INNOVATIONS BY THE FACULTY IN TEACHING AND LEARNING

For effective teaching – learning process, following innovations are adopted by the faculties of Civil engineering Department.

1. Use of modern teaching tools like LCD projectors and computer systems with internet facility in classrooms and labs.
2. Use of ICT tools such as lecture capture system in classroom.
3. Organizing technical talks
4. Visit to nearby construction sites.
5. Organizing technical/industrial trips/tours.
6. Model making competition.
7. Final year students are encouraged to take up project works related to societal needs.
8. Final year students are encouraged to give technical seminar on current trends in Engineering and Technology by referring the journal papers.
9. Explaining the concepts through NPTEL video lectures.
10. Explaining real world examples in class.
11. Providing laboratory manuals for better understanding of the experiments.
12. Taking tutorial / special classes.

Innovation by Faculties in Teaching - Learning

Sl No	Target Subject with Code	Faculty Name	Pedagogical Initiatives	Outcomes
1	Elements of civil engineering & engineering mechanics (18CIV14/24)	Sri. R S Chikkanagoudar	• Detailed explanation on equilibrium of coplanar concurrent forces • Experimental demonstration of universal force table	• Verifying law of triangle. • Verifying law of Parallelogram of forces. • Mathematical understanding of Equilibrium of Forces.
2	Basic and Applied Geotechnical Engineering (18CV54,18CV62), Geotechnical engineering laboratory (18CVL77, 17CVL67)	Sri. R S Chikkanagoudar	• An Excel workbook with C program embedded in it to find the shear strength parameters of soil, soil classification and safe bearing capacity of soil.	• Reduces the time consumption • Provides accuracy • Avoids the human errors
3	Computer aided design of reinforced cement concrete stairs.	Sir. R S Chikkanagoudar	• Stairs are the means of communication between the floors of the structure • The structural design of stairs is a routine task for the designers • Hence two programs (1- Dog legged & 2- Open Newel) were developed in FORTRAN, adopting the recommendations of IS-456-1978	• Reduces the time consumption for routine tasks. • Easy to understand. • Provides accurate data. • Human errors can be checked.
4	Concrete technology (17CV44/18CV44)	Sir. R S Chikkanagoudar	• An excel spread sheet is developed in order to find out the mixed design of a concrete. • Also weight of concrete and its components required to cast moulds of different shapes like cubes, cylinders and also slump cone were incorporated.	• Reduces the time consumption for design calculations. • Easy to understand. • Provides accurate data. • Human errors can be checked.
5	Concrete Technology	Dr. Anila Kumar C P	• Impact strength is calculated with the procedure suggested by the Ernest K. Schrander.	• Impact strength is calculated. • Ultimate failure also recorded.
6	Concrete technology	Sir. R S Chikkanagoudar	• Compression test on the Geopolymer concrete is conducted and their values are incorporated into the excel spread sheets • Bases on results compressive stregth versus AL/FA graph were plotted	• Variation of compressive strength of GPC with alkaline solution. • Variation of compressive strength of GPC with water content. • Substitute for OPC with alkaline solutions.

Sl No	Target Subject with Code	Faculty Name	Pedagogical Initiatives	Outcomes
7.	Rigid Pavements	Dr. Vijaya Kumar C S	• Temperature differentials variation in the rigid pavements at different levels can be analysed using Thermocouples	• Students are able to understand the clear concept of temperature differentials and peak negative temperature differentials in the rigid pavements.
8.	Hydrology and Irrigation Engineering (18CV63)	Sri Praveen Kumar G B	• Students were taken to the place where Rain gauge station is installed. • Rain gauge Type: Non Automatic (Simon's Rain gauge)	• Clear understanding and Practical Demonstration of the working of Rain gauge station.
9.	Air Pollution and Control	Dr. Suresh B	• Practical demonstration of metrological instruments were used to explain the concepts of wind rose diagrams	• Student are able to understand the concept of wind rose and properties of wind.
10	Design of RCC and Steel Structures	Dr. Chidananda G	• Conducted online quiz using Google Forms, an LMS. • NPTEL video was uploaded in TED-Ed. Students were supposed to go through the Video and answer the questions.	• Taking up Quiz enhances the confidence of students to take up competitive exams which are objective in nature. • Students can go through the video and answer the questions at their own pace which enables "Self Learning"

