SantGadgeBabaAmravatiUniversity,Amravati

NameoftheProgramme:-M.Sc. **Subject**:ElectronicsScience

ProgrammeSpecificOutcome(PSO)

Nameofthecourse(Paper):4ELE**1(M.Sc.IISemesterIV) (NEP-2020)**

Course outcome

After competing the course student will be able to,

1.VHDL programming and VLSI Design

2.Student must be able to design CMOS system

3.Simulationtechnique,Behaviour modeling, sequential Processing

4. Design of combinational blocks of ALU, MUX, DEMUX

DSCI.4 : VLSI Design and VHDL Programming

UNIT-I : Introduction to CMOS / VLSI Circuits, MOS transistor switch, Realization of universal gates and compound gates using MOS transistors, Fundamentals of circuit characterization and performance estimation, Basics of R, L and C estimation, CMOS circuits and Logic design, Transistor sizing, basic physical design of simple logic gates.

UNIT II :CMOS system design And Design Methods, CMOS testing, CMOS subsystem design, Floor planning, Placement ,Physical design flow, Information Formats, Global Routing, Detailed Routing, Special Routing.

ASIC construction And CMOS Design:-Physical design, CAD tools.

UNIT III : Introduction to VHDL, BehavioralModeling, sequential Processing, data types, attributes, configurations, synthesis and synthesis issues, RTL simulation, place and route. Introduction to VERILOG.

UNIT IV : Design of combinational blocks such as multibit address, ALU, MUX, DEMUX , encoders, decoders, Design of Sequential circuits, asynchronous and synchronous design Issues

Recommended Books :

1) Neil Weste - K. Eshraghian : Principle of CMOS / VLSI Design (Person Education).

2) J. Bhaskar : "VHDL Primer", (Person Education)

3) Douglas L. Perry : VHDL (3rd Ed.) , McGraw Hill

PRACTICALS based on above theory

DSC II.4 Virtual Instrumentation

Unit I : Virtual Instrumentation Traditional bench top instruments, general functional description of a digital instrument, block diagram of a virtual instrument, user interface, advantages of virtual instrument over conventional instruments, architecture of a virtual instrument & its relation to the operating system, data flow techniques, other virtual programming environments ,Virtual Instrument Programming Techniques VIs and sub VIs .

Unit II : Data Acquisition Basics Introduction to data acquisition on PC, concepts of data acquisition and terminology, sampling fundamentals, I/O techniques and buses, ADC, DAC, digital I/O, counters and timers, DMA, buffered I/O, real time data acquisition, calibration,
resolution, data acquisition interface requirements.

Unit III : Virtual Instrument Chassis Requirements Common instrument interface: Current loop, RS232/RS485, GPIB systems basics; interface basics: USB, PCMCIA, VXI, SCXI, PXI, Firewire; PXI system controllers; Ethernet control of PXI.

Unit IV : Virtual Instrument Analysis Tool sets Distributed I/O modules, Applications of VI, Instrument control, simulations of systems, Fourier Transform, power spectrum, correlation methods, windowing & filtering, P, PI, and PID module handling, virtual system design in temperature, pressure, humidity, image acquisition and processing, motion control, database programming.

Recommended Books:

1. Virtual Instrumentation using Lab VIEW : Sanjay Gupta and Joseph John (TMH, New Delhi, 1st edition, 2005)
2. Virtual Instrumentation using Lab VIEW :Jovitha Jerome (PHI Learning Pvt. Ltd., New Delhi, 2007)
3. Lab VIEW for Everyone: Lisa K. Wells & Jeffrey Travis (Prentice Hall, New Jersey, 1997)
4. Lab VIEW Graphical Programming: Gary Johnson (Second edition MGH, New York, 1997)
5. Lab VIEW for Data Acquisition: Bruce Mihura (PHI, New Delhi)

PRACTICALS based on above theory

DSC III.4

After competing the course student will learn ,

1.various interface viz.RS232/RS485,GPIB,USB etc.
2.structure of C programme, programming style, executing C programme.
3.complete programming skills.

C Programming

Unit I : Basic structure of C programme, programming style, executing C programme, constants, variables & data types, operators, I/P and O/P operations, Branching & looping.

Unit II : Arrays : One dimensional, two dimensional , multidimensional , their declaration & initialization. Character &Strings : Declaring & initializing string variables , reading & writing of string variables, arithmetic operations on characters, comparison of strings. User-defined function : Need, definition, return values & their types, function calls, declaration, nesting of functions, passing arrays & string to function .

Unit III : Structures , Definition , declaration initialization , copying and comparing structure variable ,arrays of structure, structures and functions, size of structures. Pointers : Introduction , accessing the address of variables , initialization of pointer variables , chain of pointer, pointer expression , pointers & arrays , pointers & character strings , pointer to function & structure File management in C .

Recommended Books :
1) E. Balguruswami :ANCII C
2) YashwantKanetkar : C programming

PRACTICALS based on above theory

DSE IV.4 -Fuzzy logic and Neural Networks

After completion of the course student will be,
Aableto knowUtility of Fuzzy systems,neuralnetwork,classical logic ,interface,fuzzy system simulation etc.

-Fuzzy logic and Neural Networks

Unit I : Introduction: Utility of Fuzzy systems, uncertainty and information, fuzzy sets and Membership, chance versus fuzziness. Classical set and fuzzy sets: Classical set, operation on classical set, properties of classical set, fuzzyset, fuzzy set operation, properties of fuzzy sets, non interactive fuzzy sets. Classical Relation and Fuzzy relation: Cartesian product, crisp relation, operation on crisp relation, properties of crisp relations, operation on fuzzy relations, properties of fuzzy relation

Unit II : Properties of membership function, Fuzzification&Defuzzification: Features of the membership function, fuzzification, defuzzification to crisp set. Logic & Fuzzy Systems: Classical Logic, Fuzzy Logic, Fuzzy(rule-based) systems, graphical techniques of inference. Development of membership function: Membership value assignment, membership function generation.

Unit III : Fuzzy Systems simulation: introduction, fuzzy relational equations, non-linear simulation using fuzzy systems, Fuzzy Associative Memories (FAMs). Rule-Base reduction methods: Fuzzy systems theory and rule reduction methods. Decision making with fuzzy information: introduction, fuzzy synthetic evaluation, fuzzy ordering, non transitive ranking, preferences and consensus, multiobjective decision making, fuzzy Bayesian decision making, decision making under fuzzy states and fuzzy actions.

Recommended Books:
1. Fuzzy Logic with Engineering Applications, 2e. Timothy Ross, Wiley India. (ISBN: 978-81-265-1337-3)
2. Fuzzy sets and Fuzzy Logic Theory and Applications, George J. Klir, Bo Yuan, PHI (ISBN: 978-81-203-11367)
3. Neural Networks and Fuzzy systems, Bart Kosko, PHI(ISBN: 81- 203-0868-9)

PRACTICALS based on above theory

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