Course Structure

Course Code : **SM7310**

Course Title : **System Modeling and Simulation**

Credit Hours : **3**

Course Description

Course Objectives

The student should become acquainted with:

- understand concepts of system, experiment, modeling and simulation
- Overview of the state-of-the-art within modelling of energy systems
- Apply the principles and tools of simulation.
- Design and implement kinds of simulation.

Course Topics

- Classification and Types of Models
- Phases of Modeling Process
- State-space approach to modeling dynamic systems
- State diagrams and solutions of State Equations, Controllability and Observability
- Physical systems modelling
- Mathematical modeling of electrical Systems electromechanical Systems
- Mathematical modeling of mechanical systems
- Dynamic Behavior of Second Order Systems
- Analogous of Linear Systems
- Mathematical Modelling of Liquid Level Systems
- Mathematical Modeling of Pneumatic Systems and Linearization of Nonlinear Systems
- Mathematical Modeling of Hydraulic Systems
- Mathematical Modeling of Thermal Systems
- Time Response analysis of Dynamic Models
- Model Order Reduction

References

- Modeling and Simulation of systems using MATLAB and Simulink, Devendra K. Chaturvedi, CRC Press Taylor & Francis Group,2010.
- System Modeling and Simulation, V. P. Singh, New Age International (P) Ltd., Publishers, 2009.
- Computer Simulation Techniques: The definitive introduction!, Harry Perros, http://www.csc.ncsu.edu/faculty/perros//simulation.pdf, 2009