Lahore University of Management Sciences

MATH 341 / 547 – Operations Research-I

FALL 2023-24

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Secretary/TA	Noreen Sohail & Shazia Zafar / TBA
TA Office Hours	TBA
Support Services	LUMS offers a range of academic and other services to support students. These are mentioned below, and you are encouraged to use these in addition to in-class assistance from course staff. For a complete list of campus support services available for you click here (https://advising.lums.edu.pk/#supportservices)

COURSE TEACHING METHODOLOGY
• Teaching Methodology: In-person sessions • Lecture details: On campus

Course Basics				
Credit Hours	3			
Lecture(s)	Nbr of Lec(s) Per Week		Duration	
Recitation/Lab (per week)	Nbr of Lec(s) Per Week		Duration	
Tutorial (per week)	Nbr of Lec(s) Per Week		Duration	

Course Distribution	
Core	
Elective	
Open for Student Category	Offered to Juniors, but following may also enroll: Sophomores, Seniors, Masters, PhD
Close for Student Category	Freshmen

COURSE DESCRIPTION
Operations research has had an increasingly great impact on the management of organizations, including business, government, and military. Operations research involves formulation of real life situations into mathematical models, and then developing optimal solutions by application of various algorithms. The purpose of this course is to provide an appreciation of various techniques used in operations research, and their application in developing optimal solutions for real life problems.

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COURSE PREREQUISITE(S)	
	None

COURSE OBJECTIVES	
	Upon successful completion of this course the students will be able to: • Formulate a real-life situation into a mathematical model • Develop an optimal solution for the problem using appropriate algorithm • Interpret the optimal solution, and perform post-optimality analysis • Develop mathematical insight for popular algorithms developed to solve mathematical programs

Grading Breakup and Policy	
Assignments:	30%
Quizzes:	30%
Final Examination:	40%
Closed Books / Closed Notes / No help sheet / Calculator may be required	

Examination Detail	
Final Exam	Final exam will be comprehensive

Campus supports & Key university policies

Campus Supports

Students are strongly encouraged to meet course instructors and TA's during office hours for assistance in course-content, understand the course's expectations from enrolled students, etc. Beyond the course, students are also encouraged to use a variety of other resources. (Instructors are also encouraged to refer students to these resources when needed.) These resources include Counseling and Psychological Services/CAPS (for mental health), LUMS Medical Center/LMC (for physical health), Office of Accessibility & Inclusion/ OAI (for long-term disabilities), advising staff dedicated to supporting and guiding students in each school, online resources (https://advising.lums.edu.pk/advising-resources), etc. To view all support services, their specific role as well as contact information click here (https://advising.lums.edu.pk/#supportservices).

Academic Honesty/Plagiarism

LUMS has zero tolerance for academic dishonesty. Students are responsible for upholding academic integrity. If unsure, refer to the student handbook and consult with instructors/teaching assistants. To check for plagiarism before essay submission, use similarity@lums.edu.pk. Consult the following resources: 1) Academic and Intellectual Integrity (http://surl.li/gpvwb), and 2) Understanding and Avoiding Plagiarism (http://surl.li/gpvwo).

LUMS Academic Accommodations/ Petitions policy

Long-term medical conditions are accommodated through the Office of Accessibility & Inclusion (OAI). Short-term emergencies that impact studies are either handled by the course instructor or Student Support Services (SSS). For more information, please see Missed Instrument or 'Petition' FAQs for students and faculty (https://rb.gy/8sj1h)

LUMS Sexual Harassment Policy

LUMS and this class are a harassment-free zone. No behavior that makes someone uncomfortable or negatively impacts the class or individual's potential will be tolerated.

To report sexual harassment experienced or observed in class, please contact me. For further support or to file a complaint, contact OAI at oai@lums.edu.pk or harassment@lums.edu.pk. You may choose to file an informal or formal complaint to put an end to the offending behavior. You can also call their Anti-Harassment helpline at 042-35608877 for advice or concerns. *For more information: Harassment, Bullying & Other Interpersonal Misconduct: Presentation (http://surl.li/qpvwt)*

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COURSE OVERVIEW	
Topics	**Recommended Readings**
Introduction to Operations Research (OR), Linear Programming (LP)	Chapter 1
LP formulations (Product Mix problems, Diet problems, Blending problems, Scheduling problems, Transportation problems, Assignment problems, Multi-period problems)	2 , 3 Handouts
Graphical Solutions	2
Fundamentals of Simplex Algorithm	4
Simplex Method in Tabular Form	4
Adaptations of Simplex Algorithm	4
Big M Method, Two Phase Method	4
Use of Computer to Solve LP Models (MS Excel, LINDO)	4
Post-optimality Analysis	4 , 5 Handout
Revised Simplex Method	5
Duality Theory	6
Role of Duality in Post-Optimality Analysis	6

The Transportation Problem, Properties of Transportation Problem	7
Generating Basic Feasible Solutions for Transportation, North-West Rule, Vogel Approximation Method	8
Transportation Simplex Method	8
The Assignment Problem	8
Hungarian Method for Solving Assignment Problems	Handout

Textbook
Introduction to Operations Research *(10th Edition) by Hillier & Lieberman*

ACADEMIC INTEGRITY AND CODE OF CONDUCT

We expect utmost integrity from you in all your academic undertakings, and also seek your assistance in collectively upholding the standards of academic integrity at LUMS.