



Course Syllabus

ALP – 3352 - **Quantitative Methods for Business**

Fall 2026

Class: ALP - 3352 – General Business-ALP

Class Time: Asynchronous (1W1 – General -ALP)

Instructor: Dr Sellamuthu Prabakaran

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PM

Office 111. **Eagle Pass, TX 78852.**

Credits: 3

Location: Online (Any Time)

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Required Materials:

Textbook:

We are going to use an ebook and the **Connect** platform from cengage publishing.

Quantitative Methods for Business, by David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, Jeffrey D. Camm, James J. Cochran, Michael J. Fry, Jeffrey W. Ohlmann | 13th Edition, cengage publishing.

Students must Connect access through the link in Blackboard (click on Connect Registration).

Course Description: Quantitative Methods for Business

Quantitative Methods for Business provides students with a comprehensive foundation in the quantitative tools and analytical techniques required for effective decision-making in modern business environments. The course focuses on the practical application of mathematical models, statistical methods, and data-driven approaches to analyze business problems and support managerial decisions.

Topics include fundamental concepts in business mathematics, data organization and visualization, descriptive statistics, probability analysis, sampling methods, hypothesis testing, correlation and regression analysis, forecasting techniques, decision analysis, linear programming, and optimization methods. Students develop the ability to interpret numerical information, identify patterns and trends, evaluate business alternatives, and communicate findings using quantitative evidence.

Through the use of real-world business scenarios and analytical software, students gain experience applying quantitative methods to areas such as accounting, finance, marketing, operations, supply chain management, and entrepreneurship. The course emphasizes critical thinking, problem-solving, and the effective use of data to improve

organizational performance and achieve business objectives. By the end of the course, students will be able to select appropriate quantitative techniques, analyze business data, and make informed decisions in complex and uncertain business situations.

Course Learning Outcomes – Quantitative Methods for Business (6 CLOs)

By the end of this course, students will be able to:

Upon successful completion of this course, students will be able to:

1. Apply quantitative techniques and mathematical models to solve business problems.
2. Analyze and interpret business data using statistical methods and analytical tools.
3. Use probability, forecasting, and regression techniques to support decision-making.
4. Evaluate alternatives and make data-driven business decisions.
5. Apply optimization and quantitative models to improve business performance.

Communicate quantitative findings clearly and effectively

Learning Outcomes – Quantitative Methods for Business Focus

By the end of the course, students will be able to:

1. Apply quantitative methods to analyze and solve business problems using appropriate mathematical and statistical techniques.
2. Use descriptive statistics to organize, summarize, and interpret business data for decision-making.
3. Apply probability concepts to evaluate uncertainty and risk in business situations.
4. Use statistical methods such as correlation, regression, and hypothesis testing to analyze relationships and support business decisions.
5. Develop and interpret forecasting models to predict future business trends and outcomes.
6. Apply optimization techniques to allocate limited business resources efficiently and identify the best possible solutions.
7. Use quantitative models and technology such as spreadsheets and statistical software to analyze business data and present results.
8. Interpret quantitative results critically and communicate findings clearly to support managerial decision-making.

Marketable Skills

Students completing this course will develop the following marketable skills:

- **Quantitative Analysis:** Apply mathematical and statistical techniques to solve

business problems.

- **Data Analysis:** Collect, organize, analyze, and interpret business data.
- **Problem-Solving:** Use logical and analytical approaches to evaluate alternatives and make effective decisions.
- **Statistical Reasoning:** Apply probability, regression, forecasting, and hypothesis-testing techniques.
- **Technology Skills:** Use spreadsheets and quantitative software tools to perform business analysis.
- **Decision-Making:** Use quantitative evidence to support business and managerial decisions.
- **Communication:** Present and explain quantitative findings clearly to technical and non-technical audiences.
- **Critical Thinking:** Evaluate data, assumptions, models, and results to identify meaningful business insights.

