

Surendranath Evening College

Lesson Plan for 2023-24

Subject: Electronics (Honours & General)

1. Electronics (Honours)

4-Year Major under CCF (semester 1 only)					
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. 2023- Dec. 2023	
	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. 2023- Dec. 2023	
	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. 2023- Dec. 2023	
4-Year Honours under CBCS (semesters 3 and 5)					
Sem.	Topics	Name of the teacher	No. of lectures	Time period	
3 (CBCS)	ELTA-CC-5: Semiconductor Devices: Learn how semiconductor devices like the diodes, bipolar transistors, field-effect transistors etc. work by studying their current-voltage characteristics. Perform experiments with the devices in the	Debasis Singha & Abhijit Poddar	56	Jul. 2023- Dec. 2023	

	<p>laboratory to have a better understanding of the characteristics.</p> <p>ELTA-CC-6: Electronic Circuits: Study the working of electronic circuits involving diodes, BJTs, JFETs etc., more specifically rectifiers, small-signal amplifiers, oscillators, tuned and power amplifiers. Perform laboratory experiments with the above circuits and have a better understanding.</p> <p>ELTA-CC-7: Electromagnetics: Study topics on vectors, electrostatics and electrodynamics as also from magnetism in order to be able to better understand the working of electronic communication systems to be taught later. Use SCILAB/ MATLAB software to perform simulations related to the above on a PC.</p> <p>ELTA-SEC-1: Circuit Modelling using PSPICE: Learn how to model and analyse electrical and electronic circuits on a computer using PSPICE. This would prove very useful to students from an employability perspective.</p>	<p>Debasis Singha & -</p> <p>Debasis Singha & Abhijit Poddar</p> <p>Abhijit Poddar & --</p>	<p>56</p> <p>56</p> <p>28</p>	<p>Jul. 2023- Dec. 2023</p> <p>Jul. 2023- Dec. 2023</p> <p>Jul. 2023- Dec. 2023</p>	
<p>5 (CBCS)</p>	<p>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.</p> <p>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). Parallely 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.</p>	<p>Debasis Singha & --</p> <p>Abhijit Poddar & Debasis Singha</p>	<p>56</p> <p>56</p>	<p>Jul. 2023- Dec. 2023</p> <p>Jul. 2023- Dec. 2023</p>	

	<p>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.</p>	Abhijit Poddar & --	56	Jul. 2023-Dec. 2023	
	<p>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.</p>	Debasis Singha & Abhijit Poddar	56	Jul. 2023-Dec. 2023	

4-Year Major under CCF (semester 2 only)

Sem.	Topics	Name of the teacher	No. of lectures	Time period	
2 (CCF)	<p>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.</p>	Abhijit Poddar & Debasis Singha	45	Jan. 2024-Jun. 2024	
	<p>SEC-2: Artificial Intelligence for Everyone [Credits: 4 (3TH+1TU)]: Introduces students from all academic backgrounds to the fundamental concepts of artificial intelligence (AI).</p>	Teachers of Computer Science	45	Jan. 2024-Jun. 2024	
	<p>IDC-2: Same as semester 1</p>	Abhijit Poddar & Debasis Singha	30	Jan. 2024-Jun. 2024	
	<p>CVAC-4: Domestic Application of Electronics [Credits: 2 (2TH)]: Introduces students from all academic disciplines to common domestic applications of electronics.</p>	Abhijit Poddar & Debasis Singha	30	Jan. 2024-Jun. 2024	

4-Year Honours under CBCS (semesters 4 and 6)

