# Surendranath Evening College

## Lesson Plan for 2024-25

**Subject: Electronics (Honours & General)**

1. **Electronics (Honours)**

| 4-Year Major under CCF (semesters 1 and 3) | | | | |
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| **Sem.** | **Topics** | **Name of the teacher** | **No. of lectures** | **Time period** |
| **1 (CCF)** | **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. | Debasis Singha & Abhijit Poddar | 45 | Jul. 2024-Dec. 2024 |
| | **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. | Abhijit Poddar & -- | 45 | Jul. 2024-Dec. 2024 |
| | **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. | Abhijit Poddar & Debasis Singha | 30 | Jul. 2024-Dec. 2024 |
| **3 (CCF)** | **CC-3: Microprocessor and Microcontroller [Credits: 4 (3TH+1P)]:** Introduction to the architecture and programming of the 8085 microprocessor as well as the 8051 microcontroller. Introduction to the Arduino Uno microcontroller board. Learn through practical experiments how to interface the above with input and output devices like LEDs, switches, IC sensors etc. | Abhijit Poddar & Debasis Singha | 45 | Jul. 2024-Dec. 2024 |

| | Topics | Name of the teacher | No. of lectures | Time period | |
|---|---|---|---|---|---|
| | **CC-4: Mathematical Foundation, Numerical Analysis and Scilab [Credits: 4 (3TH+1P)]:** Learn about vectors, matrices, ordinary and partial differential equations and their applications. Introduction to numerical analysis and Scilab. | Abhijit Poddar & -- | 45 | Jul. 2024-Dec. 2024 | |
| | **SEC-3: Circuit Simulation with PSPICE [Credits: 4 (3TH+1P)]:** Introduction to SPICE and PSPICE circuit simulation software. Learn how to write netlists, perform dc, ac and transient analysis as well as how to model devices like diodes and transistors. | Abhijit Poddar & -- | 45 | Jul. 2024-Dec. 2024 | |
| | **IDC-3: Same as semester 1** | Abhijit Poddar & Debasis Singha | 30 | Jul. 2024-Dec. 2024 | |
| **4-Year Honours under CBCS (semester 5 only)** | | | | | |
| Sem. | Topics | Name of the teacher | No. of lectures | Time period | |
| **5 (CBCS)** | **ELTA-CC-11: Electronic Instrumentation:** Study in details the working of the different instruments one would encounter in an electronics lab, namely, current, voltage and impedance measuring instruments, analog to digital and digital to analog convertors, signal generators, transducers and most importantly, the ubiquitous oscilloscope, used to measure a host of signal parameters. Also perform experiments related to the above to have a better understanding. | Debasis Singha & -- | 56 | Jul. 2024-Dec. 2024 | |
| | **ELTA-CC-12: Microprocessors and Microcontrollers:** Get introduced to the working of a microprocessor (Intel's 8085) and also learn how to program a microprocessor, i.e. learn assembly language programming (ALP). Also learn the hardware and working of a microcontroller (PIC16F887). Parallelly learn to write and execute the ALPs for the 8085-microprocessor using a programming kit in the laboratory class. This topic will be very helpful for students interested in building a future career in the area of computer hardware. | Abhijit Poddar & Debasis Singha | 56 | Jul. 2024-Dec. 2024 | |

| | ELTA-DSE-1: Numerical Techniques: Learn how to solve mathematical equations and problems on a computer by learning numerical techniques and algorithms. Implement the techniques in the practical class on a computer using a high-level language or scientific programming software like MATLAB/SCILAB. | Abhijit Poddar & -- | 56 | Jul. 2024-Dec. 2024 | |
| | ELTA-DSE-2: Power Electronics: Learn the theory and working of high-power electronic devices like SCR, Diac, Triac, as also of DC and AC motors. Study the volt-ampere characteristics of a few of the devices in the practical class for a better understanding. | Debasis Singha & Abhijit Poddar | 56 | Jul. 2024-Dec. 2024 | |

