Additional Courses for inclusion
at the Semester III of M.Sc. Electronic Science (Department)
(Credit System)

EL-313: Advanced VLSI Design


Reference/Text Books

4. R. Jacob Baker, CMOS Mixed-Signal Circuit Design, Wiley
5. Daniel Foty, MOSFET Modeling with SPICE, Prentice Hall
7. Gordon W. Roberts and Adel S. Sedra, SPICE, Oxford University
8. Rabaey, Chandrakasan, and Nikolic, Digital Integrated Circuits, A Design Perspective
9. Weste and Harris CMOS VLSI Design
EL-314: Foundation Course in IC Layout Design

Credits: 4


Concepts of analog layout-Sharing, Fingering, Matching, Shielding & crosstalk, Second order & Short channel effects, Issues to take care in analog layout- Latch up, Antenna effect, Electro migration, Electrostatic discharge, Antenna issue, Latch up theory & prevention, High Voltage circuit theory, I/O circuit, Noise and ground bounce theories, Strapping and Guard-ring techniques


Introduction to Cadence virtuoso-Basic commands, Bind keys, Layout related functions, Layout vs layout, Layout design & verification-Floor planning- hierarchical design, Power planning, Pin placement, Understanding Design rules, DRC / LVS with ASSURA, Assignments- P - cells creation, Simple inverter, D – flip flop, Custom digital layout, Current mirrors/ buffers/ differential pair, Two stage differential amplifier, High current switches, Resistor/Capacitor dividers, “Layout design & verification of LDO”.

Reference/Text Books
3. Baker, Li Boyce, CMOS Circuit Design, Layout and Simulation
4. M.J.S. Smith, Application Specific Integrated Circuits, Addison-Wesley
5. S. Kang and Yusuf Leblebici,
7. H. E. Weste and David Harris, Principles of CMOS VLSI Design, Addison Wesley
8. Dan Clein, Newnes, CMOS IC Layout,

**EL-361: Foundation Course in IPR**

Credits: 2


Need for Patent, Patentable and Non-Patentable Invention, Types of Patent application in India, PCT System, Guidelines for Registration of Patent, Patent filing, Opposition and Grant

**Reference/Text Books**

1. Deborah E. Bouchoux Intellectual Property for Paralegals Cengage Learning
EL-361: Foundation Course in Design IPR Management  
Credits: 2

Concept of design, Design Act 2000, Need for protection of design, Concept, Purpose, Characteristics and functions of Trademark, Copyright and Geographical Indications, Concept of Copyright, Works Protected and Not Protected by Copyright, Copyright in Digital era, Concept of Geographical Indications, IPR Management, IPR Audit, Range and Classification of IP Services

IPR Regime, Principles of IP Management, Sectoral IPR Debates on IPR and Development, IPRs and technology transfer, IPRs vis-à-vis access & affordability of medicines, Traditional knowledge, IPR and Benefit sharing, Indigenous knowledge and its appropriation

IPR in Semiconductor IC Layout Design, Concept of Integrated Circuit Layout design, Registration of Integrated Circuit Layout design, Semiconductor Chip Protection Copyrights, design registration, design protection, licensing, IP reuse.

Reference/Text Books
1. Intellectual property rights for engineers, 2nd edition, by V. Irish, Published by The IEE,