

**Xavier Institute of Management
XIM University**

Course Name	Operations Research
Program	MBA-BM
Batch	2025-27
Term	II
Credits	2
Course Instructor(s)	Prof. Sambit Brata Rath <i>E-mail: sambit@xim.edu.in</i> Office: Room No. 204, Third Floor, Administrative Building, XIM Old Campus & Prof. Soumyajyoti Datta <i>E-mail: soumyajyoti@xim.edu.in</i> Office: Room No. 218(B), Third Floor, Administrative Building, XIM Old Campus

Course Introduction and Objectives

Operations Research is a toolbox of mathematical modeling and solution techniques that have evolved since World War II to improve the process of business decision-making. It offers a plethora of tools and solution methods to find the best alternative(s) to a wide array of decisions that managers must make in their strategic, operational, and tactical planning. It also helps students to understand the importance of prescriptive analytics, which has forayed into myriad business domains. In this course, the students will be exposed to various mathematical modeling techniques to model and solve several classes of contemporary business problems by hand as well as with the help of a computer.

Key Course Content

- What is the role of decision-making in business and how is operations research helpful?
- How can business decision-making be formulated as a mathematical model?
- Linear programming problems and its applications in business
- Integer programming problem and its relevance to contemporary business
- Use of computer (Excel Solver) to solve linear programming problems.
- Understanding network models in business
- How to decide with multiple goals?

Course Learning Outcomes (CLO)

- **CLO I:** Be able to understand the application of operations research in contemporary business.

- **CLO II:** Be able to analyze and mathematically model business problems using the knowledge of operations research techniques.
- **CLO III:** Be able to familiarize and solve various management decision-making problems by pen and paper.
- **CLO IV:** Be able to familiarize and solve various management decision-making problems by computer.

Reading and References

Textbook:

- Anderson, Sweeney, Williams, Camm, Cochran, Fry, Ohlmann (2019), An Introduction to Management Science Quantitative Approaches to Decision making

Additional Resources

- Readings/practice exercises/ case studies will be shared during the course as per the course learning outcomes.

Pedagogy and Student Workload

Pedagogy includes lectures, classroom exercises, case studies, and projects. Students are expected to read through the materials given to them as and when required during the course and solve problems/numerals from the recommended textbook which amounts to significant preparation time of 5-6 hours per week (besides the session time). The instructor(s) will share the details of the pedagogical mode, evaluation components, and deliverables in the initial couple of sessions.

It is expected that the student should connect with the faculty in case of any concern or doubt over e-mail or with prior appointment over e-mail.

Session Plan

Session	Topic	Learning	Reading(s)
1	Role of Operations Research in Business Decision-Making	Significance of business decision-making and relevance of Operations Research	Ch-1
2	Modeling Business Problems using Linear Programming	Key Concepts and Terminologies	Ch-2
3	Modeling Business Problems using Linear Programming	Relevance and Application in Business	Ch-2
4	Solution of Linear Programming	Graphical Method and MS-Excel Solver	Ch-2

Session	Topic	Learning	Reading(s)
5	Advanced Linear Programming	Simplex method-key definitions and concepts	Ch-4 and Ch-5
6-7	Duality and Sensitivity Analysis	Understanding key definitions, modeling, and the economic implications for decision-making	Ch 3
8	Integer programming	Business Relevance and Key Definitions	Ch-7
9-10	Integer programming	Business applications	Ch-7
11	Specially Structured Integer Programming Problems – Transportation, Assignment and Transshipment Models	Business applications of a transportation problem and its variants	Ch-6
12	Network Models	Business Relevance and Key Concepts and Solutions	Ch-6 and Ch-20
13	Goal Programming	How to work with multiple goals in a Business Context?	Ch-14
14	Course Wrap-up	General Discussion	

Assessment Scheme

Component	Weightage (%)	Assessment of Course Learning Outcome(s)
Individual Assessments	35%	CLO I, II, III, IV
Group Project	15%	CLO I, II, III, IV
Classroom Participation	10%	CLO I, II, III, IV
End-Term Examination	40%	CLO I, II, III, IV

Academic Discipline and Integrity

- Students are expected to come to class on time. Late coming to class is not accepted.
- Participants are expected to follow the evaluation plan and avoid any violation of the evaluation components. There is no provision for re-examination of the missed components.

- Utmost care will be taken to maintain class decorum, transparent and fair conduction of evaluation components, and follow the evaluation norms as per the manual of policy.
- There is ZERO tolerance for any malpractice during the classroom proceedings or the various evaluation components.
- The instructor reserves the right to modify the sequence of sessions and make minor alterations in course outline and/or evaluation component(s) during the timeline of the course administration.

Mapping Course Learning Outcomes (CLO) with the Program Learning Goals (PLG)

PLG#	Program Learning Goals	Trait	Addressed by Course	
			Yes	No
PLG 1	Functional and Business Skills	The students will demonstrate understanding of elements of all functional areas	✓	
PLG 2	Analytical Skills	The students will use analytical techniques to identify a business problem, and suggest a solution	✓	
PLG 3	Collaboration and Teamwork Attributes	The students will exhibit voluntary cooperation and effective teamwork in a group setting	✓	
PLG 4	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		✓
PLG 5	Communication	The students will produce reasonably good quality business documents. The students will become effective and confident communicators	✓	