Thus, an angle reading is mechanically added several times depending upon the number of repetitions. The average horizontal angle is then obtained by dividing the final reading by number of repetitions. Generally, six repetitions are done three with the telescope normal and three with the telescope inverted.

Classroom & Field activity: The activity was performed in classroom by students forming groups. The angles were taken in the class by considering two corners 'A' & 'B' of the wall by placing the ranging rods and placing the theodolite at centre as point 'C' of class projecting to the corners. This approach involves manually adding the horizontal angle several times. The correct angle value is subsequently determined by dividing the total reading by the number of repetitions taking. The repetition method is an effective technique for increasing the accuracy of horizontal angle measurements using a theodolite.



Demonstrating the students and showing them how theodolite works


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Department of Civil Engineering

Course Name: Geotechnical Engineering

Instructor Name: Mrs. Deepika

Approach: Demonstration Based Learning

Topic: Unit 5: Engineering Property of soil: Demonstration of Direct shear test box


Goal: To demonstrate concept of shear strength of soil for the cohesionless soil

Accessories required: shear box, soil, tray, dial gauges

Concept: Direct shear test is to measure the shear strength properties of soil the test is performed on three or four specimens from a relatively undisturbed soil sample. A specimen is placed in a shear box which has two stacked rings to hold the sample, the contact between the two rings is at approximately the mid-height of the sample. A confining stress is applied vertically to the specimen, and the upper ring is pulled laterally until the sample fails, or through a specified strain. The load applied and the strain induced is recorded at frequent intervals to determine a stress strain curve for each confining stress. Several specimens are tested at varying confining stresses to determine the shear strength parameters, the soil cohesion (c) and the angle of internal friction, commonly known as friction angle. The results of the tests on each specimen are plotted on a graph with the peak or residual stress on the y-axis and the confining stress on the x-axis. The y-intercept of the curve which fits the test results is the cohesion, and the slope of the line or curve is the friction angle.

Classroom activity: To demonstrate the shear strength of the soil. Check the inner dimension of the soil container Setup the box with the base plate grid plate and foot screws calculate the volume of the container. Weigh the container. Place the soil in smooth layers (approximately 10 mm thick). Later soil has been taken and poured into the direct shear box. If a dense sample is desired tamp the soil. Weigh the soil container, the difference of these two is the weight of the soil. Calculate the density of the soil. Make the surface of the soil plane. Put the upper grating on stone and loading block on top of soil. Measure the thickness of soil specimen. By applying the desired normal load. Remove the shear pin. Attach the dial gauge which measures the change of volume. Record the initial reading of the dial gauge and calibration values. Before proceeding to test check all adjustments to see that there is no connection between two parts except sand/soil. Take the reading of the shear force and record the reading. Take volume change readings till failure. Add 5 kg normal stress 0.5 kg/cm^2 and continue the experiment till failure




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Department of Civil Engineering

Course Name: AIR POLLUTION AND CONTROL METHODS

Instructor Name: V. Nikhila Bhavani

Approach: Visualization based learning

Topic: Unit 1 – Episodes of Air Pollution

CO: 1

PO's: PO1, PO2

Goal: To demonstrate concept of Episodes of Air Pollution

Concept: An air pollution episode is the term used for a period of poor air quality, usually lasting up to several days, extending over a large geographical area.

Classroom activity: A Video lecture has been demonstrated on BHOPAL GAS TRAGEDY occurred on Dec 2-3, 1984 where during this disaster a toxic gas named Methyl Isoocyanate (MIC) was released due to explosion of storage tank in which MIC is stored and killed around 3787 people. By this video the students are able to learn the concept of episodes of air pollution and how the gas affected the people, animal of Bhopal within 1 hour period of time.