| 4-Year Major under CCF (semesters 2 and 4) | | | | | |
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| Sem. | Topics | Name of the teacher | No. of lectures | Time period | |
| 2 (CCF) | 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. | Abhijit Poddar & Debasis Singha | 45 | Jan. 2025-Jun. 2025 | |
| | SEC-2: Artificial Intelligence for Everyone [Credits: 4 (3TH+1TU)]: Introduces students from all academic backgrounds to the fundamental concepts of artificial intelligence (AI). | Teachers of Computer Science | 45 | Jan. 2025-Jun. 2025 | |
| | IDC-2: Same as semester 1 | Abhijit Poddar & Debasis Singha | 30 | Jan. 2025-Jun. 2025 | |
| | CVAC-4: Domestic Application of Electronics [Credits: 2 (2TH)]: Introduces students from all academic disciplines to common domestic applications of electronics. | Abhijit Poddar & Debasis Singha | 30 | Jan. 2025-Jun. 2025 | |
| 4 (CCF) | CC-5: Electronic Communication [Credits: 4 (3TH+1P)]: Learn about frequency allocation for radio communication systems in India and TRAI, different types of analog and digital modulation techniques and systems, radio-wave propagation | Abhijit Poddar & Debasis Singha | 45 | Jan. 2025-Jun. 2025 | |

| | | | Name of the teacher | No. of lectures | Time period | |
|---|---|---|---|---|---|---|
| | and last but not the least, cellular communication. | | | | | |
| | **CC-6: Signals and Systems [Credits: 4 (3TH+1P)]:** Learn about classification and definitions of signals and systems used in electronic communication, Fourier series and Fourier transforms as well as the Z-transform. | | Abhijit Poddar & -- | 45 | Jan. 2025-Jun. 2025 | |
| | **CC-7: Applied Physics [Credits: 4 (3TH+1P)]:** Learn about crystallography, get introduced to quantum mechanics and statistical mechanics, learn about electric and magnetic properties of solids. | | Abhijit Poddar & -- | 45 | Jan. 2025-Jun. 2025 | |
| | **CC-8: Electromagnetism [Credits: 4 (3TH+1P)]:** Learn theory related to electrostatics, magnetostatics, Maxwell's equations and electromagnetic waves in non-conducting and conducting media. | | Abhijit Poddar & -- | 45 | Jan. 2025-Jun. 2025 | |

| 4-Year Honours under CBCS (semester 6 only) | | | | | | |
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| **No. of lectures** | **Time period** | | **Name of the teacher** | **No. of lectures** | **Time period** | |
| **6 (CBCS)** | **ELTA-CC-13: Communication Electronics:** Learn how message signals having information are transmitted electronically, the need for modulation, different types of analog and digital modulation techniques and systems. Perform relevant experiments in the practical classes using experimental kits or through simulation on a computer. | | Debasis Singha & Abhijit Poddar | 56 | Jan. 2025-Jun. 2025 | |
| | **ELTA-CC-14: Photonics:** Learn different theoretical aspects of physical optics like interference, diffraction and polarization. Learn the physics behind and working of different electro-optic devices like LEDs, LASERs, Photodetectors, LCDs and Fibre optic systems and perform related experiments for a better understanding. | | Abhijit Poddar & -- | 56 | Jan. 2025-Jun. 2025 | |
| | **ELTA-DSE-3: Digital Signal Processing:** Learn the theoretical aspects of digital signal processing, which deals with the analysis and processing of digitized voice, audio, video and other signals. Perform related simulation experiments in the lab. | | Debasis Singha & -- | 56 | Jan. 2025-Jun. 2025 | |

| | ELTA-DSE-4: Transmission Lines, Antenna and Microwave Devices: Learn the theory and working of twin-wire transmission lines, wave-guides, antenna as also about radiowave propagation and microwave devices like the Klystron and the Magnetron. Use MATLAB/SCILAB to perform simulated experiments related to the above in the practical class. Study of this topic would be beneficial to those wishing to study or work in the field of electronic communication in future. | Abhijit Poddar & -- | 56 | Jan. 2025-Jun. 2025 | |
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## 2. Electronics (General)