Academic Integrity: Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. A scholar is expected to be punctual, prepared, and focused; meaningful and pertinent participation is appreciated. Examples of academic dishonesty include but are not limited to: Turning in work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden. Students should also avoid using open AI sources ***unless permission is expressly given*** for an assignment or course. Violations of academic integrity can result in failing assignments, failing a class, and/or more serious university consequences. These behaviors also erode the value of college degrees and higher education overall.

Classroom Climate of Respect: This class will foster free expression, critical investigation, and the open discussion of ideas. This means that all of us must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, we must all learn how to probe, oppose, and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against other students.

Counseling: Sul Ross has partnered with TimelyCare where all SR students will have access to nine free counseling sessions. You can learn more about this 24/7/356 support by visiting [Timelycare/SRSU](https://www.timelycare.com/srsu). The SR Counseling and Accessibility Services office will continue to offer in-person counseling in Ferguson Hall room 112 (Alpine campus), and telehealth Zoom sessions for remote students and SRSU International students.

Libraries: The Bryan Wildenthal Memorial Library in Alpine offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu/. Off-campus access requires logging in with your LobolD and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or by phone (432-837-8123). No matter where you are based, public libraries and many academic and special libraries welcome the general public into their spaces for study. SRSU TexShare Cardholders can access additional services and resources at various libraries across Texas. Learn more about the TexShare program by visiting library.sulross.edu/find-and-borrow/texshare/ or asking a librarian by emailing srsulibrary@sulross.edu. Mike Fernandez, SRSU Librarian, is based in Eagle Pass (Building D-129) to offer specialized library services to students, faculty, and staff. Utilize free services such as InterLibrary Loan (ILL) and ScanIt to get materials delivered to you at home or via email.

Americans with Disabilities Act (ADA): Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request for each semester for each class. Students seeking accessibility/accommodations services must contact Mary Schwartz, LPC-S, SRSU's Accessibility Services Coordinator at 432-837-8203 (please leave a message and we'll get back to you as soon as we can during working hours), or email mary.schwartz@sulross.edu. Our office is located on the first floor of Ferguson Hall (Suite 112), and our mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas, 79832.

Official Communication: All official communications by the University or me will be sent to your Sul Ross email account. As a result, you are required to activate your email account and check it from time to time for personal communication. I encourage you to email me if you have Questions or comments, BUT PLEASE include your full name and the course for which you have questions. Even if you submit your email through the Blackboard site, I cannot tell which course you are in nor what your real name is (i.e., egar123) unless you put it in the body of your email.

Technical Support: The Support Desk is where you can direct your technical questions. For example, the Support Desk can help you if you are having issues submitting a document, getting videos to play, or using BlackBoard. The support desk is open 24 hours a day/7 day a week for your convenience. You can reach the support desk by calling 888.837.8888 or by email blackboardsupport@sulross.edu. You may also reach the Support desk from the Technology Support tab within Blackboard by clicking the Support Desk graphic on the course homepage or calling 936.294.2780.

SRSU Distance Education Statement: Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing student complaints are located in the student handbook.

Assignments

Late Work: There will be a 10% penalty for assignments submitted late.

Course Requirements and Grading

Requirement	Points Possible	Grading Scale
Weekly Discussion Posts (Total 6) – Due Weekly	350 points (Each 50 Points)	A = 900 to 1000 points
Assignment 1 – Due 7 th September 2026.	150 points	B = 800 to 899 points
Assignment 2 – Due 21 st September 2026.	150 points	C = 700 to 799 points
Assignment 3 – Due Oct 5 th September 2026.	150 points	D = 600 to 699 points
Final Essay Exam – Due 15 th October 2026.	200 points	F = less than 599 points
Possible Points	1000 points	

Course Assignments

Weekly Discussion Board:

1. I as a faculty member will post a weekly discussion board that will be available at 12:01 AM on Tuesday and have a due date of the following Monday at 11:59 PM.
2. Students will be required to respond to the question itself by Friday and reply to two other students by Sunday night.
3. The question will be designed to facilitate discussion by requiring students to offer their analysis, evaluation or design based on the course's weekly topic. (Blooms Levels 5-6).
4. The instructor will be active on the Discussion Board by responding to at least half of the student posts each week.