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Department of Civil Engineering

Course Name: Estimating and Costing

Instructor Name: G Ratnakar Goud

Approach: Field visit

Topic: Arrangement of Reinforcement in Beams, Slabs, Columns

CO:3

PO's: PO1, PO2, PO4, PO6, PO7

There are varieties of teaching and learning process adopted in civil engineering through which students can understand the subject thoroughly with an easier manner. For the subject Design of Reinforced Concrete Structures field visit has been adopted which aims to understand the technical concepts of field work. It helps bridge the gap between education and hands – on experience. Some of the examples are given below.

Topic: Arrangement of Reinforcement in Beams, Slabs, Columns (Subject Covered)

Photos demonstrate reinforcement bars arrangement. The main purpose of visit is to give clear idea of number of bars to be used, its size and its spacing in building construction and students are interacting with engineers. In RCC schedule, the bars are arrangement for each structural units (beams or columns or slabs or footings etc) and detailed list is prepared which specifies the bar location, bar size, cranked length, type of bend and shape of the bar in reinforcement drawings.



Field visit on the topic Arrangement of Steel bars


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Department of Civil Engineering

Course Name: Green Building Technologies

Instructor Name: Mrs. Navodaya

Approach: Industrial Visit

Topic: Unit I, II, III

CO:1,2,3

PO's:PO1, PO2, PO3 PO6, PO7, PO12


Goal: To demonstrate Principle and working of Green Building

Concept: A green building is an environmentally sustainable structure, which makes efficient use of land, materials, energy, and water while costing less in terms of maintenance charges. A green building enhances energy efficiency, limits water consumption, and makes maximum use of recycled and locally available, recyclable, and non-toxic materials.

Industrial Visit: For more understanding of Green Building Principle, Working, Design aspects students visited to Green Building Centre at Kondapur, Hyderabad with this student were able to understand with various aspects like 1. Sustainable Site Design 2. Water Quality & Conservation 3. Energy & Environment 4. Indoor Environmental Quality 5. Material use



Student visit to Green Building Centre, CII Hyderabad Kondapur


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Department of Civil Engineering

Course Name: BUILDING MATERIALS AND CONSTRUCTION

Instructor Name: Thirumala Sujatha

Approach: Demonstration Based Learning:

Topic: Unit 2-Cement and Admixtures

CO: 2

PO's: PO1, PO2, PO4, PO7

Goal: Tests on cement are important parameters that indicate the workability and strength development of the concrete.

Concept: Tests on Cement: Consistency of Cement and Initial setting time of Cement

Consistency affects how well the concrete binds, influencing its overall strength, durability, and performance. Proper consistency helps ensure your freshly mixed concrete will lead to a structure that can withstand the test of time. The cement's initial setting time indicates when the cement paste starts to lose its plasticity. For instance, if the initial setting time of cement is 30 minutes, the cement mortar or concrete must be placed in the desired position within 30 minutes of adding water.

Classroom activity: Experiment Conducted on Consistency of cement and initial setting time of cement.

In this approach, Concrete and highway laboratory is chosen for conducting experiment. The students were given time to do experiment and the experiment-based learning have helped the students to understand the subject in a proper way. The consistency of cement is necessary to conduct other tests like compressive strength, setting time determination etc.



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Department of Civil Engineering

Course Name: Environmental Engineering

Instructor Name: E. Giri Prasad Goud

Approach: Field visit

Topic: Unit II: Layout and general outline of water treatment units.

CO: 2

PO's: PO1, PO3, PO7, PO10

There are varieties of teaching and learning process adopted in civil engineering through which students can understand the subject thoroughly with an easier manner. For the subject Environmental Engineering, field visit has been conducted, which aims to understand the technical concepts of how the water treatment plant units will work. It helps bridge the gap between education and hands – on experience. Some of the examples are given below.

Unit II: water treatment units (subject covered)

Photos demonstrate students observing the working of water treatment units. The main purpose of the visit is to give clear idea of how the treatment units work in practice, how the operational troubles will overcome in the real scenario and students are interacting with site engineers. In water treatment plant, the location of each treatment unit and the sequence in which they will be operated has been made understood clearly to the students.