Description of the Innovative Teaching Learning

<table>
<tr><th>Sl. No.</th><th>Developed By Faculty</th><th>Description</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Sri. R S Chikkanagoudar</td><td colspan="2">The law of polygon of forces states that if a number of coplanar concurrent forces acting onb a body be represented in magnitude and direction by the sides of a polygon, taken in order,then there resultant is represented in magnitude and direction by the closing side of the polygon, taken opposite order. In order to find out the coplanar cuncurrent forces acting on a particle in Equilibrium and to find the values of unknown forces considering particle to be in equilibrium using universal force table. Universal force table comprises a circular alluminium disc of 40cm diameter graduated into 360 degree, Complete with levelling screws ,force sliding clamp pulleys, central ring and four sets of iron nickel lead slotted weights, where weights are attached to strings and the strings are in turn attached to the central ring, and adjust the pulleys such that central of ring coincides with the central pivot.</td></tr>
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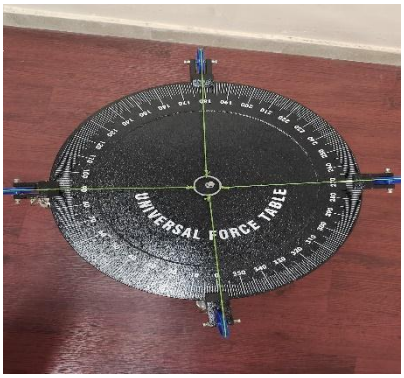
</td><td> 
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<tr><td rowspan="2">2</td><td rowspan="2">Sri. R S Chikkanagoudar</td><td colspan="2">Developed Excel sheet helps to find the index parameters of soil, shear strength of soil, and also used to find the safe bearing capacity of soil (embeded C Program) with or without reduce level of water table, it also provides the soil classification (C code is embedded) All these are integrated. it helps the engineers to reduce their presence in conducting experiments and finding the results, and also hleps to avoid the human errors, reduces the time consumption. Typical inputs for finding shear strength of soil consists: sigma 1, gamma (KN/m^3), depth (m), SBC (KN/m^2) and, output from the program contains: phi, cee.</td></tr>
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		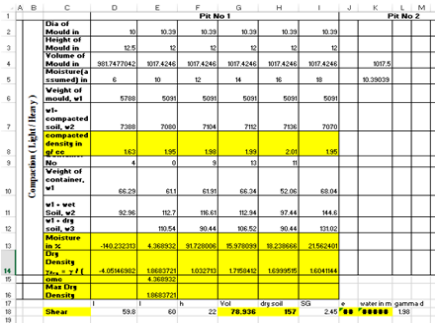 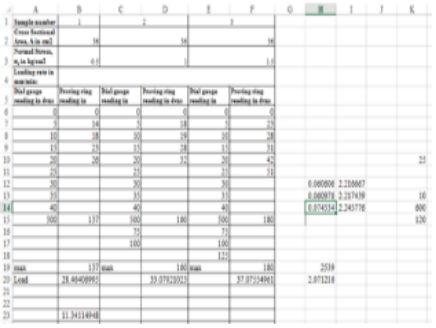
3	Sri. R S Chikkanagoudar	In this venture, two programs were written in FORTRAN. One for the design of dog legged stair and another for design of open newel stairs. Recommendations of IS-456-1978 are incorporated in these. These programs were called from the dBase program depending on the users option. The dBase program uses the customised for taking the input to these based on the users choice. The program for design of dog legged stairs involves a set of statements written to accept the input such as F/F height, Rise and Tread of steps, width of light, live load etc., Using this data, the program carries out computation of bending movement, design loads etc. Output from the program yields a ready to use the results such as waist slab thickness, longitudinal and distribution steal for different flights. In case of the design of open newel stairs, the program demands for the input such as rise, threads, number of steps in each flight, landing width, stresses in steel and concrete etc. This comprises two subroutines load and design. Subroutine load is assigned the work of computing the design loads due to live load, dead load and finishes. Subroutine design performs design calculation such as area of steel, spacing of bars etc. Output consists of reinforcement details for different flights.
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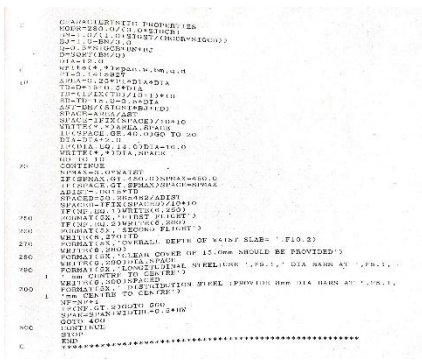
		PHOTO – 2 

