School of Planning and Architecture: Vijayawada

(An institution of National Importance under the Ministry of Human Resource Development, Govt. of India)
Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India

Department of Architecture

Course: **MBEM113 - Quantitative Methods and Operations Research**
Instructors: Dr. Faiz Ahmed C

Class: I Yr MBEM I Sem A.Y. 2024-25
Internal Assessment: 50
End Exam: 50
Total Marks: 100
Credits: 3

Contact Periods/ Week: 03 periods (2L+1T)
Time Table: Tuesday 1.30 -4:15 PM
Attendance: Min 75% **Min. Passing Marks:** 50% each in Internal & External Assessment, 50% in Aggregate

Objective: To strengthen the quantitative decision-making capability through delivering the analytical scientific approach to Problem solving, quantitative analysis, Operational research models & modelling process for Managerial Decision Making.

LECTURE PLAN

WEEK	TOPIC OF CLASS LECTURE & DISCUSSION	TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS
1	Introductory lecture, discussion on the content of the modules	Lecture/Discussion
2	Measures of Central Tendency & Dispersion, Probability concepts, Bayes Theorem & Applications Probability Distributions Binomial, Poisson, Normal & Exponential,	Lecture/Discussion/Tutorial
3	Sampling & Sampling Distributions, Testing of Hypothesis. Correlation, Regression & Multivariate Analysis, Forecasting methods & Time Series Analysis. Stochastic process introduction.	Lecture/Discussion/Tutorial/Handson Demonstration using SPSS/Excel
4	Decision Trees & Utility Theory, Decision Making under uncertainty, under risk, under certainty & under conflict. Game Theory.	Lecture/Discussion/Tutorial/Handson Demonstration using SPSS/Excel
5	**Assignment I**	**Test I**
6	Linear Programming; graphical, simplex method, dual simplex, Sensitivity Analysis & Duality. Integer Programming. Transportation, Transhipment & Assignment Models.	Lecture/Discussion/Tutorial/Handson Demonstration using SPSS/Excel
7	Linear Goal Programming, Scoring Models, Fuzzy outranking	Lecture/Discussion/Tutorial/Handson Demonstration using SPSS/Excel
8	**MID EXAM**	**Mid Semester Examinations**
9	Introduction to concepts of AHP (Analytic Hierarchy Process} & ANP (Analytic Network Process).	Lecture/Discussion/Tutorial/Handson Demonstration using SPSS/Excel
10	Inventory models (static, dynamic, probabilistic & stochastic), Waiting Line / Queing models steady state operation (M/M/1). Simulation concepts & applications for inventory & Q-ing situations.	Lecture/Discussion/Tutorial
11	Network models; shortest route, maximal flow problem. PERT, CPM	Lecture/Discussion/Tutorial/Handson Demonstration using SPSS/Excel
12	Glimpses of Metaheuristics (Tabu, Simulated Annealing & Genetic algorithm), Markov chains & Decision Processes, Sequencing	Lecture/Discussion/Tutorial
13	Dynamic Programming & Nonlinear Programming (Quadratic & Geometric Programming). Case studies & applications	Lecture/Discussion/Tutorial

14	Dynamic Programming & Nonlinear Programming (Quadratic & Geometric Programming). Case studies & applications	Lecture/Discussion/Tutorial/Handson Demonstration using SPSS/Excel
15	Assessment III	Students Presentation
16	Assessment III	Students Presentation

S. No.	Stages of Evaluation	Weightage
1	First stage: Assessment –1	15
2	Second stage: Mid-semester Examination	20
3	Third stage: Assessment –3	15
	Total	**50**

Suggested Readings:

1. Frederic S.Hillier, Gerald J.Liberman,2005 Introduction to Operations Research, Tata McGraw-Hill
2. Gupta M.P. and R.B. Khanna, 2004, Quantitative Techniques for Decision Making, Prentice Hall of India
3. Natarajan,A.M, Balasuramani.P,Tamilarasi, A2009 Operations Research, Pearson Education
4. Sharma J.K, 2006, Operations Research Theory and Practice, Macmillan India Ltd.
5. Wisniewski MIK, 2004, Quantitative Methods for Decision Makers, Macmillan India Ltd.
6. Rao M.R Puri MC Operational research and its applications recent trends Alled Publishers Pvt, Ltd
7. David.E. Goldberg 2007 Genetc Algorithm Pearson Education.

Cource Instructors:

sd/-

(Dr. Faiz Ahmed C)

Head of Department :

sd/-

(Dr. Srinivas Daketi)