Field visit to water treatment plant

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Department of Civil Engineering

Course Name: Environmental Science

Instructor Name: Mr. Anand

Approach: Visualization

Topic: Unit 3: Environmental Pollution and Control Technologies: Air Pollution


CO:3

PO's: PO1, PO6, PO7, PO12

Goal: To illustrate the Air pollution controlling technologies of Cyclone Separators and Bag House Filters animated videos with different sizes of Suspended Particulate Matter (SPM) removal from the air.

Classroom activity: To explain how the air is polluted and how that air pollution can be minimized or controlled has been shown to the students with the animated videos of air pollution control technologies like Cyclone separators, Bag house Filters and shown how efficiently they could remove the Suspended Particulate Matter (SPM) in air with different sizes of particulate matter. This presentation has clearly explained to the students through visualization of video and students have clearly understood how the instruments work in minimizing the particulate matter so that the Air pollution can be minimized in the classroom.


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Department of Civil Engineering

Course Name: Surveying and Geomatics

Instructor Name: G Uma Shanker

Approach: Demonstration Based Learning

Topic: Unit IV: Parts of Total Station: Demonstration of parts of Total Station Instrument.

CO:1

PO's: PO1, PO2, PO6, PO7, PO12

Goal: To demonstrate the parts of the Total station instrument.

Accessories required: Total station Instrument, Prism and Tripod.


Concept:

The Total station is a surveying instrument, which is capable of measuring angles, distances and coordinates of points. The instrument has various parts in it, such as Handle, Handle securing screw, Data input/output terminal (Remove handle to view), Instrument height mark, Battery cover, Operation panel, Tribrach clamp (SET300S/500S/600S: Shifting clamp), Base plate, Levelling foot screw, The circular level adjusting screws, Circular Level, Display, Objective lens, Tubular compass slot, Optical plummet focusing ring, Optical plummet reticle cover, Optical plummet eyepiece, Horizontal clamp, A horizontal fine-motion screw, Data input/output connector (Besides the operation panel on SET600/600S), External power source connector (Not included on SET600/600S), Plate level, Plate level adjusting screw, Vertical clamp A, vertical fine-motion screw, Telescope eyepiece, Telescope focusing ring, Peep sight, Instrument centre mark. Practically showing and explaining the significance of various parts of the total station.



Pic: Total station instrument is shown to the students

Classroom activity: The Total station and its accessories are brought to the classroom to practically show various parts it has to the students. Students are practically explained about its parts and significance in the functioning of the instrument. Later after the explanation, a batch of students called on and asked to identify and explain the few parts mentioned.


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Department of Civil Engineering

Course Name: Solid Mechanics -I (A23102)

Instructor Name: V. Swathi

Approach: Demonstration Based Learning

Topic: Unit 5: Deflection of Cantilever Beam

CO: 5

PO's: PO1, PO2, PO3, PO4, PO6, PO7, PO12

Goal: To demonstrate concept of deflection of cantilever beams when load is acting at free end.

Concept: Deflection, in structural engineering terms, means the movement of a beam or node from its original position. It happens due to the forces and loads being applied to the body. Deflection also referred to as displacement, which can occur from externally applied loads or from the weight of the body structure itself.

$$\delta = \frac{wl^3}{3EI}$$

Classroom activity: To demonstrate the Deflection of Cantilever Beam when point load is acting at free end. Cantilever beam setup, weights and dialgauge is required to perform the test.

The beam was clamped in a support. Three different points were marked on the beam and the gauge was fixed at one point at the free end of the beam. The initial value of deflection with hanger hanging on the beam was measured. 100g of load was applied in the hanger and the value on gauge was noted. The difference of first value and this value was deflection. An increment of 100g was applied and the value of deflection was noted at each load.