VISION OF THE DEPARTMENT

To train the students to become Civil Engineers with leadership qualities, having ability to take up professional assignments and research with a focus on innovative approaches to cater to the needs of the society.

MISSION OF THE DEPARTMENT

1. To provide quality education through updated curriculum and conducive teaching learning environment for the students to excel in higher studies, competitive examinations and professional career.
2. To impart soft skills, leadership qualities and professional ethics among the graduates to handle the projects independently with confidence.
3. To deal with the contemporary issues and to cater to the socio-economic needs.
4. To build industry-institute interaction and to establish good rapport with alumni.

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<tr><td>4</td><td>Prof. R S Chikkanagoudar</td><td>Developed excel sheet helps to find out the proportions of cement, coarse aggregate, fine aggregate and amount of water required for a perfect design mix of concrete. Design mix also helps to find out the total weight of concrete and its components required to cast moulds of different shapes like cubes, cylinders, beams and also slump cone. It helps the engineers to reduce their time consumption in design calculations and finding the results. And also helps to reduce the human errors. Typical inputs for finding design mix of concrete consists; SG of cement, coarse aggregate and fine aggregate, grading zones, exposure conditions, water absorption. And outputs of design mix consist of weights of coarse aggregate, fine aggregate and super plasticizer and cement and also the amount of water.
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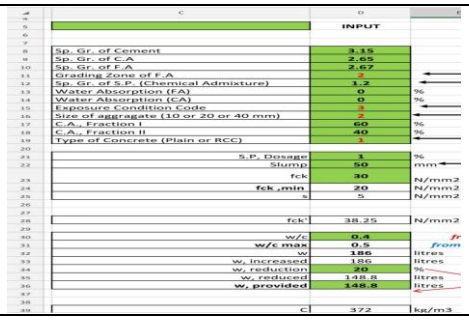
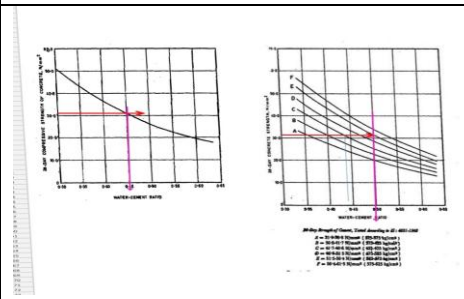
<tr><td> 
</td><td>  </td></tr>
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<tr><td>5</td><td>Dr. Anila kumar C P</td><td>Several methods may be used to determine the impact strength. For present study impact test equipment was fabricated in the laboratory and procedure suggested by Ernest K. Schrader was used. A cylindrical mould of diameter 152.4mm and 63.5mm height were cast for impact strength. The test specimen is placed on the base plate. It is free to move horizontally between the four positioning lugs. A bracket is placed over the test specimen which contains a cylindrical sleeve that positions a hardened steel bar and top of the test specimen. The ball is free to move vertically within the sleeve. A drop hammer of weight 45N is dropped from a height of 457mm top of ball. Number of blows from this standard mass required to cause the first visible crack and to cause ultimate failure are recorded.
