

IM 528 – Discrete Event System Simulation

C O U R S E I N F O R M A T I O N

Course Title: Discrete Event System Simulation.
Code: IM 528.
Hours: Lecture – 2 Hrs. Laboratory – 2 Hrs. Credit – 3.
Prerequisite: IM 423.
Course coordinator's name: Dr. Moataz Ghazy.

G R A D I N G

Class Performance/Attendance:	10%
Midterm # 1/Assignments – (7 th Week):	30%
Midterm # 2/Assignments – (12 th Week):	20%
Final Exam:	40%

C O U R S E D E S C R I P T I O N

This course provides a basic treatment of discrete-event simulation, including the proper collection and analysis of data, the use of analytic techniques, verification and validation of models, and designing simulation experiments. Furthermore, it presents the application of simulation in manufacturing and material handling systems, and service industries.

T E X T B O O K

Jerry Banks, John Carson, Barry L. Nelson, and David Nicol, "Discrete-Event System Simulation", 4th edition, Prentice Hall, 2005.

R E F E R E N C E B O O K S

- Averill Law, "Simulation Modeling and Analysis with Expertfit Software", McGraw-Hill.
- Larry H Leemis and Stephen K. Park, "Discrete-Event Simulation: A First Course", Prentice Hall.
- Stewart Robinson, "Simulation: The Practice of Model Development and Use", John-Wiley & Sons.
- Michael Pidd, "Computer Simulation in Management Science", John-Wiley & Sons.

C O U R S E A I M

The aim of this course is to provide students with the basic knowledge and theoretical background related to modelling and simulation of discrete systems in addition to conducting simulations using spreadsheets.

C O U R S E O B J E C T I V E S

Upon completion of this course the student will be able to:

- Understand the broad applicability of discrete-event process simulation to industrial engineering problems.
- Know the steps required to undertake a successful simulation analysis.
- Learn analytical techniques for interpreting input data and output results pertinent to simulation models.

C O U R S E O U T L I N E

- Week Number 1:* Introduction to Modelling and Simulation
- Week Number 2:* Monte Carlo Simulation of Queuing Models.
- Week Number 3:* Monte Carlo Simulation of Inventory Models.
- Week Number 4:* Monte Carlo Simulation – Other Applications.
- Week Number 5:* General Principles of Discrete Event System Simulation.
- Week Number 6:* Simulation Software.
- Week Number 7:* Queuing Models.
- Week Number 8:* Random-number Generation.
- Week Number 9:* Random-variate Generation.
- Week Number 10:* Input Modelling.
- Week Number 11:* Validation and Verification of Simulation Models.
- Week Number 12:* Output Analysis for a Single Model.
- Week Number 13:* Comparing Multiple Designs.
- Week Number 14:* Simulation of Manufacturing and Material Handling Systems.
- Week Number 15:* Simulation of Service Industries.
- Week Number 16:* Final Exam.

P R O G R A M O U T C O M E S

B, C, E, G, K