AMITY UNIVERSITY

UTTAR PRADESH

COURSE TITLE: OPERATIONS RESEARCH

COURSE CODE: QAM 201

CREDIT UNITS: 03
COURSE LEVEL : UG

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	1	-	-	3

Course Objectives:
This course aims to introduce students to
Use operations research techniques for effective decisions–making,
Model formulation and applications that are used in solving business decision problems.

Pre-requisites:
Knowledge of basic mathematics.

Student Learning Outcomes: On completion of this course, a student should be able to

1. Identify and express a decision problem in mathematical form and solve it graphically and by Simplex method,
2. Recognize and formulate transportation, assignment problems and drive their optimal solution.
3. Identify parameters that will influence the optimal solution of an LP problem and derive feasible solution using a technique of O R.

Course Contents/Syllabus:

	Weightage (%)
Module I: Introduction to Operations Research (OR)	**15**
▪ Definitions of Operations Research , ▪ Features of OR and its approach to problem solving; Models and modeling in OR; ▪ Methods for solving OR models; ▪ Phases of OR approach to problem solving; ▪ Application areas of OR .	
Module II: Linear Programming	**25**
▪ Linear Programming (LP) and allocation of resources, ▪ Structure of LP model, Advantages , Assumptions, and Limitations of LP model ; ▪ LP model formulation with examples ; ▪ Graphical and Simplex methods for solving LP model (Up to three variables – only maximization), ▪ Dual of LP model and its economic interpretation; ▪ Standard results on duality; managerial significance of duality.	
Module III : Sensitivity Analysis	**10**
▪ Changes in Objective Function, ▪ Availability of resources and input-output coefficients; ▪ Addition of an additional variable and constraint.	
Module IV: Transportation Model	**25**

▪ Mathematical model of transportation problem; ▪ Feasible Solution Methods: Northwest Method, Lowest Cost Method, and Vogel's Method; ▪ Optimal Solution: Modified Distribution (MODI) Method; ▪ Unbalanced Transportation Problem and its solution; ▪ Degeneracy and its Resolution; ▪ Multiple optimal solutions ; ▪ Maximization transportation problem.	
Module V: Assignment Model	**25**
▪ Mathematical model of assignment problem **;** ▪ Hungarian method for solving assignment problem; ▪ Unbalanced assignment Problem and its solution; ▪ Multiple optimal solutions ; ▪ Maximization assignment problem; ▪ Restrictions on assignment ; ▪ Travelling salesman problem.	

Pedagogy for Course Delivery: Lectures, Case studies, Discussions

The course will be a combination of theoretical and tutorial styles.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	End Term Examination
30		**70**

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment						
Components (Drop down)	**CT**	**HA1**	**HA2**	**ME**	**A**	**End Term Examination**
Weightage (%)	5	5	5	10	5	70

References:

Sharma J K (2013), Operations Research: Theory and Applications, Macmillan Pub India

Wayne L Winston (2004) , Operations Research: Applications and Algorithms, Indiana University,

Taha H A, (2009), Operations Research: An Introduction, Prentice-Hall of India