Capital University of Economics and Business
Overseas Chinese College
Course Syllabus

Year and Semester	2022 Spring (February 28, 2022 – July 17, 2022)
Course Name	Operations Research
Course Code	MAT 333
Course Type	☐ General Education (Required) ☐ General Education (Elective)
	☐ Professional Course (Required) ☑ Professional Course (Elective)
	☐ Basic Disciplinary Course
Course Credits	3
Course Hours	48
Prerequisites	Calculus, Linear Algebra, Probability & Statistics
Instructor	Ling Li
Contact Information	Office: C217
	Tel: 010-83961082
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Office Hour	TBA
Learning Centre	TBA
Grade/Section	2019BA/2019ACCA1&ACCA2
Course Time/Place	M: 9:55-12:20/A104 F: 9:55-12:20/5#204

Textbook

An Introduction to Management Science (Quantitative Approaches to Decision Making (12th edition) David Anderson ISBN:9787111290353

Reference Book

Introduction to Operations Research (9th edition) by Hillier, F.S. and Lieberman, G.J. ISBN: 7302122431

Course Description

Operations research (OR) is concerned with optimal decision making in, and modeling of, deterministic and probabilistic system that originate from real life. It is useful to structure the real life situation into a mathematical model, abstracting the essential elements so that a solution relevant to the decision maker's objective can be sought. Developing a solution, including the mathematical theory that yields on optimal value of the system measure of desirability. This course will cover the deterministic models in OR and the mathematical foundation of the solution techniques for OR models will be emphasized.

Student Learning Objectives

After completing this course, students will be able to:

Knowledge:

- Develop linear programming for engineering and economic systems
- Develop transportation programming for engineering and economic systems
- Determine optimal solutions to a variety of mathematical programming problems
- Present managerial recommendations based on optimal solutions and sensitivity analysis
- Master the inventory theory to solve problems about the EOQ model
- Master the decision analysis to solve certain problems

Capability:

- Develop skills and work problems involving linear programming
- Develop skills and work problems involving sensitivity analysis and duality problem
- Develop skills and work problems involving PERT/CPM
- Develop skills and work problems involving inventory problem and waiting line problem
- Demonstrate proficiency in Operations Research application for real life problems

Mindset:

- Foster the interest of learning Operations Research
- Develop their logical thinking ability and creative thinking ability
- Cultivate the spirit of cooperation and team work
- Get the awareness of connecting between knowledge and life experiences
- Develop their patriotic emotion through learning Operations Research

Website Source

1. http://en.wikipedia.org/wiki/Operations research

2. http://nptel.iitm.ac.in/video.php?courseId=1110

Teaching Methods

This course consists of lectures, discussions and student presentations. Students will be divided into small groups with a group leader helping others in the group. Students must be prepared to finish some small questions and small quizzes during the class.

Grade Criterion

Component	Weight	Description
Final Exam	20%	A cumulative final examination will be given based on all of the contents of the class. A minimum of 25% of the exam (5 of the 20%) will consist of questions utilizing the application of critical thinking.
Mid-Term Test	20%	A cumulative midterm examination will be given based on all of the contents of the first half of the class. A minimum of 25% of the exam (5 of the 20%) will consist of questions utilizing the application of critical thinking.
Homework	15%	Homework problems will be assigned throughout the term, including but not limited to: terminologies, research project, and reading assignments.
Quizzes	15%	There will be at least 2 quizzes during the semester. The purpose of the

		quizzes is to ensure that students keep up with the readings. It may also be used as a way to check the attendance. Quizzes will test your knowledge of both concepts and the application of those concepts.
Presentation	10%	The students will be divided into several groups to prepare a presentation. Each student is required to be involved in the presentation. The topics can be selected from the textbook or lectures. Each group need to finish a PPT related to the topic which is given and hand in the related resources to the teacher before the presentation. The percentage is : content50%+organization10%+language15%+performance25%
Participation	10%	Individuals will be asked to participate individually in questions during the semester. Students are required to meet with their teachers every week. Their performances should be counted in their participation.
Attendance	10%	Refer to attendance policy listed below
Total	100%	

Detailed Grade Computation

	Before Midterm	After Midterm
Attendance	5%	5%
Participation	5%	5%
Homework	5%	10%
Quizzes	5%	10%
Presentation		10%
Midterm test	20%	
Final exam		20%
Total	40%	60%

Grading Policy

A+ 97-100	A 93-96	A- 90–92	B+ 87-89	B 83-86	B- 80–82
C+ 75-79	C 70-74	C- 67–69	D+ 63–66	D 62-60	F 0- 59

Exam Schedule

Midterm Test: Apr.25-Apr.29

Final Exam: June.20-June.24

Assessment of Student Performance

☞ *Self-Study and Reading ability Practice*

Instructor will give out the chapters or the reference books to read and use class hours to have discussion; students should be able to show a proactive attitude and ability for self-study and reading. Knowledge and oral English will be elements of homework or presentation score.