| 3-Year MDC/Minor under CCF (semesters 1 and 3) | | | | | |
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| Sem. | Topics | Name of the teacher | No. of lectures | Time period | |
| 1 (CCF) | CC1: Network Analysis and Analog Electronics: Learn how to mathematically analyse electric circuits using network simplification theorems. Learn the characteristics and working of basic electronic devices like the diode and the transistor. Learn about different applications of transistor as amplifiers and oscillators. Perform corresponding experiments in the lab on prototype boards to have a better understanding of the working of the devices and circuits. | Debasis Singha & Abhijit Poddar | 45 | Jul. 2024-Dec. 2024 | |
| | 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. | Abhijit Poddar & Debasis Singha | 30 | Jul. 2024-Dec. 2024 | |
| 3 (CCF) | CC-3: Microprocessor and Microcontroller Credits: 4 (3TH+1P)]: Introduction to the architecture and programming of the 8085 microprocessor as well as the 8051 microcontroller. Introduction to the Arduino Uno microcontroller board. Learn through practical experiments how to | Abhijit Poddar & Debasis Singha | 45 | Jul. 2024-Dec. 2024 | |

| Sem. | Topics | Name of the teacher | No. of lectures | Time period | |
|---|---|---|---|---|---|
| | interface the above with input and output devices like LEDs, switches, IC sensors etc.

**IDC-3: Same as semester 1** | Abhijit Poddar & Debasis Singha | 30 | Jul. 2024-Dec. 2024 | |

| 3-Year General under CBCS (semester 5 only) | | | | | |
|---|---|---|---|---|---|
| **Sem.** | **Topics** | **Name of the teacher** | **No. of lectures** | **Time period** | |
| 5 (CBCS) | **ELTG-DSE-1A: Photonic devices and power electronics:** Learn about photonic or optoelectronic devices like semiconductor lasers, solar cells, LCD displays. Get introduced to fiber-optics and fiber-optic systems. Also learn about power electronic devices and their applications. Also perform related practical experiments in the lab for better understanding of the working of few of the devices.

**ELTG-SEC-A: Same as Semester 3** | Abhijit Poddar & -- | 56 | Jul. 2024-Dec. 2024 | |

| 3-Year MDC/Minor under CCF (semesters 2 and 4) | | | | | |
|---|---|---|---|---|---|
| **Sem.** | **Topics** | **Name of the teacher** | **No. of lectures** | **Time period** | |
| 2 (CCF) | **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. | Debasis Singha & Abhijit Poddar | 45 | Jan. 2025-Jun. 2025 | |
| | **IDC same as semester 1.** | Abhijit Poddar & Debasis Singha | 30 | Jan. 2025-Jun. 2025 | |
| | **CVAC-4: Domestic Application of Electronics [Credits: 2 (2TH)]:** Introduces students from all academic disciplines to common domestic applications of electronics. | Abhijit Poddar & | 30 45 | Jan. 2025-Jun. 2025 | |

| Sem. | Topics | Name of the teacher | No. of lectures | Time period | |
|---|---|---|---|---|---|
| | | Debasis Singha | | | |
| 4 (CCF) | **CC-4: Electronic Communication [Credits: 4 (3TH+1P)]:** Learn about frequency allocation for radio communication systems in India and TRAI, different types of analog and digital modulation techniques and systems, radio-wave propagation and last but not the least, cellular communication. | Abhijit Poddar & Debasis Singha | 45 | Jan. 2025-Jun. 2025 | |
| | **CC-5: Electromagnetism [Credits: 4 (3TH+1P)]:** Learn theory related to electrostatics, magnetostatics, Maxwell's equations and electromagnetic waves in non-conducting and conducting media. | Abhijit Poddar & -- | 45 | Jan. 2025-Jun. 2025 | |

| 3-Year General under CBCS (semester 6 only) | | | | | |
|---|---|---|---|---|---|
| Sem. | Topics | Name of the teacher | No. of lectures | Time period | |
| 6 (CBCS) | **ELTG-DSE-1B: Electronic Instrumentation/ Transmission Lines, Antenna and Radio Wave Propagation:** Learn about instruments commonly used in the electronics laboratory including oscilloscopes and signal generators etc. Learn data acquisition using the Arduino board. Learn the use of basic bio-medical instruments. Perform lab experiments to have a better understanding. Alternatively, learn about radio wave propagation using transmission lines, waveguides, antennae etc. Also learn about different ways of radio wave propagation. Use mathematical software like MATLAB/SCILAB to simulate problems in radio-wave communication.<br><br>**ELTG-SEC-B: Same as semester 4.** | Debasis Singha & Abhijit Poddar | 56 | Jan. 2025-Jun. 2025 | |