Xavier Institute of Management, Bhubaneswar
XIM University

Course	**Quantitative Methods for Business Decisions (QMBD)**
Program	**Executive MBA**
Batch	**2023-2024**
Term	**Four**
Credits	**3.0**
Instructor	**Prof. Arun Kumar Paul (arun@xim.edu.in)**

1.0 Course introduction and objectives:

1.1 Course introduction: Most of the successful business decisions rely on a mix of qualitative and quantitative methods to define a problem, select potential alternatives, and help predict what options will have the greatest chance of success. Whether making purchasing, marketing, manufacturing or financing decisions, it is essential to obtain a quantitative foundation to assist in the decision-making process. This course intends to provide a formal quantitative approach to problem solving, to give an insight for managerial situations where a quantitative approach is appropriate and conceptual understanding of the role that quantitative methods play in the decision-making process. In addition to creating the theoretical foundations, this course also introduces some widely used Quantitative Models used for Business Decision.

1.2 Course objectives: After successfully completing this course, students should be able to:

- learn current quantitative tools and techniques used in decision making.
- know quantitative models and their relevance in business situations.
- apply suitable quantitative approaches in business decision making and operations.

2.0 Major course content:

a) Introduction to Qualitative and Quantitative Research; Data and its types;
b) Model formulation; BEP analysis;
c) Problem formulation under constraints – Linear, Non-linear;
d) Multi-Criteria Decision Making (MCDM) – Weighted methods;
e) AHP;
f) LPP, sensitivity analysis and its applications;
g) Monte Carlo simulation – decision with quantified uncertainties;
h) Inferential statistics and applications using SPSS;
i) Regression models using SPSS;
j) Data Envelopment Analysis;
k) Goal Programming basics;
l) Network models with examples;
m) Waiting line models;
n) Theory of Constraints;

o) Game Theoretic approach – Introduction;
p) Multi-Attribute Utility Theory (MAUT) – Introduction;
q) Interpretative Structural Modeling (ISM).

3.0 Course learning outcomes (CLO):

a) **CLO1**: Be able to understand the fundamental concepts of quantitative methods for problem formulation and solving under business conditions.
b) **CLO 2**: Be able to understand, analyse and apply appropriate models for various business function problems.
c) **CLO3**: Be able to exhibit voluntary cooperation and team-working attributes in a group setting to define and solve problems, jointly in a select group and present the findings in the class, and submit a soft copy of the report.

4.0 Reading and references:

a) **Textbook -** Quantitative Methods for Business by Anderson, Sweeney, Williams, Camm & Martin, CENGAGE Learning
b) **Reference books –**
   i. Business Statistics for Contemporary Decision Making by Ken Black, Wiley India
   ii. Basic Econometrics by Damodar N. Gujarati, Mc Graw Hills
   iii. Multivariate Data Analysis, by Joseph F. Hair, Jr; William C. Black, Barry J. Babin and Rolph E. Anderson, Prentice Hall
   iv. Statistics for Management by Levin, Rubin, Rustogi and Siddiqui, 7th edn., Pearson
   v. Data Analysis, Optimization, and Simulation Modeling by Albright, Zappe and Winston, CENGAGE Learning
   vi. Quantitative Methods for Decision Making using Excel by Davis and Pecar, Oxford University Press.
   vii. Selected Reading Articles & Cases will be provided and will be discussed during the course.

5.0 Pedagogy and student's workload:

The pedagogy will include delivery methods like classroom lectures, reading and solving of case studies, reading and analysis of journal articles, quantitative problems solutions and group projects submission and presentations. Students are expected to read the given class materials, solve assignments, and solve problems on their own. It is expected that students should spend around 5-6 hours of time per session for this subject outside the classroom.

6.0 Provisional Session Plan:

Session No.	Topic Description	Remarks
1,2	Introduction to Qualitative and Quantitative Research; Data and its types; Model formulation; BEP analysis Problem formulation under constraints – Linear, Non-linear	Reading materials, Cases will be given to the students.
3,4	Multi-Criteria Decision Making (MCDM) – Weighted methods; AHP	

5 - 8	LPP, sensitivity analysis and its applications (using MS Excel Solver)	
9,10	***Monte Carlo simulation – decision with quantified uncertainties***	
11,12	Inferential statistics, Regression models, SPSS	
13	***Data Envelopment Analysis;*** Goal Programming	
14	Network models	
15,16	Waiting line models	
17	Theory of Constraints	
18	Game Theoretic approach	
19	Multi-Attribute Utility Theory (MAUT); Interpretative Structural Modeling (ISM) - Introduction	
20	Case study presentations; Group work presentations	
Quiz, Final Exam, Group / Case Presentations		As per agreed schedule

7.0 Assessment scheme:

Component	**Weightage (%)**	**Assessment of course learning outcome(s) (CLO)**
Quizzes (two @ 15% each)	30%	CLO1
End-Term	40%	CLO2
Group project presentation	20%	CLO3
Class attendance and participation	10%	CLO1

8.0 Academic discipline and integrity:

- Students are expected to come to / join in the class on time.
- Students are expected to join the class with prior preparation and having done assigned pre-readings.
- Students are expected to submit assignments on time.
- Late coming involves the penalty of no attendance, or sometimes barring from the class, if the reason for coming late is found not satisfactory.
- Utmost care will be taken to *maintain* **class decorum**, *follow* the exact **evaluation norms**, *conduct* fair examinations, fair and transparent evaluation of examination papers, etc.

9.0 Mapping course learning outcomes (CLO) with the program learning goals (PLG):

PLG#	**Program Learning Goal**	**Trait**	**Addressed by Course**	
			Yes	**No**
PLG1	Functional and Business Skills	The students will demonstrate understanding of elements of strategic operations management	Yes	
PLG2	Analytical Skills	The students will use analytical techniques to identify a quality business problem, and suggest a	Yes	

		solution		
PLG3	Collaboration and teamwork attributes	The students will exhibit voluntary cooperation and effective teamwork in a group setting while working on a group-project.	Yes	
PLG4	Ethical responsibility	The students will understand the ethical complexities of conducting business. The students will adopt techniques in scenarios involving ethical dilemma and offer resolution	Yes	
PLG5	Communication	The students will produce reasonably good quality business document as part of the course requirements. The students will become effective and confident communicators, by presenting their views in the class and making the group presentations.	Yes	