INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DEVI AHILYA UNIVERSITY, INDORE

MCA (6 Years)

XI SEMESTER

JULY-DECEMBER 2012

Sub. Code	Sub. Name	Credit
IC-1105	VLSI Design	4
IC-1107	Research in Computing	4
IC-1108	Mobile & Wireless Computing	4
IC-1109	Data Mining & Warehousing	4
IC-1104	Comprehensive Viva	4

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE
MCA (6 Years) XI SEMESTER
IC-1101: VLSI Design

Aim of Course:- Aim of Course: The course is designed to give the student an understanding of the different design steps required to carry out a complete digital VLSI (Very-Large-Scale Integration) design in silicon.

Objectives:
The course is designed to make students:
- Understand and Experience VLSI Design Flow
- Learn Transistor-Level CMOS Logic Design
- Understand VLSI Fabrication and Experience CMOS
- Visualize CMOS Digital Chip Design.

Course Contents:

UNIT I
Overview: Overview of VLSI design methodology, VLSI design flow, design hierarchy, CAD tools at various design levels, concept of regularity, modularity and locality, VLSI design styles, design quality, packaging technology.

UNIT II
Introduction to CMOS technology: MOS Transistors, MOS transistors as switches, CMOS Logic, MOS transistor theory-introduction, MOS device design equations, Complementary CMOS inverter-DC characteristic.

UNIT III
Circuit characterization: Switching characterization: Rise time, Fall time and Delay time. Power dissipation:- Static dissipation, Dynamic dissipation, Short-circuit dissipation, Total power dissipation, Power economy.

UNIT IV
VLSI Technology: Crystal growth and wafer preparation-introduction, Electronic grade silicon, Lithography-Photomasking process, Ten-step process, X-ray exposure system, Electron beam exposure system.

UNIT V
VHDL & Introduction to PLDs: Introduction to VHDL, Levels of abstraction, Basic building blocks, Language elements, Concurrent statements, Sequential statements, Structural modeling, Simulation concept, Synthesis concept and test bench. PLD architecture, Xilinx, CPLD & FPGA architecture, Comparison of CPLD and FPGA. Xilinx development tools.

Reference Books:
1. Neil H.E. Waste, Kamran Eshraghian : Principles of CMOS VLSI design, Pearson Education, 2e.
2. Sung-Mo-Kang, Yusuf Leblebici: CMOS Digital Integrated Circuits Analysis and Design, TMH 3e.
3. Peter Van Zant: Microchip fabrication, Mc-Graw Hill, 4e
4. S.M. Sze : VLSI Technology
5. David Pellerin, Michael Holley: Practical design using programmable Logic, Prentice Hall.
6. J.Bhaskar: VHDL Premier

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IC-1102: Mobile & Wireless Computing

Aim of Course: To familiarize students with recent wireless technology, working of wireless systems, mobility supported, and infrastructure for mobile systems.
Objectives:

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Objectives:
The course is designed to make students:
- Introduction to communication systems & their applications.
- Understanding of Wireless transmission techniques, infrastructure and devices.
- Understanding mobile network and mobile wireless LAN.
- Concepts of video broadcasting, Wireless LAN topologies

Course Contents:
UNIT I
Introduction to wireless, Cellular, Digital, PCS mobile radio, Wireless transmission- signal, Antennas, signal propagation. Multiplexing -SDM, FDM, TDM, CDM. Modulation –ASK, FSK,PSK, MSK,QPSK,MCM. Spread spectrum- DSSS, FHSS. Cellular Systems.

UNIT II
Media Access Control-SDMA,FDMA,TDMA,DAMA,PRMA,MACA,CDMA- SAMA Comparison of S/T/F/CDMA. Telecom System – GSM(System architecture, radio interface, protocols, handover), DECT(System architecture, protocol architecture)

UNIT III
Satellite System- Applications, Basics, GEO, LEO, routing, localization, Handover. Broadcast System Wireless LAN- Infrared Vs radio transmission, Infrastructure and ad hoc network. IEEE802-11, Blue tooth, Ad hoc Network

UNIT IV
Mobile Network layer: Mobile IP- Goals, Assumptions and requirements, IP packet delivery, Agent discovery, Registration, Tunneling and encapsulation, optimizations, reverse tunneling, Ipv6 DHCP(Dynamic host configuration protocol)
Mobile ad-hoc networks- Routing, Destination sequence distance vector routing, alternative metrics.
UNIT V
Mobile Transport layer- Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective transmission, Transaction oriented TCP.
Support for mobility- file system, World wide web, Wireless application protocol.

Reference Books:
1. J. Schiller, Mobile Communication, Addision Wiley
2. William C.Y. Lee, Mobile Comm. Design Fundamental. John wiley.
3. Dr. Kamilo Feher, Wireless Digital Communication, PHI.
4. Mark Ceampa, Design & Implementation of Wireless LANs, Thomson Learning.

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IC-1109: Data Mining & Data Warehousing

Aim of Course: To understand data warehouses and data Mining with recent trends and development and trends in the field.

Objectives:

The course is designed to make students:
- Understand basic concepts of data warehousing and data mining.
- To make students understand On Line Analytical Processing (OLAP)
- To learn data mining techniques and understand various algorithms.
- To get familiarize with data mining tools and ETL tools.

Course Contents:

UNIT I

Data Warehouse, Evolution, Definition, Very large database, Application, Multidimensional Data Model, OLTP V/s Data Warehouse, Warehouse Schema, Data Warehouse Architecture. Data Warehouse Server, Data Warehouse Implementation, Metadata, Data Warehouse Backend Process: Data Extraction, Data Cleaning, Data Transformation, Data Reduction, Data loading and refreshing. ETL and Data warehouse, Metadata.

UNIT II

Structuring/Modeling Issues, Derived Data, Schema Design, Dimension Tables, Fact Table, Star Schema, Snowflake schema, Fact Constellation, De-normalization, Data Partitioning, Data Warehouse and Data Marts. OLAP, Strengths of OLAP, OLTP V/s OLAP, Multidimensional Data, Slicing and Dicing, Roll-up and Drill Down, OLAP queries, Successful Warehouse, Data Warehouse Pitfalls, DW and OLAP Research Issues, Tools.

UNIT III

Fundamentals of data mining, Data Mining definitions, KDD V/s Data Mining, Data Mining Functionalities, From Data Warehousing to Data Mining, DBMS V/s DM, Issues and challenges in Data Mining. Data Mining Primitives, Data Mining Query Languages. Data Mining applications-Case studies.

UNIT IV

Association rules: Methods to discover association rules. Various algorithms to discover association rules like A Priori, partition, Pincer search, Dynamic Itemset Counting Algorithm etc.

UNIT V

Decision Trees, Web Mining, Web content mining, Web Structure mining, Text mining, Temporal Mining and Spatial Data Mining.

Reference Books:

1. ARUN K PUJARI, Data Mining Techniques, University Press
2. JIAWEI HAN & MICHELINE KAMBER, Data Mining – Concepts and Techniques, Harcourt India
3. W. H. Inmon, Building the Data Warehouse, Wiley Dreamtech India Pvt. Ltd
4. RALPH KIMBALL, The Data Warehouse Life cycle Tool kit,WILEY STUDENT EDITION