IE 1081– Operations Research

Fall 2023

Class

- **Section 1**
    - Time: Monday 8:15 AM -11:00 AM
    - Location: Rm 3-104
- **Section 2**
    - Time: Thursday 8:15 AM -11:00 AM
   - Location: Rm 3-104

Instructor

- Name: Di Liu
- Email: di.liu@scupi.cn
- Office: Rm 3-324A

TAs

- Name: Hanze Qin
  Email: 2020141520070@stu.scu.edu.cn

- Name: Zhenrui Bai
  Email: 2020141520195@stu.scu.edu.cn

Office hours

- Right after each class in the classroom.
- Instructor: Section 1: Monday: 13:20 - 16:20, or by appointment.
- Instructor: Section 2: Thursday 13:20 - 16:20, or by appointment.
- Online via QQ Group, both Sections: 894913090
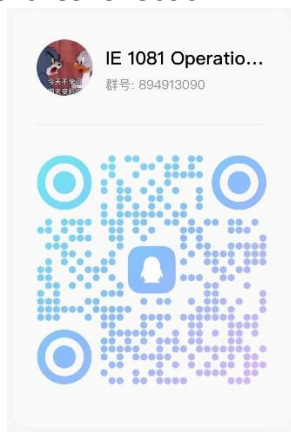
Notes

- This syllabus is subject to change. Please follow updates announced during class and posted on Blackboard website.
- When emailing the instructor or TAs, please include "IE 1081" and your section number in the subject field of your message. Use your university email account (student_ID_number@stu.scu.edu.cn), since mails from other accounts might be stopped by the SCU spam filter. Thanks! ^_^

Course Description

Operations Research helps in solving problems in different environments that need decisions. Topics in this course include linear programming, simplex method, duality theory, assignment and transportation problems, network flow problems, etc. Analytic techniques will be used to solve problems in decision making.

Prerequisites

- MATH 0240, MATH 0280, IE 1070

Course Objectives

- To acquaint students with analytical/OR modeling techniques, and modeling & solution software that can be used to support various optimal decision making.
- To give students experience in building models, deriving solutions and analyzing results through some case studies and assigned homework exercises.

Applicable ABET Outcomes

- An ability to apply knowledge of mathematics, science and engineering
- An ability to analyze and interpret data
- An ability to identify, formulate and solve engineering problems
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Textbook

- Hillier, F.S. and Lieberman, G.J. (2015, 10th Edition), *Introduction to Operations Research*, McGraw-Hill Education, New York, New York, USA.

Grade

90.00 – 100.00 A	85.00 – 89.99 A-	80.00 – 84.99 B+	76.00 – 79.99 B	73.00 – 75.99 B-
70.00 – 72.99 C+	66.00 – 69.99 C	63.00 – 65.99 C-	60.00 – 62.99 D	0.00 – 59.99 F

Assessments

- In-class Quiz: 10%
- Homework: 20%
- Midterm Exam 1: 20%
- Midterm Exam 2: 20%
- Final Exam: 30%

Class Policy

Regular attendance is essential and expected. Important dates and plans will be announced during class. **It is imperative that you come to class prepared.** This will generally involve reading one or more chapters of the textbook, thinking, engaging with fellow students, practice and performing preliminary calculations. This is a three credit hours class, which means you should expect to devote at least 9 to 12 hours of effort outside the scheduled class time every week.

Homework and Other Assignments

Homework problems and other assignments will be assigned periodically and are due as stated in the assigned paper. All work will be submitted electronically through the Blackboard system. Late submission **WILL NOT** be accepted. **Students' names and ID numbers** must be listed on the first page. It is your duty to make sure that submission through Blackboard has been properly processed. Unless specifically requested, emailed homework will not be accepted. If you have a compelling emergency that prevents you from turning in the homework on time, please email the instructor.

All of the homework scores will be used in your grade computation. Unless otherwise indicated, you can work with your fellow classmates in the class, but you must submit a distinct and independent write-up to receive credit. If plagiarism is caught, zero score for all homework.

If you believe an error has been made in the grading of an assignment, bring it to the attention of your TA **within ONE WEEK** from its return.

Please adhere to these homework guidelines:

- Put your name, ID number (last 4 digits), and class section at the top of the first page.
- All work must be shown for each solution to receive full credit. Present your solution in a logical fashion, showing and explaining all steps in detail.
- Obtaining the correct answer includes getting the correct quantity, number of significant digits, sign, and unit.

Exams

There will be three exams (two Midterm and one Final), all are **CLOSED-BOOK**. Students can bring one A4 page note and it must be **hand-written on two sides** of the paper. It cannot be a photocopy. If you must miss an exam, you **MUST** make alternative arrangements with the instructor before the exam is given. If you miss an exam without prior notification, you will receive a score of "**ZERO**" for that exam except under extenuating circumstances.

Make-Up Exams

Students who have not taken any one of the exams are NOT eligible to take the make-up exam. The make-up exam grade will be used to replace the final exam grade. Students taking make-up exams can only attain at most a "D" grade.

Avoiding Plagiarism

- Unacknowledged direct copying from the work of another person, or the close paraphrasing of somebody else's work, is called plagiarism and is a serious offence, equated with cheating in examinations. This applies to copying both from other students' work and from published sources such as books, reports or journal articles.
- Paraphrasing, when the original statement is still identifiable and has also no acknowledgement, is plagiarism. A close paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable for you to put together Unacknowledged passages from the same or from different sources linking these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is a form of plagiarism.

Tentative Topics

No.	Topic	Chapters in Textbook
1	Modelling	Chapters 1, 2, 3
2	Simplex Method	Chapter 4
3	Theory of Simplex Method	Chapter 5
4	Dual Theory	Chapters 6, 8
5	Sensitivity Analysis	Chapters 4, 7
6	Transportation and Assignment Problems	Chapter 9
7	Network Problems	Chapter 10