



Agnel Charities

## Fr. C. Rodrigues Institute of Technology, Vashi

(An Autonomous Institute & Permanently Affiliated to University of Mumbai)

Details of innovative teaching activities is given below:

### Innovative Teaching Summary -FH 2024

S.N.	Name of the Faculty	Subject	Innovative method used
1	Dr. Bindu S	Power System Protection & Switchgear	MCB, MCCB, CB are given as Flip class, Numeric relay and static relay as self-study, SF6 and Vacuum CG through a guided worksheet.
2	Dr. Mini Rajeev	Power Electronic Devices & Circuits	Demonstration of Switched Mode Power Supply (SMPS) unit and UPS of Personal Computer in the class to enhance the practical knowledge of Power Electronic Converter application.
3	Dr. Bindu R	Electrical AC Machines I	<ul style="list-style-type: none"> <li>• Good videos showing the construction and working principle of both three phase transformer and induction motor were shared with students. A discussion was done on the same in the practical session while demonstrating the different parts of the three phase distribution transformer available in the lab. Similarly, dismantled parts of both squirrel cage and slip ring induction motors were demonstrated.</li> <li>• To give an idea about different transformer connections, three 1<math>\Phi</math> transformers are taken, polarity tests are conducted and connected them to obtain Dy11 (vector group) transformer. Before doing the actual experiment, an additional exercise is done with sticks to form various vector groups. Also, open delta (V-V) connection is done using two single-phase-transformers. The class is divided into 6 groups and the identified fast learners were motivated to guide the other members of the group.</li> <li>• To create interest and to improve the level of understanding of the students, a group activity is conducted. A power point presentation is taken where the topics to be presented in the class are shared in advance with students. The class is divided into 6 groups and the identified fast learners were given the responsibility of coordination of each group.</li> </ul>
4	Dr. Mahendra Rane	Electrical System Design, Management and Auditing	<p>Visual clip on HT cable jointing is shown for the better understanding about skill set requirement during HT cable jointing process.</p> <p>For better understanding on real aspects of Electrical engineering drawings, BOQ, institute electrical installations drawings including SLD, panel drawings and BOQ were shown and discussed. Also, Institute substation visit conducted for better insight about distribution substation. To understand Electricity commercial bill and various terms associated with it, Institute electricity bills were shown and discussed to give real aspects of the terms. Small quiz conducted based on the activity.</p>
5	Dr. Mini K. Namboothiripad	Control System Design	As a group activity, Lag/Lead/Lag-lead compensator design algorithm with bode-plot is coded and simulated using MATLAB for a boost/buck converter. (using the specifications and transfer functions given by TI manual). And analysed the response using Simulink by connecting the designed compensator in loop with the converter.
6	Sreedevi S Nair	Micro Controller Applications	A set of application based questions were given to the class. Each student has to simulate one application and present the result.
7	Ruchi Harchandani	Signals and Systems	A presentation on Applications of Signals and Systems.



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8	Seema Jadhav	Lighting System Design	Seminar / Presentation: Seminar topics were given to the students consisting of 2 students in each group on Lighting System Design on real life applications
9	Rashmi Kale	Electric and Hybrid Electric Vehicle	Flip Class and Group Discussion Identified three students from each batch as leaders and made groups according to batches. Conducted group discussion on following points: 1. Need of EVs and HEVs. 2. Issues in EVs and HEVs. 3. Methods of Coupling in HEV. 4. Advantages and limitations of each type of HEV. 5. National EV model and International EV model. 6. National HEV model and International HEV model
10	Divya Sajeesh	Digital Electronics	Simulation in Virtual lab was given to the students for better understanding of the topic
11	Rajendra Soni	Automation and Control	Video Lectures were shown for better understanding of theory concepts.
12	Misbah Khan	Electrical Vehicle System Design	1. ADVISOR has been developed by the National Renewable Energy Laboratory. It is a tool that can be used to evaluate and quantify the vehicle level impacts of advanced technologies applied to vehicles. 2. It provides the vehicle engineering community with an easy-to-use and flexible, yet robust and supported analysis package for advanced vehicle modeling. 3. It is primarily used to quantify the fuel economy, performance, and emissions of vehicles that use alternative technologies, specifically EV/ HEV architectures. 4. It uses three primary graphical user interface (GUI) screens to guide the user through the simulation process. With the GUIs, the user can iteratively evaluate the impacts of vehicle parameters and drive cycle requirements the GUIs facilitate interaction with the raw input and output data that is present in the MATLAB workspace. 5. The vehicle model is depicted graphically using Simulink block diagrams to define the connections between components. The model then reads the input data from the MATLAB workspace during the simulation and outputs the results to the workspace to be viewed in the results window.
13	Nikita Jadhav	Energy Storage	Students formed groups and gave presentations on selected topics based on application.