Sem.	Topics	Name of the teacher	No. of lectures	Time period	
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4 (CBCS)	<p>ELTA-CC-8: Operational Amplifiers and Applications: Learn the ins and outs of the very important operational amplifier IC chip, namely IC741. Also learn the working of other analog IC chips like the IC 555 timer, IC LM317 temperature sensor, IC regulators etc. Perform related experiments in the laboratory.</p>	Debasis Singha & -	56	Jan. 2024- Jun. 2024	
	<p>ELTA-CC-9: Digital Electronics and VHDL: Study the theory of digital electronics and related systems. Learn basic aspects of simulating digital circuits using the VHDL software on a computer. This will equip students later on seeking employment in electronics-hardware based companies.</p>	Abhijit Poddar & --	56	Jan. 2024- Jun. 2024	
	<p>ELTA-CC-10: Signals and Systems: Learn about signals and systems used in electronic communication and the theoretical procedures involved in analysing such signals. Use SCILAB/MATLAB to simulate the study of such signals on a PC as part of the practical class.</p>	Abhijit Poddar & --	56	Jan. 2024- Jun. 2024	
	<p>ELTA SEC B1/B2: Internet and Java Programming/Programming with MATLAB or SCILAB: Learn about the working of the internet and basic aspects of an object-oriented programming language like Java. Alternatively, study scientific programming using MATLAB or SCILAB, which was already introduced in earlier courses.</p>	Abhijit Poddar & --	28	Jan. 2024- Jun. 2024	
6 (CBCS)	<p>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.</p>	Debasis Singha & Abhijit Poddar	56	Jan. 2024- Jun. 2024	
	<p>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.</p>	Abhijit Poddar & --	56	Jan. 2024- Jun. 2024	

	<p>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.</p>	Debasis Singha & -	56	Jan. 2024-Jun. 2024	
	<p>ELTA-DSE-4: Transmission Lines, Antenna and Microwave Devices: Learn the theory and working of twin-wire transmission lines, waveguides, 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.</p>	Abhijit Poddar & --	56	Jan. 2024-Jun. 2024	

2. Electronics (General)

3-Year MDC/Minor under CCF (semester 1 only)					
Sem.	Topics	Name of the teacher	No. of lectures	Time period	
1 (CCF)	<p>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.</p>	Debasis Singha & Abhijit Poddar	45	Jul. 2023-Dec. 2023	
	<p>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.</p>	Abhijit Poddar & Debasis Singha	30	Jul. 2023-Dec. 2023	

3-Year General under CBCS (semesters 3 and 5)					
Sem.	Topics	Name of the teacher	No. of lectures	Time period	
3 (CBCS)	<p>ELTG-CC-3: Communication Electronics: Learn the basic theoretical aspects of electronic communication in the form of analog and digital modulation. Learn about cellular or mobile communication, the use of standards like GSM and CDMA, the basics of different cellular networks like 2G, 3G, 4G etc. Also, get introduced to GPS and satellite communication. Perform basic lab experiments on modulation. This course should help students have a working knowledge of how electronic signals having information are communicated and exchanged and enable them to put this knowledge to work in any future endeavour if needed.</p>	Debasis Singha & Abhijit Poddar	56	Jul. 2023- Dec. 2023	
	<p>ELTG-SEC-A: Computational Physics/Renewable Energy Harvesting: Learn scientific programming in FORTRAN, scientific word processing using LATEX and scientific visualization using GNUPLOT. Alternatively, learn the importance of fossil fuels, different forms of renewable energy and their harvesting.</p>	Abhijit Poddar/ Debasis Singha	28	Jul. 2023- Dec. 2023	
5 (CBCS)	<p>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.</p> <p>ELTG-SEC-A: Same as Semester 3</p>	Abhijit Poddar & --	56	Jul. 2023- Dec. 2023	
3-Year MDC/Minor under CCF (semester 2 only)					
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. 2024- Jun. 2024	
	IDC same as semester 1.	Abhijit Poddar & Debasis Singha	30	Jan. 2024- Jun. 2024	
	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. 2024- Jun. 2024	

3-Year General under CBCS (semesters 4 and 6)

Sem.	Topics	Name of the teacher	No. of lectures	Time period	
4 (CBCS)	ELTG-CC-4: Microprocessors and Microcontrollers: Learn about the hardware and working of the 8085-microprocessor and the 8051-microcontroller. Also learn about assembly language programming and how to program the 8085 and the 8051.	Abhijit Poddar & Debasis Singha	56	Jan. 2024- Jun. 2024	
	ELTG-SEC-B: Electrical Circuits and Network Skills: Learn about electric circuits, sources, measuring instruments. Learn basics of Electric Drawing. Learn about electric motors, electric wiring and protection. This skill-enhancement course would help those wishing to make a vocational career in this field.	Debasis Singha & --	28	Jan. 2024- Jun. 2024	
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	Debasis Singha & Abhijit Poddar	56	Jan. 2024- Jun. 2024	

	<p>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.</p> <p>ELTG-SEC-B: Same as semester 4.</p>				
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