

CS6009 NANO COMPUTING

DETAILED SYLLABUS

OBJECTIVES:

The student should be made to:

- Learn nano computing challenges.
- Be familiar with the imperfections.
- Be exposed to reliability evaluation strategies.
- Learn nano scale quantum computing.
- Understand Molecular Computing and Optimal Computing.

UNIT I NANOCOMPUTING-PROSPECTS AND CHALLENGES

Introduction - History of Computing - Nanocomputing - Quantum Computers – Nanocomputing Technologies - Nano Information Processing - Prospects and Challenges - Physics of Nanocomputing: Digital Signals and Gates - Silicon Nanoelectronics - Carbon Nanotube Electronics – Carbon Nanotube Field-effect Transistors – Nanolithography.

UNIT II NANOCOMPUTING WITH IMPERFECTIONS

Introduction - Nanocomputing in the Presence of Defects and Faults - Defect Tolerance – Towards Quadrillion Transistor Logic Systems.

UNIT III RELIABILITY OF NANOCOMPUTING

Markov Random Fields - Reliability Evaluation Strategies - NANOLAB - NANOPRISM – Reliable Manufacturing and Behavior from Law of Large Numbers.

UNIT IV NANOSCALE QUANTUM COMPUTING

Quantum Computers - Hardware Challenges to Large Quantum Computers - Fabrication, Test, and Architectural Challenges - Quantum-dot Cellular Automata (QCA) - Computing with QCA – QCA Clocking - QCA Design Rules.

UNIT V QCADESIGNER SOFTWARE AND QCA IMPLEMENTATION

Basic QCA Circuits using QCA Designer - QCA Implementation - Molecular and Optical Computing: Molecular Computing - Optimal Computing - Ultrafast Pulse Shaping and Tb/sec Data Speeds.

TEXT BOOK:

1. Sahni V. and Goswami D., Nano Computing, McGraw Hill Education Asia Ltd. (2008), ISBN (13): 978007024892.

REFERNCES:

1. Sandeep K. Shukla and R. Iris Bahar., Nano, Quantum and Molecular Computing, Kluwer Academic Publishers 2004, ISBN: 1402080670.

Diploma, Anna Univ UG & PG Courses

Notes

Syllabus

Question Papers

Results and Many more...

Available @

www.AllAbtEngg.com

2. Sahni V, Quantum Computing, McGraw Hill Education Asia Ltd. 2007.

3. Jean-Baptiste Waldner, Nano computers and Swarm Intelligence, John Wiley & Sons, Inc. 2008, ISBN (13): 978-1848210097.