AMITY UNIVERSITY

UTTAR PRADESH

L	T	P/S	Sw/Fw	Total Credit Units
3	0	-	-	3

COURSE TITLE: DECISION SCIENCE

COURSE CODE: QAM 602

CREDIT UNITS: 03
COURSE LEVEL : PG

Course Objectives:
This course aims to acquaint students with

1. Operations research techniques for effective decisions–making;
2. 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 understand

1. Major steps involved in Operations Research Methodology.
2. Where and how linear programming can help decision makers, and determine when a linear programming problem has multiple solutions and no solution.
3. How to identified a basic feasible solution of a transportation problem .
4. Situations in which queuing problems arise.
5. Importance of network analysis and develop network diagram with activities and events.
6. How uncertainty at a decision environment is examined and review methods useful for making decision in this environment.

Course Contents/Syllabus:

	Weightage (%)
Module I: Operations Research : Quantitative Approach to Decision Making	**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: Goal Programming	
▪ Linear Programming – Basic Concepts, ▪ Model formulation(Application of LPP) ; ▪ Concepts of GP; Difference between LP and GP; ▪ General GP Model ; GP Model Formulation- Single goal with multiple sub-goals , Equally ranked multiple goals, Ranking and weighting of unequal multiple goals ; ▪ Graphical method for solving GP model.	**20**
Module III: Decision Theory and Decision Trees	**20**
▪ Steps of decision –making process, ▪ Types of decision –making environments	

▪ Decision making under uncertainty, and risk ▪ Decision trees analysis	
Module III : Theory of Games	**10**
▪ Two-person zero-sum games; ▪ Pure strategies-games with saddle point ; ▪ Mixed strategies – games without saddle point; ▪ Rules of dominance; ▪ Solution methods of games without saddle point –algebraic method, and graphical method.	
Module IV: Queuing Theory	**20**
▪ Structure of a queuing system; ▪ Performance measures of a queuing system; ▪ Classification of queuing models; Single – server queuing models : exponential service /unlimited queue and exponential service / limited queue ; ▪ Multi –phase service queuing model: Erlang service time distribution with k-phases.	
Module V: Markov Chains	**15**
▪ Characteristics and applications of Markov Chains; ▪ State and transition probabilities; ▪ Multi-period transition probabilities; steady-state conditions; ▪ Absorbing states and accounts receivable application	

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						End Term Examination
Components (Drop down)	**CT1**	**HA1**	**Case Study**	**ME**	**A**	
Weightage (%)	0	10	0	15	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