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Department of Civil Engineering

Course Name: **HYDRAULICS & HYDRAULIC MACHINERY**

Instructor Name: Mrs. Dhanasree Pooja

Approach: Visualization Based Learning

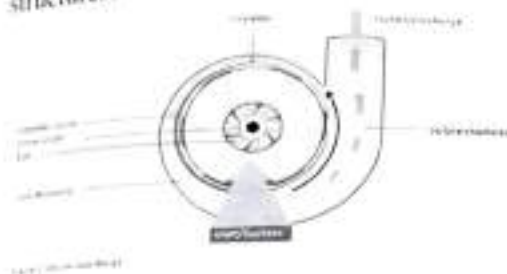
Topic: Unit V: CENTRIFUGAL PUMP: Working of centrifugal pump.

CO: 5

PO's: PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO10

Goal: To study the working principle of Centrifugal pump.

Concept: To understand the working principle of Centrifugal pump in the Hydraulic structures.



Classroom activity: In this section, we discussed how a centrifugal pump operates. Centrifugal pumps work to produce flow or raise a fluid from a lower level to a higher level. The working of these pumps is based on a straightforward mechanism. A centrifugal pump turns rotational energy coming from a motor into energy in a moving fluid. The two main components responsible for this task are the impeller, and the casing, both of which belong to the portion of the pump called the wet end. The impeller is the rotating part, and the casing is the airtight path that surrounds the impeller. The fluid in a centrifugal pump enters the casing, falls on the impeller vanes at the impeller eye, and rotates radially outward until it exits the impeller through the diffuser (volute) of the casing. As it passes through the impeller, the fluid gains both velocity and pressure. With appropriate equations students were able to calculate losses and efficiencies, minimum starting speed.



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Department of Civil Engineering

Course Name: AIR POLLUTION AND CONTROL METHODS

Instructor Name: Mr. Anand

Approach: Visualization based learning

Topic: Unit 1 – GLOBAL WARMING

CO: 1

PO's: PO1, PO6, PO7

Goal: To demonstrate the impacts of air pollutants on globe which is leading to global warming

Concept: Global warming is a gradual increase in the earth's temperature generally due to the greenhouse effect caused by increased levels of carbon dioxide, CFCs, and other pollutants. This phenomenon has been observed over the past one or two centuries. This change has disturbed the climatic pattern of the earth. However, the concept of global warming is quite controversial but the scientists have provided relevant data in support of the fact that the temperature of the earth is rising constantly. There are several causes of global warming, which have a negative effect on humans, plants and animals. These causes may be natural or might be the outcome of human activities. In order to curb the issues, it is very important to understand the negative impacts of global warming.

Classroom activity: A Video lecture has been demonstrated on GLOBAL WARMING FROM 1880 – 2022 to understand the drastic change in climatical conditions due to rapid growth in urbanization in these two decades which is affecting the environment to greater extent. By this video the students are exposed to the knowledge on the current global problems and shall move towards in reducing the production of such gases by living sustainable and low carbon lifestyle.

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Department of Civil Engineering

Course Name: Green Building Technologies

Instructor Name: Mr. Vithal

Approach: Industrial Visit

Topic: Unit I, II, III

CO:1,2,3

PO's:PO1, PO2, PO3 PO6, PO7, PO12

Goal: To demonstrate Principle and working of Green Building

Concept: A green building is an environmentally sustainable structure, which makes efficient use of land, materials, energy, and water while costing less in terms of maintenance charges. A green building enhances energy efficiency, limits water consumption, and makes maximum use of recycled and locally available, recyclable, and non-toxic materials.

Industrial Visit: For more understanding of Green Building Principle, Working, Design aspects students visited to Green Building Centre at Kondapur, Hyderabad with this student were able to understand with various aspects like 1. Sustainable Site Design 2. Water Quality & Conservation 3. Energy & Environment 4. Indoor Environmental Quality 5. Material use



Student visit to Green Building Centre, CII Hyderabad Kondapur

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Department of Civil Engineering

Course Name: Pre stressed Concrete Structures(A27127)

Instructor Name: Dr. Saduwale Shrihari

Approach: ICT Based Learning

Topic: Unit 2: Losses of pre stress

CO: 2

PO's: PO1, PO2, PO3, PO4, PO6, PO7, PO12

Goal: To demonstrate concept of Losses of pre stress

Concept:

Prestressing is applying compressive stress to concrete to mitigate tensile strains caused by a load. Losses in prestressing are the slow lowering of the induced compressive stress in a prestressed part due to various factors.

