

233 CSM Course Syllabus

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| Course Code | 233CSM |
| Course Name | Computer Modelling and Simulation |
| Credit Hours | 3 |
| Contact Hours | 4 |
| Instructor Name | Dr. Manoj Singhal |

Text Book (title, author, and year)

Simulation and Modeling and Analysis, 3rd Edition, Averil M. Law and W. David Kelton

Specific Course Information

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| Catalog Description | This course introduces the students the area of modelling and simulation using Computers. Modelling involves in identifying the parameters that are responsible for the performance of any system and formulating the inter-relations between them. Manipulating the model by changing the parametric values in simulation. Simulation study helps in analyzing the systems of performance and for proposing parametric values for optimum or desired level of performance of the system. A variety of models are introduced and their simulation study is performed in the theory and practical sessions. |
| Prerequisites | NIL |
| Co-requisites | NIL |
| Required/Elective | required |

Course Learning Outcomes

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| 1 | Define the basics of modeling and simulation |
| 2 | Describe inventory and queuing theory models related to simulation |
| 3 | Outline the principle and techniques of simulation models |
| 4 | List out the simulation process for different applications |
| 5 | Develop a model for any kind of system and analyze the behaviour of a system under different conditions |
| 6 | Explain the different simulation models and select the suitable problems for the models |
| 7 | Analyze the students to work in a team |
| 8 | Demonstrate different system models via Computer simulation |

Mapping course LOs to the SLO.

| Course LOs # | Student Learning Outcomes | | | | | | | | | | | | |
|--------------|---------------------------|----|----|----|----|----|----|----|----|----|----|----|--|
| | a1 | a2 | b1 | b2 | b3 | b4 | b5 | c1 | c2 | c3 | d1 | d2 | |
| 1 | ✓ | | | | | | | | | | | | |
| 2 | ✓ | | | | | | | | | | | | |
| 3 | ✓ | | | | | | | | | | | | |
| 4 | | | ✓ | | | | | | | | | | |
| 5 | | | ✓ | | ✓ | | | | | | | | |
| 6 | | | | ✓ | ✓ | | | | | | | | |
| 7 | | | | | | | | ✓ | | | | | |
| 8 | | | | ✓ | | | | | | | | | |

List of Theory Topics

Basics of Simulation and Modeling

Queuing systems: Components of a queuing system, Notation for queuing systems. Simulation of a single server queuing system: Flow chart for arrival and departure events.

Determining events and variables; Simulation of an Inventory system: Flow charts

Continuous Simulation; Combined discrete and continuous simulation; Monte-Carlo Simulation Advantages, disadvantages and Pitfalls of Simulation

Time shared computer model – simulation Multi-teller bank with Jockeying – simulation-Job-shop model – simulation

Simulation software- classification, desirable features