Discussion Board Rubric: (50 points)

Rubric 1: The student's main post responded completely and substantially to all of parts of discussion question. (30 points).

Rubric 2: The student's initial post was no later than Friday (5 points)

Rubric 3: The response was well-organized, clear and free of grammatical and mechanical errors. (5 points).

Rubric 4: The student posts substantially to two other students. 5 points each (10 points)

Assignment 1

Question 1: Introduction to Probability

A retail store is analyzing customer purchasing behavior. Based on historical data, the probability that a randomly selected customer purchases Product A is 0.60, the probability that the customer purchases Product B is 0.45, and the probability that the customer purchases both Product A and Product B is 0.30.

Required:

1. Calculate the probability that a customer purchases Product A or Product B.
2. Calculate the probability that a customer purchases Product A but not Product B.
3. Calculate the probability that a customer purchases neither Product A nor Product B.
4. Calculate the probability that a customer purchases Product B given that the customer purchased Product A.
5. Determine whether purchasing Product A and Product B are independent events, showing the necessary calculation.

Question 2: Probability Distributions

A company receives an average of 4 customer orders per hour. Assume that the number of orders received per hour follows a Poisson probability distribution.

Required:

1. Calculate the probability that the company will receive exactly 3 orders in one hour.
2. Calculate the probability that the company receives no orders in one hour.
3. Calculate the probability that the company will receive at least 5 orders in one hour.
4. Calculate the expected number and standard deviation of orders received per hour.
5. If the company operates for 8 hours, determine the expected total number of orders during the day.

Instructions: Show all formulas, calculations, and intermediate steps. Round final probabilities to four decimal places.

Criteria	Description	Points
Understanding of Probability Concepts	Demonstrates understanding of sample spaces, events, probability rules, conditional probability, and independence.	25
Accuracy of Numerical Calculations	Correctly applies probability formulas and performs numerical calculations accurately.	35
Probability Distribution Analysis	Correctly identifies and applies the appropriate probability distribution and calculates required probabilities, expected value, and standard deviation.	30
Problem-Solving Approach	Uses appropriate formulas, methods, and logical steps to solve the numerical problems.	25

Criteria	Description	Points
Work Shown and Mathematical Reasoning	Clearly shows formulas, substitutions, intermediate calculations, and reasoning rather than providing only final answers.	20
Interpretation of Results	Correctly interprets numerical results and explains their meaning in the given business context.	10
Presentation and Organization	Assignment is clearly organized, readable, professionally presented, and follows instructions, including appropriate rounding.	5
Total		150

Assignment 2

Question 1: Decision Analysis, Utility, and Game Theory

A company is considering launching a new product. The management team has identified three possible strategies: Large Production (L), Medium Production (M), and Small Production (S). The possible market conditions and their probabilities are:

Market Condition	Probability	L	M	S
High Demand	0.30	\$120,000	\$80,000	\$50,000
Moderate Demand	0.50	\$60,000	\$55,000	\$40,000
Low Demand	0.20	-\$40,000	\$10,000	\$25,000

Required:

1. Calculate the **Expected Monetary Value (EMV)** for each strategy.
2. Determine the **best strategy using EMV**.
3. Calculate the **Expected Opportunity Loss (EOL)** for each strategy.
4. Calculate the **Expected Value of Perfect Information (EVPI)**.
5. Assume the manager's utility function is $U(x) = \sqrt{x + 50,000}$. Calculate the expected utility for the Medium Production strategy using the three possible outcomes and determine whether the utility-based decision agrees with the EMV decision.
6. Two competing firms, A and B, must independently choose either High Price or Low Price. Their profit payoffs are:

B: High Price B: Low Price

A: High Price (80, 80) (30, 100)

A: Low Price (100, 30) (50, 50)

Determine the dominant strategy, Nash equilibrium, and expected payoff for each firm.