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1	Dr Bindu S	HVDC Transmission Systems	Flip class on Harmonics and its impact on power system. Videos from NPTEL are shared to students to understand the concepts related to the shared topics and a test is conducted based on the topics.
2	Dr. Mini Rajeev	Advanced Power Electronics	Activity: Case study based on industry requirements. A set of requirements from industry was given and students were told to propose a solution meeting the stated requirements.
3	Dr. Bindu R	Electrical Drives and Control	Group Activity: One month was given to the groups for discussion and preparation of their selected electrical drive application. This is done to create interest and to improve the level of understanding of the students. Select any one Drive Application, Do the literature survey for the same. Identify the different parts of the drive. List out the Components selected. Give justification for the selection. Find out the modifications possible.



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			All the students participated in the power point presentations done at the end of one month and the presentation slides are submitted.
4	Dr. Mahendra Rane	Electrical Power System I	Small Visual shown to students related to different power generation plants
5	Dr. Mahendra Rane	Energy Audit and Management	As the subject is interdisciplinary, small visual related to electrical and mechanical systems shown for better understanding about the basics
6	Dr. Mini K. Namboothiripad	Digital Control System	Students presented seminars on Control Application in Electric vehicles, Voltage stabilization etc using various controllers such as PID controller, model predictive controller etc.
7	Dr. Mini K. Namboothiripad	Control System	Assignments are given to students related to bode plot which they should plot and analyze manually and should be verified using MATLAB.
8	Sreedevi S Nair	Analog Electronics	A set of semiconductor based electronic circuits and op-amp based circuits were given to the class. Students were asked to do simulation of the given circuits in LTspice software and submit report on the same.
9	Ruchi Harchandani	Electrical Power System II	Flip class was conducted on Z bus matrix formation. Students found Z bus matrix topic difficult. The topic was discussed with one bright student and the students conducted a session of 2 hrs in the supervision of faculty.
10	Seema Jadhav	Electrical Power System III	Complex problems were allotted to students group wise on Gauss-Siedel method for Load Flow Analysis, AGC and Power system stability.
11	Rashmi Kale	Electromagnetic Fields and Waves	Flip Class and Group Discussion on Applications of Electromagnetic field and waves
12	Divya Sajeesh	Electrical Circuit Analysis	The class was divided into groups of 10. Each group was given an electrical network that had to be solved and analyzed using software. The students have to submit the report with the analysis of the results obtained.
13	Rajendra Soni	Fundamentals of Electrical Machines & Measurements	An assignment of 10 Gate questions mixed in nature on machines and measurements portion was given which they have to submit and explain the solution. Also one design problem on conversion and range extension of PMMC instrument as a voltmeter was given to students and the same was verified experimentally and converted into an experiment.
14	Abhishek Shiwalkar	Electrical AC Machines-II	Seminar by students on Applications of Synchronous Machines. A group of maximum five students was formed and students gave seminar on any application of Synchronous Machines.
15	Misbah Khan	Micro grid and smart grid	SemiSel is the Semikron Danfoss online simulation tool was demonstrated for losses and temperature calculation as well as for optimum power electronic component selection.
16	Nikita Jadhav	Renewable Energy Sources	Flipped classroom on Module 6: Students formed groups and selected the topics for presentation. All groups presentation was evaluated.

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1	Dr Bindu S	Power System Protection and Switchgear	Air circuit breakers, SF6 circuit breakers, vacuum circuit breakers (working principle, Construction, operating mechanisms, ratings & applications) are given as flip class. Link of the Video Lecture by prof Dr Thrupathiraju Kanumuri, NIT Delhi had been shared with students through Microsoft teams. Students are asked to prepare the notes and demonstrate the working of air CB during lab. A quiz has been taken to evaluate the knowledge



