



University of North Texas
College of Business
LSCM 6071
Operations Research in Logistics and
Supply Chain Management

LSCM 6071 – Operations Research in Logistics and Supply Chain Management

Days and Times: Thursdays from 2:00PM to 4:50PM

Location: BLB 065

Instructor Contact

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Office hours: by appointment only
Email: All Email correspondence must go through Canvas.

Communication Expectations:

The course will meet (face-to-face) each Thursday in BLB 065. We will use Canvas for course content and assignment submissions; and Canvas Email for all email communications. Additionally, you are welcome to send a text to me or call me on either my mobile or office phone. For your consideration, CLEAR has a webpage for students that provides [Online Communication Tips](https://clear.unt.edu/online-communication-tips) (<https://clear.unt.edu/online-communication-tips>).

Welcome to UNT

As members of the UNT community, we have all made a commitment to be part of an institution that respects and values the identities of the students and employees with whom we interact. UNT does not tolerate identity-based discrimination, harassment, and retaliation. UNT's full Non-Discrimination Policy can be found in the UNT Policies section of the syllabus.

Course Description

Focuses on operations research (OR) techniques published in top-tier OR journals and their applications in leading logistics and supply chain management journals. Deterministic (e.g., mathematical programming) and stochastic (e.g., reliability theory and queueing theory) techniques are studied with a focus on delineating between optimal and heuristic techniques (e.g., genetic algorithms and simulated annealing). Real-world, industry problems and supporting data are used to further validate the application of OR techniques to the discipline of logistics and supply chain management. Analytical tools such as MatLab and SPSS are used. The overall pedagogical approach is that of discovery learning, learning by doing, and learning through discussion and debate. Review of published research in the disciplines associated with the modeling and analysis of logistics and physical distribution (movement and storage) systems. Literature chosen for analysis includes both the theoretical background and practical application of the most common analytical tools used in optimizing various characteristics of logistics systems. Two basic modeling approaches are investigated: closed form or analytical

(optimization) and simulation (sensitivity to parameters) in pursuit of both “exact” and “heuristic” solutions. Focus is methodological; however, it spans a broad variety of topical areas.

Course Structure

The course is structured to have three, highly-interdependent, concurrent tracks:

1. Fundamental supply chain knowledge,
2. Literature integration and presentations, and
3. Mathematical modeling techniques.

Each week you will need to:

1. Attending class where we will watch and discuss videos, created by o9 Solutions (<https://o9solutions.com/>), related to fundamental supply chain concepts,
2. Identify one journal article that relates to any SC concept and one journal article that uses an OR technique as part of its methodological approach.
3. One student will have to present their SC concept journal article and one student will have to present their OR technique journal article.
 - a. Articles must have been published in an FT50 journal or an A* journal as identified in the Australian Business Deans Council (ABDC) list.
 - b. The presentation should address the following:
 - i. Title, Author, and Journal
 - ii. Business challenge / problem
 - iii. Research questions / objectives
 - iv. Methods
 - v. Mathematical representation of the problem
 - vi. Theories
 - vii. Literature contributions / research gaps addressed
 - viii. Key findings
 - ix. Business implications
 - x. Research implications
 - xi. Future research
4. Each week an OR technique will be introduced and a student group will be assigned to “discuss” this technique the following week. Discuss here means a presentation describing the technique, its relevance to LSCM, and a solved example using either Solver or Matlab.

Supply Chain Foundational Videos

The foundational SC videos are organized into three, interrelated sections: Supply Chain Management (SCM), Demand Planning (DP), and the Art of the Possible (AOTP). Details on how to access these videos, created by o9 Solutions (<https://o9solutions.com/>), will be described and shown on the first day of class.

