

Modeling And Simulations (IT-7002)

Course Code	IT-7002	Credits-4	L – 3, T- 1, P-0
Name of the Course	Modeling and Simulations		
Lectures to be Delivered	52 (1 Hr Each) (L= 39, T = 13 for each semester)		
Semester End Examination	<i>Max. Marks: 100</i>	<i>Min. Pass Marks: 40</i>	Maximum Time: 3hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			<i>Max. Marks: 50</i>

Instructions

- For Paper Setters:** The question paper will consist of five sections A, B, C, D, and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 40% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each section will carry 15% of the total marks of the semester end examination for the course.
- For Candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section – A

Definition of systems: Types of system, continuous and discrete modelling process and definition of a model. Common type of mathematical models used for engineering and non-engineering system (such as differential and partial differential equation models).

Section – B

Simulation Process: Discrete and continuous simulation procedures. Random number generation and its testing discrete and continuous random variables, density and distributive functions, study of few distributions such as Poisson, Norma.

Section – C

Simulation of Queuing System: Elementary idea about networks of queuing with particular emphasis to computer system, environment (refer to sections 9.1, 9.2, & 9.3 of Trivedi's book).

Verification & Validation: Design of simulation experiments and validation of simulation experiments comparing model data units and real system data.

Section – D

Simulation Language: A brief introduction to important discrete and continuous languages such as GPSS (Study & use of the language). Use of data base & AI techniques in the area of modeling and simulation.

Books:

1. Deo, Narsing: System Simulation with Digital Computers.
2. Gordon G: System Simulation, Prentice Hall (Two books above can be used as text books).
3. Shridhar Bhai Trivedi, Kishore: Probability & Statistics with reliability Queuing, Computer science Application.
4. Payer, T.A., Introduction to System Simulation, McGraw Hill.
5. Reitman, J., Modelling and Performance Measurement of Computer System.
6. Spriet, WI A., Computer Aided Modelling and Simulation (Academic Press).