Classroom activity: To demonstrate the concept of losses of prestress using power point presentation.

Losses of pre stress are classified into two types:

1. Short term or immediate losses.
2. Long term or time dependent losses.

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Department of Civil Engineering

Course Name: Railways Airports and Harbour Engineering Instructor

Name: Ms. V.Navodaya

Approach: Field and Industrial Visits

Topic: Unit II: Components on Railway tracks

CO:2

PO's: PO1, PO2, PO6, PO7, PO12

Goal: This visit introduces the students with the various structural part of some special structures and their components as well as their safety features. Some other purpose was to know about the solutions of the Structural Deformation & Damage Prevention for any Structure as well as Maintenance of Structure.

Concept: The railway track or permanent way is a component of railway lines that consists of pairs of rails typically laid on sleepers or ties embedded in ballast and intended to carry ordinary trains. The term "permanent way" refers to the fact that in the early days of railway construction, contractors would frequently lay a temporary track to transport soil and materials around the site. Once this work was substantially completed, the temporary track was removed, and the permanent way was installed



Students could study different components of Railway and could see different operations such as Changing of Track and applying brakes etc

Navodaya

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Navodaya
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Department of Civil Engineering

Course Name: **BUILDING MATERIALS AND CONSTRUCTION**

Instructor Name: **Dr. Pallavi Badry**

Approach: **Demonstration Based Learning**

Topic: **Unit 1-Stones and Bricks**

CO: **1**

PO's: **PO1, PO2, PO4, PO7**

Goal: Tests on Bricks are important parameters that indicate the quality, strength and durability for the purpose of construction.

Concept: Water absorption test on Bricks

This test involves soaking the bricks in water for a specified period of time and then weighing them to calculate their water absorption rate. The results of this test will be useful for determining the suitability of bricks for various construction applications.

Classroom activity: Experiment Conducted on Water absorption test on Bricks

In this approach, Concrete and highway laboratory is chosen for conducting experiment.

The students were given time to do experiment and the experiment-based learning have helped the students to understand the subject in a proper way. For the water absorption test, the specimens are dried in an oven for 24 hours at required temperature and then placed in a desiccator to cool. Immediately upon cooling the specimens are weighed. The material is then emerged in water at agreed upon conditions, often 23°C for 24 hours. Water absorption is defined as the amount of water absorbed by a material and is calculated as the ratio of the weight of water absorbed to the weight of the dry material. Water absorption is used to determine the amount of water absorbed under specified conditions.


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Department of Civil Engineering

Course Name: GROUND IMPROVEMENT TECHNIQUES

Instructor Name: Mrs. Tirumala Deepika

Approach: Visualization based learning

Topic: Unit 4 - Grouting methods

CO: 4


PO's: PO1, PO2

Goal: To demonstrate concept of grouting

Concept: Grouting is a process whereby fluid like material either in suspension or solution form is injected into sub-surface soil or rock to achieve in decrease in permeability and compressibility to improve its strength and decrease its seepage flow. This method is used a preventive measure before construction process or as a rehabilitative treatment for structures suffering post-construction distress due to poor soil condition.

Classroom activity: There are varieties of teaching and learning process adopted in civil engineering through which students can understand the subject thoroughly with an easier manner. For the subject Ground Improvement Techniques real time grouting method visualization has been adopted which aims to understand the technical concepts of grouting methodology. Using videos of different grouting techniques an attempt is made to demonstrate the procedure of grouting in filed applications. This helped the students to bridge the gap between education and hands – on experience.


