CBCS Syllabus as per NEP 2020 for F. Y. B.Sc. (Computer Science) Electronics (2023 Pattern)

Name of the Programme : B.Sc. (Computer Science) Electronics

Programme Code : USCS

Class : F. Y. B.Sc.

Semester : I

Course Type : Skill Enhancement Course (Practical)

Course Code : COS-126-SEC (EL)

Course Title : Electronics Practical

No. of Credits : 02

No. of Teaching Hours : 60

Course Objectives:

1. To teach students how to know, identify, draw different symbols, logic diagramsand circuit diagrams.
2. To develop skill of circuit connections.
3. To train them to design and analyse circuits for specific purpose.
4. To motivate them to work on different mini projects.
5. To learn basic techniques to design digital circuits and fundamental concepts used in design of digital system.
6. To understand various number systems and their conversions.
7. To learn basic techniques to design digital circuits and fundamental concepts used in design of digital system.

Course Outcomes:

By the end of the course, students will be able to:

CO1. To identify different components, devices, IC's, as well as their types.

CO2. To understand basic parameters.

CO3. To know operation of different instruments used in the laboratory.

CO4. To connect circuit and do required performance analysis.

CO5. Develop hobby projects.

CO6: To perform the conversions among different number systems.

CO7: Identify different types of logic gates along with their ICs and also verify their truth tables.

List of Practical: (Any 8)

1. Electronics components: Resistors, capacitors, Inductors, Transformer, Switches, Relays, Fuses, Batteries, Cables, Connectors, Color coding of resistors, series and parallel combinations of resistors, capacitors & Inductors, diode, clipper and clamper, transistor.
2. Ohms law, voltage and current dividers, Kirchhoff's Laws (KCL, KVL), Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Superposition theorem.
3. Concept of Logic Gates – Statement, Symbol, Expression, Truth table of basic gates, Pinout diagrams - IC 7400, IC 7402, IC 7432, IC 7408, IC 7486, Basic Binary Rules for addition and subtraction, Half adder, Full adder, DE Morgan's theorem, Inter-conversion- Binary to Gray and Gray to Binary.
4. Use of measuring electronic Instruments (Multimeter, Signal Generators, Power supply)
5. Measurement of signal parameters (amplitude, period, frequency, peak voltage, peak to peak voltage, RMS value)
6. Study of electronic components (Resistor, Capacitor, inductor, Transformer, Switches, Fuses, Connectors, Cables, Diodes, Transistors, IC's)
7. Verification of network theorems: KCL / KVL.
8. Verification of network theorems: Thevenin/ Norton/ Maximum Power Transfer.
9. Build and test Clipper / Clamper circuit.
10. Verification of logic gates using IC's (7400, 7402, 7408, 7404, 7432, 7486)
11. Realization of basic gates using universal gates (NAND, NOR)
12. Study of Half & Full adder using gates.
13. Code converter : Binary to Gray and Gray to Binary
14. Verification of DE Morgan's theorem
15. To study Universal adder & subtractor

Activity: (Any one Activity equivalent to two experiments)

Students must perform at least one additional activity out of two activities in addition to eight experiments mentioned above. Total Laboratory work with additional activities should be equivalent to ten experiments.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	-	-	-	-	-
CO2	-	2	-	-	2	-	-
CO3	-	3	-	-	-	-	-
CO4	-		-	-	-	-	-
CO5	1	-	-	-	2	-	-
CO6	2	--	-	-	3	-	-
CO7	-	-	-	-	-	-	-

Justification of Mapping

PO1: Computer knowledge:

CO1: Understanding these components is crucial for students to grasp computer architecture and design.

CO5: Students we have get ideas for skill and electronics projects.

CO6: Knowledge of number systems is vital for understanding computer architecture. Memory addresses, CPU instructions, and data representation at the hardware level are often expressed in binary or hexadecimal. Conversions are necessary to interpret and work with these values.

PO2: Design/ development of a solution:

CO1: The ability to identify different components, devices, and integrated circuits (ICs) is crucial in the design and development of electronic solutions.

CO2: Understanding basic parameters and utilizing laboratory instruments for testing ensures that the final solution adheres to industry standards and regulations.

CO3: Knowing the operation of different instruments used in the laboratory is critical during the design and development phase. it use these instruments to test and measure various parameters, ensuring that the solution meets design specifications and quality standards.

PO5: Environmental Sustainability:

CO2: Understanding and selecting components And parameter with lower environmental impact contributes to sustainable practices in electronics.

CO5: Knowledge of energy-efficient devices is crucial for designing environmentally sustainable electronic systems.

CO6: Choosing sustainable data representation methods is important for minimizing environmental impact in computing.