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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
ACADEMIC YEAR 2022-2023 (ODD SEMESTER)
Certification Course on "Simulation Tools for Electrical Engineering" - Report

The Department of Electrical and Electronics Engineering has organized a certification course on the topic "Simulation Tools for Electrical Engineering" on the following dates for third-year EEE students. The third-year EEE certificate course session dates are 01.08.2022, 02.08.2022, 03.08.2022, 04.08.2022, 05.08.2022, 06.08.2022, 17.09.2022 and 08.10.2022.

OBJECTIVES:

The main objective of this course is to help students:

- To know about the fundamentals of MATLAB tool.

- To provide an overview of elementary mathematics and graphics in MATLAB and solve Linear and Nonlinear Equations.

- To understand different branching statements and program design in MATLAB.

- To gain knowledge about MATLAB Simulink & solve Electrical engineering problems.

COURSE DETAILS:

The certification course on "Simulation Tools for Electrical Engineering" was allotted for III-year EEE Students, and a total of 30 hours was planned to conduct the entire course. This certification course provides a basic introduction to MATLAB programming and the Simulink model, and the applications of MATLAB in solving electrical engineering problems. MATLAB, an abbreviation of MATrix LABoratory, is a high-level technical computing environment suitable for solving scientific and engineering problems. The MATLAB family of programs includes the base program plus a variety of application-specific solutions called toolboxes. Toolboxes are comprehensive collections of MATLAB

functions that extend the MATLAB environment to solve particular class problems. The certification course contents are divided into five separate sections. Before the start of the course contents, a detailed explanation of various MATLAB windows was given to the students. In the first section, the students learned various concepts, such as an introduction to array programming, creating vectors and special matrices, different array functions, and solving linear equations using MATLAB. Also, exercises in matrices using MATLAB were given to the students in hands-on sessions.

The students learned how to perform elementary mathematics in MATLAB in the second section. In the second section, the students learned arithmetic operations, order of precedence, Trigonometry rounding functions, polynomials, complex numbers, exponents, logarithms, and Cartesian coordinate system conversion in MATLAB. At the end of the second section, exercises in elementary mathematics using MATLAB were given to the students through hands-on sessions. In the third section, various important concepts related to MATLAB graphics, such as 2D graph plotting, 2D bar graphs, pie charts, logarithmic plots, subplots, 3D graph plotting, editing in the plot window, and finally, animation in MATLAB were discussed. Also, exercises in graphics using MATLAB were given to the students in a separate hands-on session.

In the fourth section, the students learned important concepts and syntax related to MATLAB programming, such as creating M-Files, Input and Output Commands, fprintf function, built-in and basic user-defined functions, Logical Operators, branching statements, loops, and vectorization in MATLAB. At the end of the fourth section, exercises in MATLAB programming were given to the students through hands-on sessions. In the fifth section, a detailed introduction to MATLAB Simulink was given to the students. MATLAB Simulink software is used to simulate systems. It uses a GUI to interact with blocks that represent subsystems. The user can position the blocks, resize the blocks, label the blocks, specify block parameters, and interconnect blocks to form complete systems from which simulations can be run. The students learned how to develop half-wave controlled rectifiers, full-wave controlled rectifiers, Bridge controlled rectifiers, Buck regulators, and boost regulators models using MATLAB Simulink environment. The ability to design the different power electronics circuits through hands-on sessions helps the students better understand the operation of respective circuits. The students actively participated throughout the entire course sessions. They raised interesting questions, and
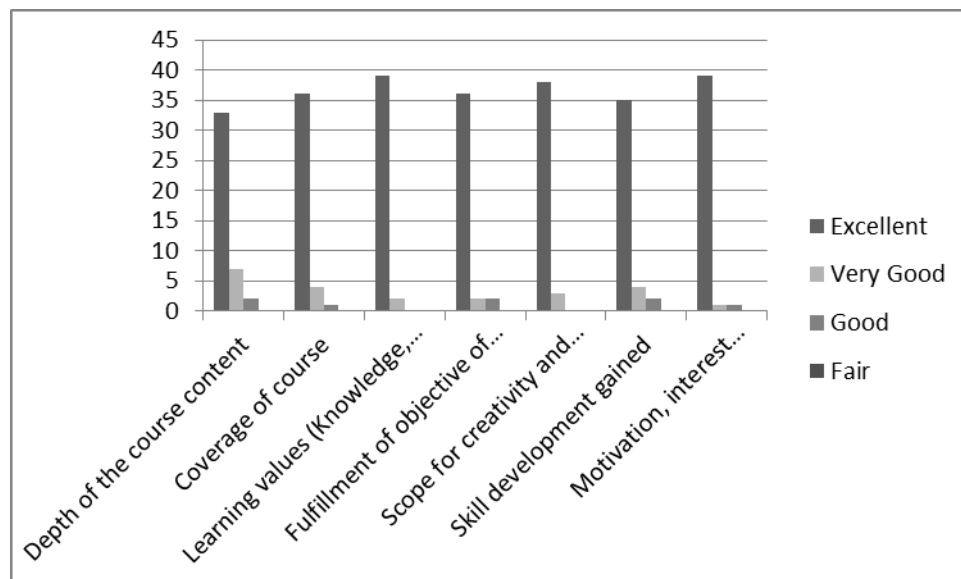
the faculty clarified their queries in the sessions. After completing the course contents, an assessment test was carried out to analyze the student performance, and certificates were awarded to the students who completed the course. Finally, the overall feedback of the students about the course was collected for future enhancements.

OUTCOME:

At the end of the course, the students should be able to,

- Understand the fundamentals of MATLAB tools.

- Program numerical differentiation and integration, solution of linear equations in MATLAB and solve electrical engineering problems.

- Analyze any given dataset with the help of MATLAB graphics.

- Implement loops, branching, control instruction, and functions in MATLAB programming environment.

- Simulate and solve electrical engineering problems using MATLAB Simulink models.

FEEDBACK ANALYSIS:

Snapshots from Certification Course

Block 2, Manamadurai - Tanjavur Rd, Tamil Nadu 613301, India
Tamil Nadu
India
2022-08-01(Mon) 04:04(PM)
35°C
95°F

Block 2, Manamadurai - Tanjavur Rd, Tamil Nadu 613301, India
Tamil Nadu
India
2022-08-02(Tue) 01:50(PM)
32°C
90°F

Block 2, Manamadurai - Tanjavur Rd, Tamil Nadu 613301, India

Tamil Nadu
India
2022-08-04(Thu)　04:02(PM)

30°C
86°F

Block 2, Manamadurai - Tanjavur Rd, Tamil Nadu 613301, India

Tamil Nadu
India
2022-08-04(Thu)　04:03(PM)

30°C
86°F

FACULTY INCHARGE　　　　　　　　　　　　　　　　　　　　**HOD/EEE**

PRINCIPAL