18ECPE805	SYSTEM ON CHIP DESIGN	L	T	P	C
		3	0	0	3

Course Objectives:

1.	To know the Concepts and methodology of System on chip.
2.	To design different methodology for logic cores, memory cores and analog cores.
3.	Learn design validation and SOC testing.

Unit I	INTRODUCTION	9	+	0

System trade offs and evolution of ASIC Technology – System on chip concepts and methodology – SoC design issues – SoC challenges and components.

Unit II	DESIGN METHODOLOGY FOR LOGIC CORES	9	+	0

SoC Design Flow – On-chip buses – Design process for hard cores – Soft and firm cores – Designing with hard cores, soft cores – Core and SoC design examples.

Unit III	DESIGN METHODOLOGY FOR MEMORY AND ANALOG CORES	9	+	0

Embedded memories – Simulation modes – Specification of analog circuits – A to D converter – D to A converter – Phase-located loops – High speed I/O

Unit IV	DESIGN VALIDATION	9	+	0

Core level validation – Test benches- SoC design validation – Cosimulation – Hardware/software co-verification.

Unit V	SOC TESTING	9	+	0

SoC Test issues – Testing of digital logic cores – Cores with boundary scan – Test methodology for design resuse – Testing of microprocessor cores – Built in self test method.

Total (L+T)= 45 Periods

Course Outcomes:

Upon completion of this course, the students will be able to:

CO1	:	Understand the Concepts and methodology of System on chip.
CO2	:	Design different methodology for logic cores, memory cores and analog cores.
CO3	:	Design SOC validation
CO4	:	Test different logic cores.

Text Books:

1.	RochitRajsuman, "System-on-a-chip: Design and Test", Artech House, London, 2000.
2.	Laung-Terng Wang, Charles E Stroud and Nur A Toubq, "System on Chip Test Architectures: Nanometer Design for Testability", Morgan Kaufmann, 2008

Reference Books:

1.	WgelBadawy, Graham A Jullien, "System-on-Chip for Real-Time Applications", Kluwer Academic Press, 2003.
2.	Rajanish K Kamat, Santosh A Shinde, Vinod G Shelake, "Unleesh the System-on-Chip using FPGAs and Handle C, Spinger 2009.
3.	Steve Furber, "ARM System on Chip Architecture", 2nd Edition, Addison- Wesley Professional , Aug 2000
4.	Ricardo Reis, "Design of System on a Chip: Devices and Components" Springer 1st Edition, July 2004

E-References:

1.	https://nptel.ac.in/courses/108102045/10
2.	https://freevideolectures.com/course/2341/embedded-systems/10
3.	https://www.elprocus.com/difference-between-soc-system-on-chip-single-board-computer/