Question 2: Time Series Analysis, Forecasting, and Linear Programming

A company's annual sales (in thousands of units) for the past six years are:

Year Sales

2020 120

2021 135

2022 150

2023 160

2024 175

2025 190

Required – Time Series and Forecasting:

1. Calculate the 3-year moving average for 2022, 2023, 2024, and 2025.
2. Using the 3-year moving average, forecast sales for 2026.
3. Using the least-squares method, develop a linear trend equation $Y = a + bX$, where $X = 1$, represents 2020.
4. Use the trend equation to forecast sales for 2026.

A company produces Product A and Product B. Each unit requires the following resources:

Resource	Product A	Product B	Available
Labor hours	2	3	120
Machine hours	4	2	100
Profit per unit	\$40	\$30	—

Let x = units of Product A and y = units of Product B.

Required – Linear Programming:

5. Formulate the objective function and all constraints.
6. Identify the feasible region and determine the optimal production quantities of Products A and B using the graphical method.
7. Calculate the maximum total profit.
8. Determine the amount of unused labor and machine capacity at the optimal solution.

Instructions: Show all formulas, calculations, intermediate steps, and final answers. Round numerical answers to two decimal places where appropriate.

Criteria	Description	Points
Decision Analysis Calculations	Correctly calculates EMV, EOL, EVPI, and identifies the best decision based on the numerical results.	25

Criteria	Description	Points
Utility and Game Theory Calculations	Correctly calculates expected utility and analyzes dominant strategies, Nash equilibrium, and expected payoffs.	25
Time Series Analysis	Correctly calculates moving averages and applies the least-squares trend method.	25
Forecasting Accuracy	Correctly develops the trend equation and calculates the required forecasts using appropriate numerical methods.	20
Linear Programming Formulation	Correctly identifies decision variables, objective function, constraints, and non-negativity conditions.	20
Linear Programming Solution	Correctly identifies the feasible region, optimal production quantities, maximum profit, and unused resources.	20
Calculations and Work Shown	Clearly presents formulas, substitutions, intermediate calculations, and logical numerical steps.	10
Accuracy and Presentation	Final answers are mathematically accurate, properly rounded, clearly organized, and professionally presented.	5
Total		150

Assignment 3

Question 1: Linear Programming, Sensitivity Analysis, and Managerial Applications

A company produces Product A and Product B using limited labor and machine resources. The linear programming model is:

Maximize:

$$Z = 50A + 40B$$

Subject to:

$$2A + B \leq 100$$

$$A + 2B \leq 80$$

$$A, B \geq 0$$

Required:

1. Determine the optimal quantities of Products A and B and the maximum profit.
2. Calculate the slack for each resource at the optimal solution.
3. Determine the shadow price of each resource.
4. If the available labor resource increases from 100 to 110 units, determine the new optimal solution and profit.
5. If the profit contribution of Product A increases from \$50 to \$60 per unit, determine whether the existing optimal solution remains optimal. Show the necessary calculations.

6. A marketing department has a budget of \$20,000 and can spend it on online advertising and television advertising. Online advertising costs \$200 per campaign and generates 5 customer leads; television advertising costs \$500 per campaign and generates 12 customer leads. If at most 60 online campaigns and 30 television campaigns can be purchased, formulate and solve a linear programming model to maximize total customer leads.
7. A finance manager has \$100,000 available for two investments. Investment A earns 8% and Investment B earns 12%. At least \$20,000 must be invested in A, and no more than \$70,000 can be invested in B. Determine the optimal investment allocation and maximum annual return.

Question 2: Distribution and Network Models and Integer Linear Programming

A company must ship products from three warehouses to four retail stores. The available supply, store demand, and transportation cost per unit are:

	Store 1	Store 2	Store 3	Store 4	Supply
Warehouse 1	\$4	\$6	\$8	\$7	50
Warehouse 2	\$5	\$4	\$3	\$6	60
Warehouse 3	\$9	\$7	\$4	\$5	40
Demand	30	45	35	40	150

Required – Distribution and Network Model:

1. Formulate the transportation linear programming model, identifying the decision variables, objective function, and constraints.
2. Determine the optimal shipment quantities from each warehouse to each store.
3. Calculate the minimum total transportation cost.
4. Determine the total quantity shipped from each warehouse and received by each store.
5. Identify the least-cost transportation routes used in the optimal solution.

