TEMPLATE FOR COURSE SYLLABUS FOR NEP IMPLEMENTATION

Discipline: Science [√] Arts, Humanities & Social Science ☐

Commerce ☐ BBA ☐ BCA ☐

Subject Name: COMPUTER SCIENCE

Subject Code: UCMSMIN30003 (Will be provided by the University)

Semester: Semester I ☐ Semester II ☐ Semester III ☐ Semester IV ☐

Semester V [√] Semester VI [√] Semester VII ☐ Semester VIII ☐

Course Name: DIGITAL ELECTRONICS

Course Code: (Will be provided by the University)

Course Credit:	Theoretical	3	Practical/Tutorial	1
Marks Allotted:	Theoretical	60	Practical/Tutorial	0
	Continuing Evaluation	10	Attendance	5

Course Type (tick the correct alternatives):

Major Core	☐	AEC	☐
Interdisciplinary/ DSE	☐	SEC	☐
Minor / Generic Elective	[√]	VAC	☐
Research Project/Dissertation	☐	Vocational	☐

Is the course focused on employability / entrepreneurship? YES [√] NO ☐

Is the course focused on imparting life skill? YES [√] NO ☐

Is the course based on Activity? YES ☐ NO [√]

Remarks by Chairman, UG BOS, if any

UG BOS Meeting Reference Number: Date:

TEMPLATE FOR COURSE SYLLABUS FOR NEP IMPLEMENTATION

Course Code: UCMSMIN30003

Course Name: DIGITAL ELECTRONICS

Brief Course Description:

This course deals with the basic concepts of Digital computers and digital logic, it gives us an overview of the internal structure and working of a digital computer and its building blocks. The logic behind the working of each component is explained in this subject.

Prerequisite(s) and/or Note(s):

Students interested in this course should have had an exposure to basic high school mathematics.

Course Objectives:

The objective of learning Digital Electronics is to have a basic idea about the digital components in a Computer and their working. With the completion of this course students will also be aware of the different representations of numbers and their conversions, Boolean algebra and circuit design.

Knowledge acquired:

1. Basic knowledge of digital logic and digital circuits,
2. Overall idea about how computers function and the internal building blocks of a computer.
3. Knowledge about how operations are performed in a computer
4. A thorough understanding of the fundamental concepts and techniques used in digital electronics.

Skills gained:

1. Application of the knowledge of digital logic to understand digital electronics circuits.
2. The ability to understand, analyze and design various combinational and sequential circuits.
3. To understand and examine the structure of various number systems and its application in digital design.

Competency Developed:

1. Ability to identify basic requirements for a design application and propose a cost effective solution.
2. The ability to identify and prevent various hazards and timing problems in a digital design.
3. Ability and skill to develop/build, and troubleshoot digital circuits.

Detailed Syllabus

3rd Year: Semester 5 or 6

UCMSMIN30003: DIGITAL ELECTRONICS [Credits: 3, Lecture :45]

Unit 1: Number system and codes (10 Lectures)

Binary, octal, hexadecimal and decimal number systems and their inter conversion, BCD numbers (8421-2421), Gray code, excess–3 code, code conversion, ASCII, EBCDIC codes, their advantages and disadvantage, Binary addition and subtraction, Negative number representation: Sign magnitude, 1's, 2's Complement. signed and unsigned binary numbers, Fixed and floating-point representation.

Unit 2: Basic logic circuits (10 Lectures)

Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR and their truth tables,), Universal Gates, Laws of Boolean algebra, De-Morgan's theorem, Min term, Max term, POS, SOP, K-Map for 2, 3, 4 variables, Simplification by Boolean theorems, don't care condition, Venn diagram. SSI, MSI, LSI and VLSI circuits.

Unit 3: Combinational Logic (10 Lectures)

Half adder, Full adder, parallel adder, half subtractor, full subtractor, 4-bit binary adder cum subtractor, Multiplexer, Demultiplexer, Decoder, BCD to seven segment Decoder, Encoders.

Unit 4: Sequential Circuit: (15 Lectures)

Set-reset latches, D-flip-flop, R-S flip-flop, J-K flip-flop, Master slave flip-flop, edge triggered flip-flop, T flip-flop, Synchronous/Asynchronous counter, Up/down synchronous counter, Ripple Counter, Applications of counter, Serial in/Serial out shift register, Parallel in/Serial out shift register, Serial in/parallel out shift register, parallel in/ parallel out shift register, Bi-directional register, Applications of register.

Suggested Readings:

1. M. Morris Mano, Digital Logic and Computer Design,Pearson Publication
2. Rajaraman V. & Radhakrishnan, An Introduction to Digital Computer Design, PHI.
3. Malvino & Leach, Digital Principles & Applications, TMH
4. S. Salivahanan, S. Arivazhagan, Digital Circuits and Design, Oxford University Press

UCMSMIN30003: DIGITAL ELECTRONICS TUTORIAL [Credits:1, Tutorial Hours: 30]

Digital Electronics tutorial as assigned and advised by teacher(s)