Supply Chain Management

The Supply Chain Management module develops key skills and expertise in real-world aspects of the Supply Chain that are generalizable and pervasive across industry sectors. This module focuses on the fundamentals of the Supply Chain, such as Supply Chain Network Design, Inventory Management, and concepts related to Logistics, Transportation, And Warehousing. It

also provides an understanding of Supply Chain Planning Processes, Risk Management, Analytics, and Reporting Techniques that are being used across multiple industries. You will learn about how various cutting-edge technologies enable optimizing the Digital Supply Chain.

After completing the SCM section, you should be able to:

- Define terminologies and definitions of Supply Chain, drivers within Supply Chain, Supply Chain Capabilities, Network and Operations;
- Optimize Inventory, Transportation, Warehousing Services, and Cost;
- Explain Planning Processes, Data Analytics skills, and tools to improve Supply Chain Performance;
- Discuss how to minimize Disruptions, Reduce Risk and make your Supply Chain Resilient; and
- Explain how the cutting-edge technologies, existing system implementations, and proven best practices can improve the efficiency of Supply Chain.

The SCM section covers eight modules:

Module 1 – Supply Chain Fundamentals;

Module 2 – Supply Chain Design;

Module 3 – Planning Process Overview;

Module 4 – Inventory Management, Control, and Safety Stock;

Module 5 – Logistics in Supply Chain;

Module 6 – Supply Chain Risk Management;

Module 7 – Supply Chain Analytics and Reporting; and

Module 8 – Supply Chain Technology and Systems.

Demand Planning

Demand Planning (DP) will help you to understand DP concepts and the application of forecasting solutions in complex business scenarios. The Program covers associated parameters that will help to optimize a demand forecast and improve Supply Chain Performance. The Program further delves into the usage of cutting-edge technologies like AI, Machine Learning, and Deep Learning-based Models to help planners create a reliable Demand Forecast Model. The program is also packed with the guiding principles to implement Demand and Supply Integration (DSI) for businesses to help them contribute to a seamless Supply Chain Operation.

After completing this Program, you should be able to:

Formulate an ideal Demand Planning approach based on your business scenario

- Estimate a Demand Function analyzing the dependents
- Arrive at a Consensus Forecast from within your organization
- Tune the Forecast further using Machine Learning and Deep Learning Models
- Enable Demand Supply Integration (DSI) to exhibit Demand Planning Excellence

The DP section covers four modules:

- Module 1 – Demand Planning: An Overview
- Module 2 – Demand Forecasting
- Module 3 – Forecast Models

- Module 4 – Integrated Demand and Supply Planning

Art of the Possible

The Art of the Possible (AOTP) provides insight on how the o9 Platform is relevant in the Supply Chain Planning domain. AOTP will help you identify the key differentiators and provide you with an overview of all the three user interfaces (Web, Connected Excel, & Mobile). In addition, you will be able to identify the benefits of using o9 in different planning roles, including Demand Planner, Supply Planner, S&Op Planner.

The AOTP section covers five modules:

Module 1 – Introduction to Digital Transformation / o9

Module 2 – Basic Navigation

Module 3 – Demand Planning Use Cases

Module 4 – Supply Planning Use Cases

Module 5 – Control Tower / IBP Use Cases

Literature Integration and Presentation

Students will sign up for one or more topic areas on the first day of class (total number of presentations determined by class size). Each student will make a 30-minute “discussant-type” presentation (i.e., following the format of a discussant at a conference session) in class on the assigned day. The student will then lead the class discussion on the relevant topic and present a conceptual model of the field, a solved example using either Matlab or Solver, and a bibliography of additional readings. It should be noted that students not presenting on a given day *should still come fully prepared* to evaluate and extend the presented material as well as discuss the thought questions assigned for that day.

Topics for OR (not an exhaustive list)

1. Linear Programming
2. Duality Theory
3. Linear Programming under Uncertainty
4. Other Algorithms for Linear Programming
5. The Transportation and Assignment Problems
6. Network Optimization Models
7. Dynamic Programming
8. Integer Programming
9. Nonlinear Programming
10. Metaheuristics
11. Game Theory
12. Decision Analysis
13. Queueing Theory
14. Inventory Theory
15. Markov Decision Processes
16. Simulation

Course Prerequisites or Other Restrictions

There are no prerequisites for the course.

