Surendranath Evening College

Department: Electronics (Previously Electronic Science)

Program Outcomes:

The overall aim is to:

- Provide students with learning experiences that develop broad knowledge and understanding of key concepts of electronic science and equip students with advanced scientific/technological capabilities for analysing and tackling the issues and problems in the field of electronics.
- Develop ability in students to apply knowledge and skills they have acquired to the solution of specific theoretical and applied problems in electronics.
- Develop abilities in students to design and develop innovative solutions for benefits of society, by diligence, leadership, team work and lifelong learning.
- Provide students with skills that enable them to get employment in industries, qualify in competitive exams like GATE, NET, SET, pursue higher studies or research assignments or turn as entrepreneurs.
- The introduction of the CCF (Curriculum and Credit Framework) under the aegis of NEP (National Education Policy) from the session 2023-24 empowers the student to select from a list of core, elective and other course topics in Electronics and related areas as per his requirement and inclination.

Program Specific Outcomes:

- Demonstrate extensive knowledge of the disciplinary foundation in the various areas of Electronics, as well as insight into contemporary research and development. Demonstrate specialized methodological knowledge in the specialized areas of Electronics about professional literature, statistical principles and reviewing scientific work.
- Demonstrate ability to apply electronics knowledge and experimental skills critically and systematically for assessment and solution of complex electronics problems and issues related to communication systems, embedded systems, computers networks, robotics, VLSI Design and fabrication and other specialized areas of electronics. Demonstrate ability to model, simulate and evaluate the phenomenon and systems in the advanced areas of electronics.
- Demonstrate ability to apply one's electronics knowledge, experimental skills, scientific methods and advanced design, simulation, and validation tools to identify and analyse complex real-life problems and frame technological solutions for them.
- Demonstrate ability to design and develop industrial products, processes and electronics systems while considering the circumstances and needs of individuals, organizations, and society with focus on economic, social, and environmental aspects.
- Communicate his or her conclusions, knowledge, and arguments effectively and professionally both in writing and by means of presentation to different audiences in both national and international context.
- Ability to work in collaborative manner with others in a team, contributions to the management, planning and implementations.
- Ability to independently propose research/developmental projects, plan its implementation, undertake its development, evaluate its outcomes, and report its results in proper manner.

- ❖ Ability to identify the personal need for further knowledge relating to the current and emerging areas of study by engaging in lifelong learning in practices.

COURSE OUTCOMES (4 Years Electronics Major): The learning outcomes from specific topics have been listed below:

SEMESTER 1:

CC-1: Fundamentals of Circuit Theory and Electronic Devices [Credits: 4 (3TH+1P)]: Study about electric circuit components, network theorems and dc and ac circuit analysis. Learn basic semiconductor theory and the working of semiconductor devices like diodes, bipolar junction transistors, field effect transistors and their circuits. Perform related experiments in the lab.

SEC-1: Introduction to Programming in Python [Credits: 4 (3TH+1P)]: Learn about the Python Language and how to write programs in Python. Get introduced to applications of Python in data science and analytics.

IDC-1: Fundamentals of Electronics [Credits: 3 (2TH+1TU)]: Introduce students of all disciplines (who may have opted for this course) to basic electronic components, devices, and circuits.

SEMESTER 2:

CC-2: Operational Amplifier and Digital Systems [Credits: 4 (3TH+1P)]: Learn about operational amplifiers and their applications. Study digital number systems, Boolean algebra, logic families, combinational and sequential circuits. Perform related experiments in the lab.

SEC-2: Artificial Intelligence for Everyone [Credits: 4 (3TH+1TU)]: Introduces students from all academic backgrounds to the fundamental concepts of artificial intelligence (AI).

IDC-2: Same as semester 1

CVAC-4: Domestic Application of Electronics [Credits: 2 (2TH)]: Introduces students from all academic disciplines to common domestic applications of electronics.

SEMESTER 3:

CC-3: Microprocessor and Microcontroller [Credits: 4 (3TH+1P)]: Study the 8085-microprocessor and the 8051-microcontroller along with related assembly language programming. Get introduced to the Arduino Uno board and related interfacing.

CC-4: Mathematical Foundation, Numerical Analysis and Scilab [Credits: 4 (3TH+1P)]: Study math topics like vector analysis, matrices, and differential equations. Get introduced to numerical methods to solve mathematical problems. Learn about Scilab, the open-source alternative to MATLAB, and how it can be used to perform mathematical calculations and analysis on a computer.

SEC-3: Circuit Simulation with PSPICE [Credits: 4 (3TH+1P)]: Learn how to use PSpice to simulate the behaviour of circuits containing passive and active components on the computer.