Integer Linear Programming Application:

A company is considering opening distribution centers in Dallas, Houston, and San Antonio. The fixed costs and annual distribution capacities are:

Distribution Center	Fixed Cost	Capacity
Dallas	\$80,000	4,000 units
Houston	\$100,000	5,000 units
San Antonio	\$70,000	3,000 units

The company must provide at least 7,000 units of total capacity while minimizing total fixed costs.

Required:

6. Formulate an integer linear programming model using binary decision variables.
7. Determine which distribution centers should be opened.
8. Calculate the minimum total fixed cost.

9. Determine the total capacity provided by the selected distribution centers.
10. Verify that the solution satisfies all constraints.

Instructions: Show all formulas, models, calculations, intermediate steps, and final answers. Round monetary amounts to the nearest dollar where appropriate.

Schedule for ALP - 3352 – Fall 2026 - 8 Week

Weeks	Topic	Readings
Week 1 – August 24 th to 30 th August 2026	CONCEPT - GETTING STARTED - Read the syllabus and get familiar with both Blackboard and Connect platforms. Objectives - Begin the course by introducing myself, reading the syllabus, and becoming familiar with both Blackboard and Connect platforms.	Chapter Reading - No chapter reading or homework is assigned, as this is only an introduction class.
	CHAPTER 1. INTRODUCTION – Objectives The objective of this chapter is to understand the role of quantitative methods in business decision-making. Students will learn how mathematical, statistical, and analytical techniques are used to analyze data, solve business problems, and support effective decisions. Key Concepts Quantitative Methods for Business involve the use of numerical data, mathematical models, and statistical tools to analyze business situations. These methods help managers evaluate alternatives, forecast future outcomes, reduce uncertainty, and improve decision-making.	Textbook Chapters 1 – INTRODUCTION
Discussion 1 – Due 30th August, 2026		
Week 2 – August. 31 st August to 6 th September 2026	CHAPTER 2. INTRODUCTION TO PROBABILITY – Objectives The objective of this chapter is to introduce the basic concepts of probability and its application in business decision-making. Students will understand how probability measures uncertainty and helps analyze risks, predict outcomes, and support informed decisions. Key Concepts Probability is the study of uncertainty and the likelihood of events occurring. It provides tools for analyzing possible outcomes using concepts such as experiments, events, sample spaces, and probability rules. Probability methods help businesses evaluate	Textbook Chapters 2 – CHAPTER 2. INTRODUCTION TO PROBABILITY

	risks, make forecasts, and improve decisions under uncertain conditions.	
	CHAPTER 3. PROBABILITY DISTRIBUTIONS Objectives The objective of this chapter is to understand probability distributions and their role in analyzing uncertain business situations. Students will learn how to use probability models to describe, evaluate, and predict possible outcomes for decision-making. Key Concepts Probability distributions describe how probabilities are assigned to different possible outcomes of a random variable. They help summarize data patterns and analyze uncertainty. Common concepts include discrete and continuous probability distributions, expected value, variance, and standard deviation, which are used in business forecasting, risk analysis, and decision-making.	Textbook Chapters 3 – CHAPTER 3. PROBABILITY DISTRIBUTIONS
Discussion 2 – Due 6th September, 2026		
Assignment 1 – Due 7th September, 2026.		
Week 3 – September 7th to 13th September 2026.	CHAPTER 4. DECISION ANALYSIS Objectives The objective of this chapter is to understand the principles of decision analysis and how quantitative techniques support decision-making under uncertainty. Students will learn to evaluate alternatives, assess risks, and select the best possible decisions based on available information. Key Concepts Decision analysis is a systematic approach for evaluating choices and selecting optimal solutions in business situations. It involves identifying alternatives, analyzing possible outcomes, measuring risks, and using tools such as decision trees, expected values, and probability analysis to support effective managerial decisions.	Textbook Chapters 4 – CHAPTER 4. DECISION ANALYSIS
	CHAPTER 5: UTILITY AND GAME THEORY Objectives The objective of this chapter is to understand how utility concepts and game theory support decision-making under risk and competition. Students will learn to evaluate preferences, analyze risk attitudes, and apply strategic approaches to business decisions. Key Concepts Utility measures the value or preference that a decision maker assigns to different outcomes,	Textbook Chapters 5 – CHAPTER 5: UTILITY AND GAME THEORY