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2	Dr. Mini Rajeev	Power Electronic Devices & Circuits	Application oriented question and its solution
3	Dr. Bindu R	Electrical AC Machines 1	As a group activity, the topics to be presented in the class are shared with students. This is done to create interest and to improve the level of understanding of the students. The class is divided into 6 groups and the identified fast learners were given the responsibility of coordination of each group.
4	Dr. Mini K. Namboothiripad	Control System Design	To make students confident with the design of gain, lag and lead compensators with bode-plot the following teaching technique is implemented: 1. The entire class with a strength of 67 students is divided into 17 groups (with maximum 4 students in each group) and separate set of questions provided for each group 2. Submissions are taken during lab time (as mentioned). During the submission, each student in the group need to explain all the three questions allotted to the group.
5	Sreedevi S Nair	Microcontroller Applications	A set of application oriented questions was given to class. Students were asked to simulate any one application using PIC micro controller and submit the report.(Group activity)
6	Seema Jadhav	Digital Electronics	<ul style="list-style-type: none"> <li>• Students were given course projects</li> <li>• Students need to demonstrate the output during lab</li> <li>• Prepare report with contents including Aim, Apparatus, Circuit diagram, Truth table, Procedure and Conclusion in Printed format</li> </ul>
7	Seema Jadhav	Lighting System Design	Presentation on Real life application in Lighting System Design
8	Rashmi Kale	Electric and Hybrid Electric Vehicles	Flip Class: Shared the information and material on different types of hybrid electric vehicles to the class which consist of 1. Series HEV 2. Parallel HEV 3. Series Parallel HEV 4. Complex HEV Group Discussion: Identified 11 students as leaders as mentioned in attendance sheet and made groups. There was discussion on following points 1. Method of coupling 2. Advantages and limitations of each type of HEV
9	Divya Sajeesh	Signals and systems	Students were divided into groups and each groups were given topics to write program in any software. Topics were chosen from the syllabus. Each groups have to analyze the simulation results and submit the report
10	Nikita Jadhav	High Voltage Engineering	Students selected topics and gave presentations on the selected topics. A field visit to high voltage lab is arranged to visualize and understand topics covered in theory.

### Innovative Teaching Summary – SH 2022

S.N.	Name of the Faculty	Subject	Innovative method used
1	Dr. Mini Rajeev	Advanced Power Electronics	Seminar by students on Applications of Power Electronic Converters based on Papers Published/ Industry training



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2	Dr. Bindu R.	Electrical Drives and Control	Group Activity to identify drive parts for different applications
3	Dr. Mahendra Rane	Electrical Power System-I	Small Visual clips related to power plants, touch, step potentials etc.
4	Ms. Misbah Khan	Renewable Energy Sources	1. Introduction to simulation software: PVsyst 2. Field visit: 100 KW Solar PV installation (In Campus)

### Innovative Teaching Summary: SH-2021

S.N	Name of Faculty	Subject	Innovative method used
1	Dr. Sushil Thale	EVT	Team Project
2	Dr. Bindu R.	Drives and Control	Real life application analysis in groups
3	Dr. Mini K. Namboothiripad	Industrial Controller	Group Activity: Prepare PPT based on the Topic assigned and present it in the class. And design with ladder diagram
4	Dr. Mahendra Rane	Electrical Power System-I	Present and discuss visual clip of real plant for better understanding
5	Dr. Mahendra Rane	Energy Audit & Management	Present and discuss visual clip of real utilities for better understanding
6	Divya M	EFW	Tutorials and simulations
7	Sreedevi Nair	Renewable Energy Sources	Group wise presentation
8	Ruchi H.	Control System	Group Project
9	Seema Jadhav	Power System-III	Complex Problem Analysis
10	Harshada Bhosale	Analog Electronics	Group wise presentation.
11	Divya S.	Electrical Power System - II	Quiz Competition
12	Rajendra Soni	Electromagnetic Fields and Waves	Gate Questions Discussed
13	Abhishek Shiwalkar	AC Machines-2	Seminar Presentations

### Innovative Teaching Summary: FH-2022

S.N	Name of Faculty	Subject	Innovative method used
1	Dr. Bindu S	Electric Traction	Flip Class: Each student group presented and evaluated by other groups
2	Dr. Mini Rajeev	Power Electronic Devices & Circuits	An application oriented question was given to the students to solve in class.
3	Dr. Bindu R.	Electrical AC Machines I	Group Activity: Prepare PPT based on the Topic assigned and present it in the class
4	Dr. Mini K. Namboothiripad	Control System Design	A group research activity to understand the application of PI controllers for converters
5	Dr. Mahendra Rane	DMES	Institute Substation visit and submit a report based on that
6	Mrs. Sreedevi Nair	Microcontroller Applications	A group activity done to understand the real time applications of PIC Microcontrollers
7	Mrs. Seema Jadhav	Illumination Engineering	Seminar presentation on real life application
8	Ms. Harshada Chavan	Energy Storage	Understand practical HESS systems implemented for different types of applications and submit a



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			report in groups.
9	Ms. Divya S.	Signals and Systems	Students groups were given topics to write program in MATLAB. Topics were chosen from the syllabus. Each groups have to analyze the simulation results and submit the report
10	Ms. Misbah Khan	Digital Electronics	2-bit comparator circuit was simulated using MULTISIMLIVE.

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