VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY
JNANASAGARA CAMPUS, BALLARI-583105

Department of Studies in Electronics

IV Semester Syllabus

Bachelor of Science

With effect from 2022-23 and onwards

Name of the Department: Electronics

Semester-IV

DSC 4: Digital Electronics and C-Programming

Course Title: Digital Electronics and C-Programming	**Course code: :** 21BSC4C4ELL
Total Contact Hours: 55	**Course Credits: 04**
Internal Assessment Marks: 40 marks	**Duration of SEE: 02 Hours**
Semester End Examination Marks: 60 marks	

Course Outcomes (CO's):

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

1. Describe the Digital Electronics and its Fundamentals.
2. Distinguish the characteristics of Analog and Digital Electronics.
3. Solve the problems using the different theorems and digital methods.
4. Describe the performance of Digital Electronics by cominational circuits.
5. Write simple C-programs.

DSC 4: Digital Electronics and C-Programming

Unit	Description	Hours
1	**Number Systems** Binary, Octal & Hexadecimal systems and their inter conversions. Codes- BCD (8421), Excess- 3 code, Gray code, Binary operations- addition, subtraction, 1' & 2' complementary method of subtraction. Examples. BOOLEAN ALGEBRA: positive, negative logics, Boolean identities. Laws and Theorems of Boolean algebra.	11
2	**Logic Gates & Logic** Introduction, AND, OR, NOT – Basic gates: construction, working using diodes and transistors. Truth tables, symbols and IC's. Universal gates: NAND & NOR gates truth tables, symbols & Boolean expressions. Combinational gates: XOR & XNOR gates truth tables, symbols & Boolean expressions. Demorgan's theorems. Simplifications of Boolean expressions using laws & theorems. Binary adder: Half adder & Full adder, 4-bit Binary adders.	11
3	**Module 3: Combinational Logic** Multiplexers: block diagram, truth table and logic circuit of 4-to-1 multiplexer and 16 to-1multiplexer .The 74150 TTL multiplexer-pin out diagram, truth table explanation Demultiplexer-1-to4, 1-to-16 demultiplexer block diagram, truth table and	11

	logic diagram and explanation. The 74154demultiplexer-pin out diagram, truth table explanation Implementation of logic circuits for given Boolean expressions and design. Simplifying the logic circuits SOP & POS expressions, K-Map construction & simplifications to solve 3 & 4 variable Boolean expressions, don't care conditions .	
4	**LOGIC family IC's & Flip-flops** RT, DTL & TTL families – characteristics, TTL NAND & NOR gates, CMOS series, Merits and demerits of TTL & CMOS. **Flip-flops:** Basic RS flipflop (bistable) using transistor. Flipflop as a memory cell. RS- NAND & NOR latches, clocked RS flipflop, D & T flipflop, JK flipflop, master slave flipflop. relaxation oscillator.	11
5	**'C' PROGRRAMING & STATEMENTS OF 'C' LANGUAGE** Basic computer system- block diagram &function,Introduction to 'C' language, characteristics and applications, character set, C- tokens,constants and variables, data types, operators- arithmetic, logical, bitwise and special operators, Expressions, Basic structure of 'C' programming, compiling and executing of 'C' programs Statement and examples with programs for the following- Conditional control statements: 1) if statement. 2) If-else statement. 3) nested-if statement. 4) switch statement. Unconditional control statements: 5) go-to statement. Loop control statements: 6) while statement. 7) do while statement. 8) for statement. 9) nested for statement. 10) jump statements	11

Reference Books:

1. Modern Digital Electronics – RP Jain
2. Digital Principles & applications – AP Malvino
3. Digital fundamentals - Flyod
4. Digital system –principles & application; Ronald J Tocci
5. Electronic devices & circuits, Jacob Millman & Halkias
6. Digital principles & applications ; Malvino&Leach
7. Computer concept & 'C' programming - P.B.Kotur.

Name of the Department: Electronics

Semester-IV

DSC 4: Digital Electronics and C-Programming Lab

Course Title: Digital Electronics and C-Programming Lab	**Course code:** 21BSC4C4ELP
Total Contact Hours: 56	**Course Credits: 02**
Internal Assessment Marks: 25	**Duration of SEE: 03 Hours**
Semester End Examination Marks: 25	

Course Outcomes (CO's):

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

1. Observe Digital signals and their behaviour.
2. Use the instruments like IC's and design Different combinational circuits.
3. Design experiments to verify D-Morgan's theorems.
4. Design experiments to draw the different Digital circuits and Expressions.

DSC 4: Digital Electronics and C-Programming Lab

List of Experiments:

1) Construction of Basic logic gates using diodes and transistor.
2) Verification of IC – logic gates OR(7432), AND(7408), NOT(7404), NAND (7400), NOR (7402), X-OR (7486).
3) Verification of De' Morgan's theorems.
4) Realization of basic gates using universal gate –NOR
5) Realization of basic gates using universal gate –NAND
6) Construction of NAND, NOR latches.
7) Construction of RS flip-flop.
8) Construction of JK flip-flop.
9) Study of Multiplexer and using IC 74LS150.
10) Study of Demultiplexer using IC 74LS15.

C- programs:

1) Program to find the Simple interest and Compound interest.

2) Program to find the Smallest and largest of three given numbers.
3) Program to find the sum of Sine Series.
4) Program to find the sum of individual digits of given number.
5) Program to check prime number.
6) Program to print the Fibonacci Series.
7) Program to find the roots of Quadratic equation using switch statement.

Note:

1. Minimum of EIGHT experiments must be carried out.
2. Experiments may be added as and when required with the approval of BoS.

References:

1. Modern Digital Electronics – RP Jain
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