	especially when risk and uncertainty are involved. Utility analysis helps managers make decisions beyond monetary values by considering risk preferences and expected utility. Game theory analyzes decision-making in competitive situations where the outcome depends on the actions of other decision makers. Concepts such as risk behavior, strategies, payoffs, and mixed strategies help businesses develop effective competitive decisions.	
Discussion 3 – Due 13th September, 2026		
Week 4 – 14th September to 20th September 2026	CHAPTER 6: TIME SERIES ANALYSIS AND FORECASTING Objectives The objective of this chapter is to understand the concepts of time series analysis and forecasting methods used in business decision-making. Students will learn how historical data patterns can be analyzed to predict future trends and improve planning and decision-making. Key Concepts Time Series Analysis and Forecasting involve the study of data collected over time to identify patterns and predict future outcomes. A time series may include patterns such as trends, seasonal variations, and cyclical movements. Forecasting techniques such as moving averages, exponential smoothing, and trend projection help businesses estimate future demand, sales, and other important variables for effective planning and decision-making.	Textbook Chapters 6 – CHAPTER 6: TIME SERIES ANALYSIS AND FORECASTING
	CHAPTER 7: INTRODUCTION TO LINEAR PROGRAMMING Objectives The objective of this chapter is to understand the principles of linear programming and its application in business decision-making. Students will learn how to formulate mathematical models, identify constraints, and determine optimal solutions for resource allocation problems. Key Concepts Linear Programming is a quantitative technique used to optimize business decisions by maximizing benefits or minimizing costs under given constraints. It involves defining decision variables, developing an objective function, and establishing constraints to represent real-world problems. Linear programming methods, including graphical solutions and computer-	Textbook Chapters 7 – CHAPTER 7: INTRODUCTION TO LINEAR PROGRAMMING

	based tools, help managers allocate resources efficiently and select the best possible solution.	
Discussion 4 – Due 20th September, 2026		
Assignment 2 – Due 21st September, 2026.		
Week 5 – September 21st to 27th September 2026	CHAPTER 8: LINEAR PROGRAMMING: SENSITIVITY ANALYSIS AND INTERPRETATION OF SOLUTION Objectives The objective of this chapter is to understand how changes in linear programming parameters affect the optimal solution. Students will learn to analyze changes in objective function coefficients and constraints, interpret sensitivity analysis results, and use quantitative information for improved business decisions. Key Concepts Sensitivity Analysis examines how changes in the coefficients of a linear programming model influence the optimal solution. It helps managers evaluate the impact of changes in resources, costs, and decision variables without completely solving the problem again. Important concepts include objective function coefficients, right-hand	Textbook Chapters CHAPTER 8: LINEAR PROGRAMMING: SENSITIVITY ANALYSIS AND INTERPRETATION OF SOLUTION
	CHAPTER 9: LINEAR PROGRAMMING APPLICATIONS IN MARKETING, FINANCE, AND OPERATIONS MANAGEMENT Objectives The objective of this chapter is to understand the practical applications of linear programming in different business areas. Students will learn how to formulate and solve linear programming models for marketing, financial planning, and operations management problems, and use optimization techniques to support effective business decisions. Key Concepts Linear programming applications help organizations optimize the allocation of limited resources to achieve business goals. In marketing, linear programming is used for media selection and marketing research decisions. In finance, it supports portfolio selection and financial planning. In operations management, it	Textbook Chapters CHAPTER 9: LINEAR PROGRAMMING APPLICATIONS IN MARKETING, FINANCE, AND OPERATIONS MANAGEMENT

