M.Tech (Electronics and Telecommunication Engineering) Syllabus for Admission Batch 2016-17 2^{nd} Semester

VLSI PHYSICAL DESIGN

MODULE – I

VLSI Physical Design Automation: VLSI Design Cycle, Physical Design Cycle, Design Styles, System Packaging Styles, Historical Perspectives, Existing Design Tools Design and Fabrication of VLSI Devices: Fabrication Materials, Transistor Fundamentals, Fabrication of VLSI Circuits, Design Rules, Layout of Basic Devices Fabrication Process and its Impact on Physical Design: Scaling Methods, Status of Fabrication Process, Issues Related to the Fabrication Process, Future of Fabrication Process, Solutions for Interconnect Issues, Tools for Process Development.

MODULE – II

Data Structure and Basic Algorithms: Basic Terminology, Complexity Issues and NP-hardness, Basic Algorithms, Basic Data Structures, Graph Algorithm for Physical Design Partitioning: Problem Formulation, Classification of Partitioning Algorithms, Group Migration Algorithm, Simulated Annealing and Evolution, Other Partitioning Algorithms, Performance Driven Partitioning Floor Planning and Pin assignment: Floor Planning, Chip Planning, Pin Assignment, Integrated Approach

MODULE – III

Placement: Problem Formulation, Classification of Placement Algorithms, Simulation Based Placement Algorithms, Partitioning Based Placement Algorithms, Other Placement Algorithms, Performance Driven Placement Over-the-Cell Routing and Via Minimisation,

MODULE – IV

Clock and Power Routing: Over-the-Cell Routing, Via Minimisation, Clock Routing, Power and Ground Routing Physical Design Automation of FPGAs: FPGA Technologies, Physical Design Cycle for FPGAs, Partitioning, Routing Physical Design Automation of MCMs: MCM Technologies, MCM Physical Design Cycle, Partitioning, Placement, Routing.

Text Books:

- Naved A. Sherwani, Algorithms for VLSI Physical Design Automation, 3rd Edn., Springer (India) Pvt. Ltd., 2005, ISBN: 0792383931
- Gerez, Algorithms for VLSI Design Automation, Wiley India Pvt. Ltd., New Delhi, ISBN 10: 8126508211, ISBN 13: – 9788126508211.

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