Materials

- No Textbook
- Supply Chain Management (SCM), Demand Management (DM), and the Art of the Possible (AOTP) videos. Details on how to access these videos, created by O9 Solutions (<https://o9solutions.com/>), will be described and shown on the first day of class.
- Matlab
- Excel Solver Add-In
- Student version of LINDO

Course Technology & Skills

Minimum Technology Requirements

- Computer
- Reliable internet access
- Speakers
- Microphone
- Plug-ins
- Microsoft Office Suite
- [Canvas Technical Requirements](https://clear.unt.edu/supported-technologies/canvas/requirements) (<https://clear.unt.edu/supported-technologies/canvas/requirements>)

Computer Skills & Digital Literacy

- Using Canvas
- Using email with attachments
- Downloading and installing software
- Using spreadsheet programs
- Using presentation and graphics programs

Technical Assistance

Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

UNT IT Help Desk

Email: helpdesk@unt.edu

Live Chat: <https://it.unt.edu/helpdesk/chatsupport>

Phone: 940-565-2324

In Person: Sage Hall, Room 330

Hours and Availability: Visit <https://it.unt.edu/helpdesk> for up-to-date hours and availability

For additional support, visit [Canvas Technical Help](https://community.canvaslms.com/docs/DOC-10554-4212710328) (<https://community.canvaslms.com/docs/DOC-10554-4212710328>)

Rules of Engagement

Rules of engagement refer to the way students are expected to interact with each other and with their instructors. Here are some general guidelines:

- While the freedom to express yourself is a fundamental human right, any communication that utilizes cruel and derogatory language on the basis of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law will not be tolerated.
- Treat your instructor and classmates with respect in any communication online or face-to-face, even when their opinion differs from your own.
- Ask for and use the correct name and pronouns for your instructor and classmates.
- Speak from personal experiences. Use “I” statements to share thoughts and feelings. Try not to speak on behalf of groups or other individual’s experiences.
- Use your critical thinking skills to challenge other people’s ideas, instead of attacking individuals.
- Avoid using all caps while communicating digitally. This may be interpreted as “YELLING!”
- Be cautious when using humor or sarcasm in emails or discussion posts as tone can be difficult to interpret digitally.
- Avoid using “text-talk” unless explicitly permitted by your instructor.
- Proofread and fact-check your sources.
- Keep in mind that online posts can be permanent, so think first before you type.

See these [Engagement Guidelines](https://clear.unt.edu/online-communication-tips) (https://clear.unt.edu/online-communication-tips) for more information.

Course Requirements

Activity	Percentage of Final Grade
Course videos	25%
Literature presentations	25%
OR technique presentations	25%
Class Participation	25%
Total	100%

Grading

A = 90-100%
B = 80-89%
C = 70-79%
D = 60-69%
F = Below 60%

Course Evaluation

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course. **I will inform you)in class and on Canvas) when the SPOT evaluations are available.**

Course Policies

Face Coverings

UNT encourages everyone to wear a face covering when indoors, regardless of vaccination status, to protect yourself and others from COVID infection, as recommended by current CDC guidelines. Face covering guidelines could change based on community health conditions.

Attendance

Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course. It is important that you communicate with the professor and the instructional team prior to being absent, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals. Please inform the professor and instructional team if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community.

If you are experiencing any [symptoms of COVID-19](https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html) (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to coming to campus. UNT also requires you to contact the UNT COVID Team at COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure.

Course Materials for Remote Instruction

Remote instruction may be necessary if community health conditions change or you need to self-isolate or quarantine due to COVID-19. Students will need access to a [webcam and microphone – faculty member to include what other basic equipment is needed] to participate in fully remote portions of the class. Additional required classroom materials for remote learning include: [list specific software, supplies, equipment or system requirements needed for the course]. Information on how to be successful in a remote learning environment can be found at <https://online.unt.edu/learn>.