	helps with production scheduling, workforce assignment, make-or-buy decisions, and blending problems. These applications enable managers to maximize benefits, minimize costs, and improve resource utilization.	
Discussion 5 – Due 27th September, 2026		
Week 6 – September 28th to 4th October 2026	CHAPTER 10: DISTRIBUTION AND NETWORK MODELS Objectives The objective of this chapter is to understand distribution and network models used for efficient resource allocation and decision-making. Students will learn how quantitative models support supply chain management, transportation planning, assignment decisions, and network optimization problems. Key Concepts Distribution and Network Models are quantitative techniques used to optimize the movement of goods, resources, and information through networks. These models include transportation problems, transshipment problems, assignment problems, shortest-route problems, and maximal flow problems. They help businesses minimize costs, improve efficiency, and make effective decisions in supply chain, production, and logistics management.	Textbook Chapters CHAPTER 10: DISTRIBUTION AND NETWORK MODELS
	CHAPTER 11: INTEGER LINEAR PROGRAMMING Objectives The objective of this chapter is to understand the concepts and applications of integer linear programming in business decision-making. Students will learn how to develop optimization models with integer constraints, analyze discrete decision problems, and apply integer programming techniques to improve resource allocation and planning decisions. Key Concepts Integer Linear Programming (ILP) is an extension of linear programming in which some or all decision variables are restricted to integer values. It is used for problems involving discrete decisions, such as selection, scheduling, assignment, and resource allocation. Important concepts include integer variables, binary (0–1) variables, mixed-integer programming, constraints, and optimization	Textbook Chapters CHAPTER 11: INTEGER LINEAR PROGRAMMING

	techniques such as branch-and-bound for finding optimal solutions.	
Discussion 6 – Due 4th October, 2026		
Assignment 3 – Due 5th October, 2026		
Week 7 – October 5th to 11th October 2026	CHAPTER 12: ADVANCED OPTIMIZATION APPLICATIONS Objectives The objective of this chapter is to understand advanced optimization techniques used for complex business decision-making. Students will learn how optimization models can be applied to improve efficiency, allocate resources, manage revenue, evaluate performance, and support financial decisions. Key Concepts Advanced Optimization Applications involve the use of mathematical models to solve complex business problems and identify the best possible solutions. Important concepts include Data Envelopment Analysis (DEA) for measuring efficiency, Revenue Management for maximizing income, Portfolio Models for asset allocation, and Nonlinear Optimization for solving problems with complex relationships. These techniques help organizations improve performance, optimize resources, and make effective strategic decisions.	Textbook Chapters CHAPTER 12: ADVANCED OPTIMIZATION APPLICATIONS
	CHAPTER 13: PROJECT SCHEDULING: PERT/CPM Objectives The objective of this chapter is to understand project scheduling techniques using PERT and CPM methods. Students will learn how to plan, schedule, monitor, and control projects by analyzing activity sequences, project completion times, and resource requirements. Key Concepts PERT/CPM are quantitative techniques used for planning and managing projects. PERT (Program Evaluation and Review Technique) focuses on projects with uncertain activity times, while CPM (Critical Path Method) identifies the sequence of activities that determines the total project completion time. Key concepts include project networks, activity sequencing, critical path, expected completion time,	Textbook Chapters CHAPTER 13: PROJECT SCHEDULING: PERT/CPM

	slack time, and project control. These methods help managers improve scheduling, resource allocation, and timely project completion.	
Week 8 – October 12th to 18th October 2026	Final Exam – October 15th, 2026.	
	Week 8 – October 12–18, 2026 – Clarification of Questions, Comprehensive Review, and Preparation for the Final Examination	

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