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Department of Civil Engineering

Course Name: Design Of Steel Structures

Instructor Name: Ashwin Kumar M

Approach: Visualization based learning

Topic: Unit 4 – Column Splicing

CO: 4

PO's: PO3, PO4, PO5

Goal: To demonstrate concept of column splicing

Concept: Column splicing is done when the available length of structural steel section is less than the required length of column. Column splices are essentially steel plated bolted connection provided in multi-storey steel construction to serve as connection between two columns. Function of splice is to transfer axial, shear and flexural forces from one column to other to ensure continuity and stability. Column splice is placed close to the place where lateral restraint is possible and it should be away from points of maximum deflection.

Classroom activity: There are varieties of teaching and learning process adopted in civil engineering through which students can understand the subject thoroughly with an easier manner. For the subject design of steel structures real time visualization has been adopted which aims to understand the technical concepts of column splicing. Using videos of different column splicing techniques an attempt is made to demonstrate the procedure of how splicing is done for the columns in field applications. This helped the students to bridge the gap between education and hands – on experience.

Ashwin
Faculty Incharge

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Department of Civil Engineering

Course Name: Foundation Engineering

Instructor Name: MS. Rebba Abhigna

Approach: Field Visit

Topic: Unit 3: Detailing and types of foundation

CO:3

PO's: PO1, PO2, PO6, PO7, PO12

Goal: The main objective of this site visit is to make the students understand about the soil investigation and laying of foundation to explore and identify different types of foundations.

Concept: In foundation Engineering course there is a concept known as types of foundation and evaluating the safe bearing capacities of different types of soil strata. Depending upon the type of Soil different exploration methods will be adopted and by performing index properties and engineering properties which includes (C and Φ parameters) type of foundations will be laid.

Field Visit: To make students to understand about the field conditions of soil and variation in depth of foundation a field visit at VJIT new hostel block which is located at back side of D block has been arranged for III-year II semester students. Here students have been explained regarding depth of foundation and differences in depths of foundations. Students have observed differences in depth of foundation beds due to hard and soft soil strata. This site visit helped students correlate the lectures with the procedural knowledge gained at the site. Students observed the laying of CC beds in different elevations in the foundation due to variations in soil strata corresponding to its bearing capacities. Finally, this site visit helped students for better understanding about the types foundation. Shape of the footings reinforcement details and planning execution the structure.



Students visited VJIT new hostel block construction Site

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Department of Civil Engineering

Course Name: REHABILITATION AND RETROFITTING OF STRUCTURES

Instructor Name: Mrs. Thirumala Sujatha

Approach: Demonstration Based Learning

Topic: Unit 4: Techniques for Repair and Protection Methods:

CO: 4

PO's: PO1, PO2, PO3, PO4, PO6, PO7, PO12

Goal: To demonstrate concept of Non-destructive Techniques.

Concept: Non-destructive tests of concrete are a method to obtain the compressive strength and other properties of concrete from the existing structures. This test provides immediate results and actual strength and properties of concrete structure.

Following are different methods of NDT on concrete:

1. Penetration method
2. Rebound hammer method
3. Pull out test method
4. Ultrasonic pulse velocity method
5. Radioactive methods

Classroom activity: To demonstrate the Rebound hammer method and Ultrasonic pulse velocity method

The rebound hammer is a surface hardness tester for which an empirical correlation has been established between strength and rebound number.

The only known instrument to make use of the rebound principle for concrete testing is the Schmidt hammer, which weighs about 4 lb (1.8 kg) and is suitable for both laboratory and field work. It consists of a spring-controlled hammer mass that slides on a plunger within a tubular housing.

The hammer is forced against the surface of the concrete by the spring and the distance of rebound is measured on a scale. The test surface can be horizontal, vertical or at any angle but the instrument must be calibrated in this position. The results are affected by factors such as smoothness of surface, size and shape of specimen, moisture condition of the concrete, type of cement and coarse aggregate, and extent of carbonation of surface.

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