COURSE CODE: System Level Specification and Design

Programme: B.Tech. (ECE, CSE, CCE)   Year: 4th   Semester : II
Course : Open Elective   Credits :4   Hours : 40

Course Context and Overview (100 words):

The emergence of the system-on-chip (SoC) era is creating many new challenges at all stages of the design process. At the systems level, engineers are reconsidering how designs are specified, partitioned and verified. Today, with systems and software engineers programming in C/C++ and their hardware counterparts working in hardware description languages such as VHDL and Verilog, problems arising from the use of different design languages, incompatible tools and fragmented tool flows are becoming common. This course aims at understanding the modeling and design aspects of digital systems.

Prerequisites Courses:

Course outcomes (COs):

On completion of this course, the students will have
CO1:knowledge of different types of system models and architectures
CO2 detailed knowledge of a digital system with implementation modules.
CO3 the knowledge of different partitioning techniques for system design
CO4 understand the quality metrics for system estimation
CO5 ability to translate one system into another.

Course Topics:

Topics	Lecture Hours	
UNIT - I 1. **Introduction**	**3**	
1.1 Design Methodologies	1	
1.2 Level of abstraction. 1.3	1	
1.4 Design architectures	1	
UNIT - II 2. **Models and Architectures**	**10**	
2.1 Capture and simulate	2	
2.2 Describe and synthesize	4	
2.3 Specify and explore	4	

UNIT - III 　3.　**System Translation**	**10**	
3.1 State Machine Translation	2	
3.2 Fork Join Translation	4	
3.3 Exception Translation	4	
UNIT - IV 　4.　**System Partitioning**	**9**	
4.1　Structural Vs Functional	1	
4.2 Natural Vs Executable	2	
4.3 Partitioning issues	2	
4.4 Hardware/Software partitioning	2	
4.5 Partitioning techniques	2	
UNIT-V 　5.　**Estimation**	**8**	
5.1 Accuracy vs speed	3	
5.2 Fidelity	3	
5.3 Quality metrices		

Textbook references (IEEE format):
Text Book:
[1] Gajski, Daniel D., Frank Vahid, Sanjiv Narayan, and Jie Gong. "Specification and Design of Embedded Systems." (1994).
[2] Gajski, Daniel D., and Jon Kleinsmith. Principles of digital design. Vol. 42. New York: Prentice Hall, 1997.

Reference books:
Additional Resources (Web resources etc.):

Evaluation Methods:

Item	Weightage
Quiz	20
Assignment	10
Midterm	30
Final Examination	40

Prepared By:
Last Update: 13/04/2015