☞ *Homework*

Students should finish their homework by themselves. Copying from others will be treated as cheating and the homework scores will be lowered. Students should hand in all assignments on time. Late assignments will be accepted at the discretion of the instructor (i.e., when the student was ill or had an excused absence). Late assignments without reasonable proof will be reduced in score by 50%.

☞ *Attendance*

Because the course covers a great deal of material, attending every class session is very important for performing well.

- Being late for 15 minutes or more is considered an absence.
- Five hours or above of unexcused absences will result in the lower level of the final grade by one grade band (e.g. from C – to D +). Any excused absence must be discussed directly with the teacher.
- Absence which is more than 1/3 of the total teaching hours will cause an F (a failing grade) directly, but students are welcome to continue attending classes.
- An incomplete grade (I) will be considered in case of medical or family emergencies.

☞ *Participation*

- Students should participate in classes actively. Half of participation grade is determined by their presentation in class. They are encouraged to ask questions relevant to the subject and express their own opinions. Every student should respect the ideas, opinions, and questions of their classmates.
- Students should also use office hours to ask questions or talk with the instructor for good communication and effective learning.
- Frequent visiting the instructor and chatting in English during office hours is highly recommended.
- Any misbehavior and non-class related activities in class will result in the lower level of the participation grade, including ringing cell phones.
- All above behaviors will be solely evaluated by the instructor for scoring.

☞ *Textbook*

Students must bring the textbook to class.

Topical Course Outline

Week	Date	Topics	Homework
1	Feb.28-Mar.4	● Chapter 1 Introduction to Operations Research	——
2	Mar.7-Mar.11	● Chapter 2 Introduction to linear programming	——
3	Mar.14-Mar.18	● Chapter 3 Sensitivity analysis and interpretation of solution	——
4	Mar.21-Mar.25	● Chapter 5 Simplex Method I	——
5	Mar.28-Apr.1	● Chapter 5 Simplex Method II	——
6	Apr.4-Apr.8	● Chapter 6 Duality theory and sensitivity analysis	——
7	Apr.11-Apr.15	● Chapter 7 The transportation and assignment problems ● Review and Quiz	——
8	Apr.18-Apr.22	● Chapter 7 The transportation simplex method	——
9	Apr.25-Apr.29	● Review and Midterm	——
10	May.2-May.6	● Chapter 10 Project Scheduling	——

11	May.9-May.13	● Chapter 11 Inventory Models	——
12	May.16-May.20	● Students' presentation	——
13	May.23-May.27	● Chapter 12 Queuing Theory	——
14	May.30-June.3	● Chapter 14 Decision Analysis	——
15	Jun.6-Jun.10	● Review and Quiz	——
16	Jun.13-Jun.17	● Chinese Review Session	——
17	Jun.20-Jun.24	● Final Exam	——

Note: Some chapters or sections may leave for self-study, this is the students' duty to learn and understand, they may also be included in the quizzes or exams.

A review in Chinese may be held during L.C. and O.H. in the semester.

Teacher's Office Hour

* The instructor's office hour is shown in the front of the office door.
* Students are suggested to use the instructor's office hour and learning center to ask questions or talk with the instructor once at least per week for good communication and effective learning, which is recorded in the students' participation.
* The time can be scheduled by instructors or students, or both.

Cheating and Plagiarism

Cheating is not tolerated. Any student caught cheating on a quiz; test or exam will be given a mark of zero (0) for the particular work. At the beginning of the semester the definition of plagiarism will be carefully explained, when any thoughts or writings of another person are used, they must be clearly identified (usually one uses quotation marks) and the source notes. **If any student is caught cheating on any homework assignment, the highest score the student can earn in that course is a "C".**

Important Dates

Spring Semester, 2022	February 28, 2022— July 17, 2022
February.28	Classes Begin
April.5	Qing Ming Holiday (tentative)
April.22	Spring Sports
April.25-April.29	Midterm Test (tentative)
May.1	National Labor's Holiday (tentative)
June.3	Duan Wu Holiday (tentative)
June.20-June.24	Final Exam Period (Sophomores and Juniors)
June.27-July.17	Social Practice for Sophomores and Juniors
July.11-July.15	Final Exam Period (Freshman)
July.19	Summer Vacation Begins

Note: This syllabus is tentative and may be changed or modified throughout the semester. All students will be notified and a new syllabus will be given.

Instructor: <u>Li Ling</u>   **Department Head: <u>Prof. Jingning Li</u>**

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