Course Type	Course Code	Name of Course	L	T	P	Credit
DP	NMSC511	Simulation Modeling & Analysis Lab	0	0	3	1.5

Course Objective

In this course, one will be introduced to the foundations of simulation modeling with ARENA software. This will also give you insights on how and when to apply simulation modeling to solve a variety of business-related problems that exist in manufacturing/healthcare/bank/transportation/logistics/supply chain sectors. The course will be taught with
popular software ARENA.

Learning Outcomes

- Knowledge enhancement in simulation modeling & its applications in industries.
- Expertise in developing valid, credible, and appropriately detailed simulation models for solving business application problems.
- Proficiency in ARENA software

Unit	Topics to be Covered	Lectures	Learning Outcome
1.	**Fundamental Simulation Concepts:** System, simulation modeling, Applications, & Challenges.	[6L]	Students will learn the fundamental concepts of simulation modeling, types of simulation models and their challenges.
2.	**A Guided Tour Through Arena:** Arena Window, Elements of simulation model, developing a simple processing system and analyzing its behavior.	[8L]	Students will be exposed to the Arena software and they will develop the simulation model of a simple processing system through Arena software.
3.	**Basic Operations and Inputs:** Developing an electronic assembly & test system, input analysis, selecting Input Probability Distribution, fitting input distributions via input analyzer.	[8L]	Students will learn to find the patterns in the data and appropriately model that data with the best fit distribution.
4.	**Modeling Detailed Operations**: A simple call center system, modeling issues, building the model, system exit and run setup, and detailed output analysis.	[8L]	Students will learn to develop simulation models with different configurations and will analyze its impact on the system performance measures.
5.	**Case Study:** Development of various simulation models such as, specialized serial processing Vs. generalized parallel processing, an inventory system, and a small manufacturing system	[12L]	Students will get to learn the implementation of different types of simulation models for real-life problems using software.
	Total	42L	

References for Reading

Text Books:

1. Law, A. M., Kelton, W. D., & Kelton, W. D. (1991). Simulation modeling and analysis (Vol. 2). New York: McGraw-Hill.
2. Kelton, W. D. (2002). Simulation with ARENA. McGraw-hill.