Class Participation

Class participation is mandatory.

Late Work

Late work will not be accepted.

Examination Policy

There are no exams for this course.

UNT Policies

Academic Integrity Policy

Academic Integrity Standards and Consequences. According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

ADA Policy

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the [ODA website \(https://disability.unt.edu/\)](https://disability.unt.edu/).

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)

The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

Emergency Notification & Procedures

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

Retention of Student Records

Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual record; however, information about student's records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University's policy. See UNT Policy 10.10, Records Management and Retention for additional information.

Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's [Code of Student Conduct](https://deanofstudents.unt.edu/conduct) (<https://deanofstudents.unt.edu/conduct>) to learn more.

Access to Information - Eagle Connect

Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail [Eagle Connect](https://it.unt.edu/eagleconnect) (<https://it.unt.edu/eagleconnect>).

Student Evaluation Administration Dates

Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during the last few weeks of the semester to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the [SPOT website](http://spot.unt.edu/) (<http://spot.unt.edu/>) or email spot@unt.edu.

Survivor Advocacy

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct. Federal laws and UNT policies prohibit discrimination on the basis of sex as well as sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking and/or sexual assault, there are campus resources available to provide support and assistance. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-5652648.

Important Notice for F-1 Students taking Distance Education Courses

Federal Regulation

To read detailed Immigration and Customs Enforcement regulations for F-1 students taking online courses, please go to the [Electronic Code of Federal Regulations website](http://www.ecfr.gov/) (<http://www.ecfr.gov/>). The specific portion concerning distance education courses is located at Title 8 CFR 214.2 Paragraph (f)(6)(i)(G).

The paragraph reads:

(G) For F-1 students enrolled in classes for credit or classroom hours, no more than the equivalent of one class or three credits per session, term, semester, trimester, or quarter may be counted toward the full course of study requirement if the class is taken on-line or through distance education and does not require the student's physical attendance for classes,

examination or other purposes integral to completion of the class. An on-line or distance education course is a course that is offered principally through the use of television, audio, or computer transmission including open broadcast, closed circuit, cable, microwave, or satellite, audio conferencing, or computer conferencing. If the F-1 student's course of study is in a language study program, no on-line or distance education classes may be considered to count toward a student's full course of study requirement.

University of North Texas Compliance

To comply with immigration regulations, an F-1 visa holder within the United States may need to engage in an on-campus experiential component for this course. This component (which must be approved in advance by the instructor) can include activities such as taking an on-campus exam, participating in an on-campus lecture or lab activity, or other on-campus experience integral to the completion of this course.

If such an on-campus activity is required, it is the student's responsibility to do the following:

- (1) Submit a written request to the instructor for an on-campus experiential component within one week of the start of the course.
- (2) Ensure that the activity on campus takes place and the instructor documents it in writing with a notice sent to the International Student and Scholar Services Office. ISSS has a form available that you may use for this purpose.

Because the decision may have serious immigration consequences, if an F-1 student is unsure about his or her need to participate in an on-campus experiential component for this course, s/he should contact the UNT International Student and Scholar Services Office (telephone 940-565-2195 or email internationaladvising@unt.edu) to get clarification before the one-week deadline.

Student Verification

UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See [UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses](https://policy.unt.edu/policy/07-002) (<https://policy.unt.edu/policy/07-002>).

Use of Student Work

A student owns the copyright for all work (e.g. software, photographs, reports, presentations, and email postings) he or she creates within a class and the University is not entitled to use any student work without the student's permission unless all of the following criteria are met:

- The work is used only once.
- The work is not used in its entirety.
- Use of the work does not affect any potential profits from the work.
- The student is not identified.
- The work is identified as student work.

If the use of the work does not meet all of the above criteria, then the University office or department using the work must obtain the student's written permission.

