Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2024-25

Course Handout Part II

06-01-2025

In addition to part-I (General Handout for all courses appended to the timetable), this portion gives further specific details regarding the course.

Instructor-in-charge : **PTV Praveen Kumar**
Instructor : PTV Praveen Kumar, Sunil Rampuria

1. **Scopes and Objective of the Course:**

This course begins with applications overview of Operations Research, and introduces dynamic programming and network models. After a review of probability distributions, inventory models and queuing systems will be covered. Decision- making under certainty, risk, and uncertainty; along with an introduction to game theory will be dealt. Finally simulation techniques, Course No. : **MATH F242**
Course Title : **OPERATIONS RESERACH**

introduction for estimating solutions to problems, that are not amenable to conventional solution techniques, will be made. Students will also be taught the basic concepts on system reliability.

2. Text Book:

1. Hamdy A Taha, "Operations Research: An Introduction", Pearson Education, Tenth Edition, 2018.
2. Venkateswaran S and B. Singh, "Operations Research" EDD Notes.Vol.3, 1997.

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3. Reference Book:

1. Hillier and Lieberman, Bodhibrata Nag, Preetam Basu, "Introduction to Operations Research", T M H, Tenth Edition, 2017.
2. Bernard W. Taylor, "Introduction to Management Science Twelfth Edition, Pearson,2016
3. Anderson, Sweeney and Williams, "Quantitative methods for business Eleventh Edition", Cengage Learning, 2009.
4. Ayyub, B.M. and McCuen R.H., "Probability, Statistics and Reliability for Engineers and Scientists", Chapman & Hall 2e, 2003.

4. Lecture Plan

Lecture Nos.	Learning Objectives	Topics to be Covered	Chapter in the Text Book
1	Introduction to Operations Research	Introduction, Historical Development, Impact of O.R., Phases of O.R., Overview of O.R., Modeling Approach	Chapter 1 (T1)
2-4	Review of Basic	Random variables, Binomial, Poisson,	Chapter 14 (T1) 14.1,14.2,14.3,14.4

	Probability	Exponential and Normal Distribution	
5-13	Introduce Queueing Systems	Definition, Birth and Death process, Role of Exponential Distribution, Generalized Poisson Queueing Models, Specialized Poisson Queues.	Chapter 7 (T2) 7.1,7.2,7.3,7.4,7.5 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.5.5, 7.5.6
14- 20	When to produce / purchase and how much	Deterministic and Probabilistic Inventory Models	Chapter 8 (T2) 8.1,8.2,8.3(Model I, Model II, Model III, Model IV, Model V) 8.4(Model VII, Model VIII)
21-25	How to solve complex system and basic concept of simulation	Introduction, Generation of random variates from different distributions, Simulation of Single-server queueing model and inventory model.	Chapter 9 (T2) 9.1,9.2,9.4,9.4.1,9.4.8,9.8,9.9
26-30	To understand the basic concept of Reliability	Basic concepts, Hazard rate function, Reliability of the systems, failure time distributions.	Chapter 6 (T2) 6.1,6.2,6.3,6.4,6.4.1,6.4.2 6.9,6.9.1,6.9.2
31- 33	Learn about Decision analysis and Game theory	Decision analysis under uncertainty and Game Theory	Chapter 15 (T1) 15.3,15.4,15.4.1,15.4.2
34-36	To understand dynamic programming	Deterministic Dynamic Programming	Chapter 12 (T1) 12.1,12.2,12.3,12.3.1
37-40	Learn basic concepts Network Models	Definition, Shortest route Problem, CPM and PERT	Chapter 6 (T1) 6.1,6.5,6.5.1,6.5.2,6.5.5

5 .Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid-Semester Test	90 min	35	05/03 2.00 - 03.30PM	Open Book
Quizzes	15min (Quizzes will be conducted in either lecture or tutorial classes)	10	**There will be 3 announced Quizzes.** **Out of 3, best 2 will be chosen**.	Closed Book
Assignment 1		10	**TBA**	Open Book
Comprehensive Examination	180 min	45	07/05FN	Closed Book

- Total Marks for the course: 100

6. Chamber consultation hour: To be announced in the class.

7. Notices: The notices concerning this course will be displayed on the LMS Notice Board only.

8. Make-up Policy: Make-up will be given only for very genuine cases and prior permission has to be obtained from the I/C.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

INSTRUCTOR-IN-CHARGE