IDC-3: Same as semester 1

SEMESTER 4:

CC-5: Electronic Communication [Credits: 4 (3TH+1P)]: Learn about electronic communication systems, analog and digital modulation techniques, radio-wave propagation, and cellular communication.

CC-6: Signals and Systems [Credits: 4 (3TH+1P)]: Learn about discrete and continuous time signals, signals in the frequency domain, linear time invariant systems, mathematical tools like the Fourier series, Fourier transform and the Z-transform used in the study of signals and systems.

CC-7: Applied Physics [Credits: 4 (3TH+1P)]: Get introduced to the physics of crystals, quantum mechanics, statistical mechanics, and electric and magnetic properties of solids.

CC-8: Electromagnetism [Credits: 4 (3TH+1P)]: Study electrostatics, magnetostatics, Maxwell's equations and electromagnetic waves in conducting and non-conducting media. Learn how to use Scilab to visualize electric and magnetic flux fields on a computer.

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COURSE OUTCOMES (3 Years Electronics Multidisciplinary Major and Minor): The learning outcomes from specific topics have been listed below:

SEMESTER 1:

MD-CC-1: Fundamentals of Circuit Theory and Electronic Devices [Credits: 4 (3TH+1P)]: Study about electric circuit components, network theorems and dc and ac circuit analysis. Learn basic semiconductor theory and the working of semiconductor devices like diodes, bipolar junction transistors, field effect transistors and their circuits. Perform related experiments in the lab.

MD-SEC: Circuit Simulation with PSPICE [Credits: 4 (3TH+1P)]: Learn how to use PSpice to simulate the behaviour of circuits containing passive and active components on the computer.

MD-IDC: Fundamentals of Electronics [Credits: 3 (2TH+1TU)]: Introduce students of all disciplines (who may have opted for this course) to basic electronic components, devices, and circuits.

SEMESTER 2:

MD-CC-2: Operational Amplifier and Digital Systems [Credits: 4 (3TH+1P)]: Learn about operational amplifiers and their applications. Study digital number systems, Boolean algebra, logic families, combinational and sequential circuits. Perform related experiments in the lab.

MD-SEC: Same as semester 1

MD-IDC: Same as semester 1

CVAC-4: Domestic Application of Electronics [Credits: 2 (2TH)]: Introduces students from all academic disciplines to common domestic applications of electronics.

SEMESTER 3:

MD-CC-3: Microprocessor and Microcontroller [Credits: 4 (3TH+1P)]: Study the 8085-microprocessor and the 8051-microcontroller along with related assembly language programming. Get introduced to the Arduino Uno board and related interfacing.

MD-Minor-1: Fundamentals of Circuit Theory and Electronic Devices: Study about electric circuit components, network theorems and dc and ac circuit analysis. Learn basic semiconductor theory and the working of semiconductor devices like diodes, bipolar junction transistors, field effect transistors and their circuits. Perform related experiments in the lab.

MD-SEC: Same as semester 1

MD-IDC: Same as semester 1

SEMESTER 4:

MD-CC-4: Electronic Communication [Credits: 4 (3TH+1P)]: Learn about electronic communication systems, analog and digital modulation techniques, radio-wave propagation, and cellular communication.

MD-CC-5: Electromagnetism [Credits: 4 (3TH+1P)]: Study electrostatics, magnetostatics, Maxwell's equations and electromagnetic waves in conducting and non-conducting media. Learn how to use Scilab to visualize electric and magnetic flux fields on a computer.

MD-Minor-2: Operational Amplifier and Digital Systems: Learn about operational amplifiers and their applications. Study digital number systems, Boolean algebra, logic families, combinational and sequential circuits. Perform related experiments in the lab.

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COURSE OUTCOMES (Electronics Minor (with 4 Year Major in another subject)): The learning outcomes from specific topics have been listed below:

SEMESTER 1:

Minor-1: Fundamentals of Circuit Theory and Electronic Devices [Credits: 4 (3TH+1P)]: Study about electric circuit components, network theorems and dc and ac circuit analysis. Learn basic semiconductor theory and the working of semiconductor devices like diodes, bipolar junction transistors, field effect transistors and their circuits. Perform related experiments in the lab.

SEMESTER 2:

Minor-2: Operational Amplifier and Digital Systems [Credits: 4 (3TH+1P)]: Learn about operational amplifiers and their applications. Study digital number systems, Boolean algebra, logic families, combinational and sequential circuits. Perform related experiments in the lab.

SEMESTER 3:

Minor-1: Same as semester 1

SEMESTER 4:

Minor-2: same as semester 2