Course Syllabus
ACSO 4020 – PROCESS OPTIMIZATION AND PRESCRIPTIVE ANALYTICS
Fall 2022

Instructor: Thomas Ryan Brindle
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Office Hours: TBA in-person and online by appointment

Required Texts & Materials


https://www.cengage.com/c/student/9780357132098/?filterBy=Student

2. Analytics Solver Add-in for Microsoft Excel

https://www.solver.com/analytics-solver-platform?utm_source=Google&utm_medium=PPC&utm_campaign=Tier1ConventionalOptimization&utm_term=&gclid=CjwKCAjwx7GYBhB7EiwA0d8oewAdEDnDyhe4ESvMep_WuJ8c80-WFH0U_vxwhZE6-fVjaFpLR7Br9RoCtFYQAvD_BwE#tab1

Course Description

Introduction to simulation and optimization processes. How to address complex problems by using day to day operations data. Topics may include deterministic and stochastic modeling for operations research, linear programming, production frontiers and theory of constraints.

Course Learning Outcomes

1. Define the components of a mathematical model.

2. Describe the steps involved in formulating an LP problem.

3. Apply solver software to solve LP models implemented in a spreadsheet.

4. Explain how the simplex method operates.
5. Describe the generalized network flow problem and the unique modeling issues it presents.

6. Formulate and solve a variety of nonlinear optimization problems.

7. Describe how evolutionary/genetic algorithms work.

8. Explain and demonstrate the process of performing simulation in spreadsheets.

**Grading**

Exams (3) - 60%
Final Exam - 20%
Participation and Attendance - 10%
Presentation - 10%

A: 90% - 100%
B: 80% - 89%
C: 70% - 79%
D: 60% - 69%
F: less than 60%

**Attendance & Communication Policy**

Attendance is mandatory. If you expect to be absent please email me before class. You can also connect with me by attending office hours. During busy times, my inbox becomes rather full, so if you contact me and do not receive a response within two business days, please send a follow up email. Office hours offer you an opportunity to ask for clarification or find support with understanding class material, so come visit me! Additional office hours, in person and virtually, will be offered as the semester concludes. Your success is our goal.

**Course Schedule**

Week 1 - Introduction (8/28 – 9/3)

Week 2 – Optimization & Linear Programming (9/4 – 9/10)

Week 3 – Optimization & Linear Programming (9/11 – 9/17)

Week 4 – Modeling and Solving LP Problems (9/18 – 9/24)

Week 5 – Review & Exam 1 (9/25 – 10/1)

*Exam 1 – Mon 9/29*

Week 6 - Sensitivity Analysis and the Simplex Method (10/2 – 10/8)
Week 7 - Network Modeling (10/9 – 10/15)

Week 8 – Integer Linear Programming (10/16 – 10/22)

Week 9 – Goal Programming & Multiple Objective Optimization (10/23 – 10/29)

Week 10 - Exam 2 & Section 3 Introduction (10/30 – 11/5)

Exam 2 – Mon 11/1

Week 11 – Simulation in Analytic Solver (11/6 – 11/12)

Week 12 – Simulation in Analytic Solver (11/13 – 11/19)

Week 13 - Thanksgiving Break (11/20 – 11/26)

Thanksgiving Break - Wed 11/23 to 11/25

Week 14 - Review & Exam 3 (11/27 – 12/3)

Exam 3 - Wed 12/1

Week 15 - Presentations & Final Exam Review (12/4 – 12/10)

Presentation - TBA

Week 16 - Final Exam TBA (12/11 – 12/17)

Student Academic Support Services

- Code of Student Conduct: provides Code of Student Conduct along with other useful links
- Office of Disability Access: exists to prevent discrimination based on disability and to help students reach a higher level of independence
- Counseling and Testing Services: provides counseling services to the UNT community, as well as testing services; such as admissions testing, computer-based testing, career testing, and other tests
- UNT Libraries
- UNT Learning Center: provides a variety of services, including tutoring, to enhance the student academic experience
- UNT Writing Center: offers free writing tutoring to all UNT students, undergraduate and graduate, including online tutoring
- Succeed at UNT: information regarding how to be a successful student at UNT
Diversity Statement

Consistent with the University of North Texas policy on diversity, New College views diversity as encompassing the intersecting identities that make us unique individuals, including (but not limited to) ethnic/racial identity, nationality, sexual identity, gender identity and expression, age, religious/spiritual beliefs, socioeconomic status, body shape/size, physical ability status and varying points of view. In our dedication to the creation of a safe space, you can expect us to be welcoming and affirming. New College recognizes and acknowledge the impact of stereotypes, prejudice, discrimination, oppression, power and privilege, and are committed to creating an environment within our center, and in the campus community, that embraces and celebrates diversity. We pledge to honor and respect both the similarities and differences in our relationship with you. Collectively as a staff, we commit to diversity competence a life-long learning process. If you ever have a concern about our response to diversity or other aspects of our services, please contact your Program Director, Department Chair, or Academic Dean.

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. [Insert specific sanction or academic penalty for specific academic integrity violation.]

ADA Policy

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable 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 reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access website (http://www.unt.edu/oda). You may also contact ODA by phone at (940) 565-4323.
Course Safety Procedures

Students enrolled in INDS 3020 are required to use proper safety procedures and guidelines as outlined in UNT Policy 06.038 Safety in Instructional Activities. While working in laboratory sessions, students are expected and required to identify and use proper safety guidelines in all activities requiring lifting, climbing, walking on slippery surfaces, using equipment and tools, handling chemical solutions and hot and cold products. Students should be aware that the UNT is not liable for injuries incurred while students are participating in class activities. All students are encouraged to secure adequate insurance coverage in the event of accidental injury. Students who do not have insurance coverage should consider Standard Syllabus Statements Related Policy 06.049 Course Syllabi Requirements obtaining Student Health Insurance. Brochures for student insurance are available in the UNT Student Health and Wellness Center. Students who are injured during class activities may seek medical attention at the Student Health and Wellness Center at rates that are reduced compared to other medical facilities. If students have an insurance plan other than Student Health Insurance at UNT, they should be sure that the plan covers treatment at this facility. If students choose not to go to the UNT Student Health and Wellness Center, they may be transported to an emergency room at a local hospital. Students are responsible for expenses incurred there.

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. The Code of Student Conduct can be found at deaanofstudents.unt.edu/conduct.

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: eagleconnect.unt.edu/

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 weeks 13, 14 and 15 [insert administration dates] of the long semesters 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 at http://spot.unt.edu/ or email spot@unt.edu.

Sexual Assault Prevention

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit 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. UNT’s Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim’s compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565-2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at oeo@unt.edu or at (940) 565 2759.