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<tr><td>6</td><td>Prof. R S Chikkanagoudar</td><td>Similar to OPC mix design the proposed procedure is based on widely accepted performance criteria of strength, workability and cost. Initially a target of 7 days average compressive stregth is set which is used as a starting point for the design process. This is then located on the G-Graphs, from where a set of AL/FA, W/GPS, Molarity of the hydroxide solution curing time and curing temperature corresponding to the target strength is obtained. Based on the result we concluded that the compressive strength of GPC increases with increase in Alkaline solution and the compressive stregth of the geopolymer concrete decreases with the increase in water content. We also concluded that flyash can be used as 100% replacement of OPC with alkaline solution.
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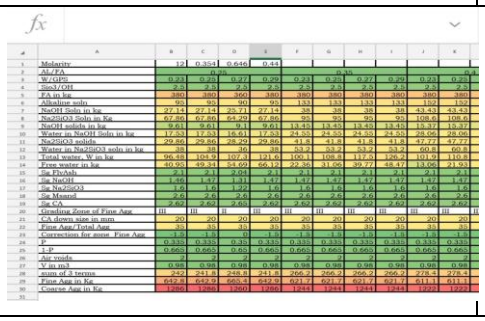
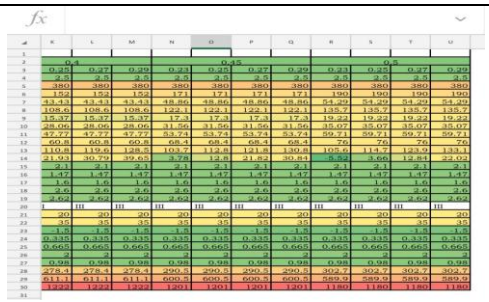
<tr><td>  </td><td>  </td></tr>
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<tr><td>7.</td><td>Dr. Vijaya Kumara C S</td><td>Due to the Scarcity of good quality Natural Sand (N-Sand) has made concrete manufacturers to look for suitable alternatives of ‘fine aggregates’. One of the suitable alternative is Crushed Stone Sand (CSS) or “Manufactured Sand” (M-Sand). In this study 3 slabs were cast with different material properties like slab(S1) cast with N- sand, Slab (S2) cast with M-sand and Slab (S3) cast with partially M-sand and partially N- sand. Three slabs of different material properties are cast, instrumented with thermocouples at different levels viz., top, middle and bottom to calculate stresses at interior edge and corner regions and the actual temperature in the slabs are recorded every hour for 28 days using a digital temperature recorder.
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<tr><td>8.</td><td>Praveen Kumar G B</td><td>Description:
Simon’s Rain gauge is the most common type of N0n-Automatic rain gauge and is used by IMD. It consists of a cylindrical vessel of 12.5cm in diameter with a base enlarged to 20cm diameter. The top section is a funnel provided with circular brass rim exactly 12.5cm internal diameter. The funnel shank is inserted in the neck of receiving bottle which is 7.5cm to 10cm. The raingauge is setup on a level surface as shown in the fig. The rim should be 30cm above the surface of the ground. The rain falling into the funnel is collected in the receiver and is measured in a special measuring glass graduated in millimeter (mm). The rainfall is measured every day at 8:30am IST. During a heavy rainfall this quantity is frequently exceeded, the rain should be measured 3 or 4 times in a day on day of heavy rainfall.
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<tr><td>9.</td><td>Dr. Suresh B</td><td>An automatic weather station (AWS) is an automated version of the traditional weather station, it is used to measure the metrological data from specific places. An AWS will typically consist of a weather-proof enclosure containing the data logger, rechargeable battery, telemetry (optional) and the meteorological sensors with an attached solar panel, wind turbine and mounted upon a mast. The specific configuration may vary due to the purpose of the system. The system may report in near real time using automatic systems and save the data for later recovery.
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