Download the UNT System Permission, Waiver and Release Form

Transmission and Recording of Student Images in Electronically-Delivered Courses

1. No permission is needed from a student for his or her image or voice to be transmitted live via videoconference or streaming media, but all students should be informed when courses are to be conducted using either method of delivery.
2. In the event an instructor records student presentations, he or she must obtain permission from the student using a signed release in order to use the recording for future classes in accordance with the Use of Student-Created Work guidelines above.
3. Instructors who video-record their class lectures with the intention of re-using some or all of recordings for future class offerings must notify students on the course syllabus if students' images may appear on video. Instructors are also advised to provide accommodation for students who do not wish to appear in class recordings.

Example: This course employs lecture capture technology to record class sessions. Students may occasionally appear on video. The lecture recordings will be available to you for study purposes and may also be reused in future course offerings.

No notification is needed if only audio and slide capture is used or if the video only records the instructor's image. However, the instructor is encouraged to let students know the recordings will be available to them for study purposes.

Academic Support & Student Services**Student Support Services***Mental Health*

UNT provides mental health resources to students to help ensure there are numerous outlets to turn to that wholeheartedly care for and are there for students in need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

- [Student Health and Wellness Center](https://studentaffairs.unt.edu/student-health-and-wellness-center) (<https://studentaffairs.unt.edu/student-health-and-wellness-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [UNT Care Team](https://studentaffairs.unt.edu/care) (<https://studentaffairs.unt.edu/care>)
- [UNT Psychiatric Services](https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry) (<https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry>)
- [Individual Counseling](https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling) (<https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling>)

Chosen Names

A chosen name is a name that a person goes by that may or may not match their legal name. If you have a chosen name that is different from your legal name and would like that to be used in class, please let the instructor know. Below is a list of resources for updating your chosen name at UNT.

- [UNT Records](#)
- [UNT ID Card](#)

- [UNT Email Address](#)
- [Legal Name](#)

**UNT eulDs cannot be changed at this time. The collaborating offices are working on a process to make this option accessible to UNT community members.*

Pronouns

Pronouns (she/her, they/them, he/him, etc.) are a public way for people to address you, much like your name, and can be shared with a name when making an introduction, both virtually and in-person. Just as we ask and don't assume someone's name, we should also ask and not assume someone's pronouns.

You can [add your pronouns to your Canvas account](#) so that they follow your name when posting to discussion boards, submitting assignments, etc.

Below is a list of additional resources regarding pronouns and their usage:

- [What are pronouns and why are they important?](#)
- [How do I use pronouns?](#)
- [How do I share my pronouns?](#)
- [How do I ask for another person's pronouns?](#)
- [How do I correct myself or others when the wrong pronoun is used?](#)

Additional Student Support Services

- [Registrar](https://registrar.unt.edu) (<https://registrar.unt.edu>)
- [Financial Aid](https://financialaid.unt.edu/) (<https://financialaid.unt.edu/>)
- [Student Legal Services](https://studentaffairs.unt.edu/student-legal-services) (<https://studentaffairs.unt.edu/student-legal-services>)
- [Career Center](https://studentaffairs.unt.edu/career-center) (<https://studentaffairs.unt.edu/career-center>)
- [Multicultural Center](https://edo.unt.edu/multicultural-center) (<https://edo.unt.edu/multicultural-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [Pride Alliance](https://edo.unt.edu/pridealliance) (<https://edo.unt.edu/pridealliance>)
- [UNT Food Pantry](https://deanofstudents.unt.edu/resources/food-pantry) (<https://deanofstudents.unt.edu/resources/food-pantry>)

Academic Support Services

- [Academic Resource Center](https://clear.unt.edu/canvas/student-resources) (<https://clear.unt.edu/canvas/student-resources>)
- [Academic Success Center](https://success.unt.edu/asc) (<https://success.unt.edu/asc>)
- [UNT Libraries](https://library.unt.edu/) (<https://library.unt.edu/>)
- [Writing Lab](http://writingcenter.unt.edu/) (<http://writingcenter.unt.edu/>)