GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. (Branch-42-VLSI System Design)

TEACHING SCHEME (SEMESTER-IV) W.E.F. January, 2013

Subject Code	NAME OF SUBJECT	TEACHING SCHEME(HOURS)			**CREDITS**
		THEORY	TUTORIAL	PRACTICAL	
744201	Silicon on Insulator	4	2	0	5
740001	Mid semester Thesis Progress Review	-	-	-	5
740002	Dissertation Phase-II	0	0	24	10
	Total	4	2	24	20

GUJARAT TECHNOLOGICAL UNIVERSITY
Master of Engineering (VLSI System Design)
Semester – IV

Subject Code: 744201

Subject Name: Silicon on Insulator

Sr. No.	Course Content
1	**Introduction:** Evolution of CMOS VLSI, SOI versus bulk, Low-Voltage SOI VLSI.
2	**Basic SOI Technology:** Introduction, Back gate bias effect, Short channel effect, Narrow channel effect, Floating body effects, Sub threshold behavior, History effect.
3	**SOI CMOS Devices:** Hot carrier, Accumulation-Mode Devices, Double Gate, DTMOS, Scaling Trends, Single Electron Transistor (SET), Electrostatic Discharge (ESD).
4	**Fundamentals of SOI CMOS Circuits:** Basic Issues, Low-Voltage circuit techniques, MTCMOS Circuits, Noise, Self heating, System-on-Chip (SOC) Techniques.
5	**SOI CMOS Digital Circuits:** Static Logic Circuit, Dynamic Logic Circuit, DRAM, SRAM, Gate Array.
6	**SOI CMOS Analog Circuits:** SOI Op Amps, Filters, ADC and DAC, Low voltage amplifier (LNA), Voltage controlled oscillator (VCO).

Text/References

1. James B. Kuo, Shih-Chia Lin , Low-voltage SOI CMOS VLSI Devices and Circuits, Wiley Publisher, ISBN: 978-0-471-41777-4.
2. Jean-Pierre Colinge, Silicon-on-Insulator Technology: Materials to VLSI, Kluwer Academic Publisher, ISBN 978-1-4020-7773-9.
3. Kerry Bernstein, Norman J. Rohrer, SOI-Circuit Design Concepts, Kluwer Academic Publisher, ISBN 978-0-7923-7762-7.
4. Andrew Marshall, Sreedhar Natarajan , SOI-Design: Analog, Memory and Digital Techniques, Kluwer Academic Publisher, ISBN 978-0-7923-7640-8.