



**MECHANICAL
ENGINEERING**

Modelling & Simulation of Discrete Event Systems

Type of Course	: New
Course Snapshot	: Elective / PG
Pre-requisites	: Statistics and Probability, Operations Research
Course Duration	: 20 hours / 8 weeks

COURSE OUTLINE:

The course deals with all the important aspects of discrete event system simulation with particular emphasis on applications in manufacturing, services and computing. This course is meant for an upper level undergraduate or master's level introduction to modeling and simulation techniques for discrete event systems.

INSTRUCTOR:

Prof. P. Kumar Jha
Department of Mechanical & Industrial Engineering
IIT Roorkee



ABOUT INSTRUCTOR:

Prof. Pradeep K. Jha is presently working as Associate Professor in the Department of Mechanical & Industrial Engineering at IIT Roorkee. He has taught the course on "Modeling and Simulation" to final year undergraduate, post graduate and Ph.D. students of the Department for five years (a semester every year).

COURSE PLAN:

- Week 1 : Introduction to Simulation, Concept of system, model and simulation, Components of discrete event simulation Advantages and disadvantages of simulation
- Week 2 : Statistical models in simulation, Probability distribution functions, Estimation of statistical parameters
- Week 3 : Characteristic of a queueing system, Simulation of single server queueing system
- Week 4 : Generation of Random number and Random number Variates , Testing of random numbers
- Week 5 : Input modeling: Estimation of parameters, Fit tests of distributions
- Week 6 : Output data analysis for single system: Statistical analysis for terminating and non terminating simulations, Comparing alternative system configurations
- Week 7 : Verification, validation and credibility of simulation models, Simulation of manufacturing and material handling systems
- Week 8 : Monte Carlo simulation, Case studies