**Capital University of Economics and Business**

**Overseas Chinese College**

**Course Syllabus**

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| **Year and Semester** | 2021 Spring (March 1, 2021 – July 16, 2021) |
| **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 |
|  | Email: liling@cueb.edu.cn |
| **Office Hour** | TBA |
| **Learning Centre** | TBA |
| **Grade/Section** | 2018IT/Y01 |
| **Course Time/Place** | T: 8:00-9:50 F: 8:00-8:50/博学楼206/210 |
| **Textbook** |
| An Introduction to Management Science (Quantitative Approaches to Decision Making (12th edition) David Anderson ISBN:9787111290353 |
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| **Reference Book** |
| Introduction to Operations Research (9th edition) by Hillier, F.S. and Lieberman, G.J. ISBN: 7302122431 |
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| **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.  |
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| **Student Learning Objectives** |
| After completing this course, students will be able to:🞟 Develop linear programming for engineering and economic systems🞟 Develop integer 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 |
| **Website Source** |
| * 1.http://en.wikipedia.org/wiki/Operations research
* 2. http://nptel.iitm.ac.in/video.php?courseId=1110
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| **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. |
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| **Grade Criterion** |
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| **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% |  |

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| **Detailed Grade Computation** |
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|  | **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% |

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| **Grading Policy** |
| A+ 97-100 A 93-96 A- 90–92 B+ 87-89 B 83-86 B- 80–82C+ 75-79 C 70-74 C- 67–69 D+ 63–66 D 62-60 F 0- 59 |
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| **Exam Schedule** |
| Midterm Test: Apr.26-Apr.30Final Exam: June.21-June.25 |
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| **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. |
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| **Topical Course Outline** |
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| **Week** | **Date** | **Topics** | **Homework** |
| 1 | Mar.1-Mar.5 | ⚫ Chapter 1Introduction to Operations Research⚫ Chapter 2Introduction to linear programming, graphical approach | \_\_\_\_ |
| 2 | Mar.8-Mar.12 | ⚫ Chapter 2Introduction to linear programming, graphical approach II⚫ Chapter 3Sensitivity Analysis I | —— |
| 3 | Mar.15-Mar.19 | ⚫ Chapter 3Sensitivity Analysis II | —— |
| 4 | Mar.22-Mar.26 | ⚫ Chapter 5Simplex Method I |  —— |
| 5 | Mar.29-Apr.2 | ⚫ Chapter 5Simplex Method II | —— |
| 6 | Apr.5-Apr.9 | ⚫ Chapter 6Duality Theory and Sensitivity Analysis | —— |
| 7 | Apr.12-Apr.16 | ⚫ Chapter 7The transportation and Assignment Problems | —— |
| 8 | Apr.19-Apr.23 | ⚫ Chapter 8Integer Programming⚫ Chapter 9Network⚫ Quiz | —— |
| 9 | Apr.26-Apr.30 | ⚫ Review and Midterm | —— |
| 10 | May.6-May.8 | ⚫ Chapter 10Project Scheduling | —— |
| 11 | May.10-May.14 | ⚫ Chapter 11Inventory Models | —— |
| 12 | May.17-May.21 | ⚫ Students’ presentation | —— |
| 13 | May.24-May.28 | ⚫ Chapter 12Queuing Theory | —— |
| 14 | May.31-June.4 | ⚫ Chapter 14Decision Analysis | —— |
| 15 | Jun.7-Jun.11 | ⚫ Review and Quiz | —— |
| 16 | Jun.15-Jun.18 | ⚫ Chinese Review Session | —— |
| 17 | Jun.21-Jun.25 | ⚫ Final Exam | —— |

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| ***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.* |
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| **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. |
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| **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".** |
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| **Important Dates** |
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| **Spring Semester, 2021** | **March 1, 2021— July 16, 2021** |
| March.1 | Classes Begin（Freshmen） |
| April.4 | Qing Ming Holiday (tentative) |
| April.16 | Spring Sports |
| April.26-April.30 | Midterm Test (tentative) |
| May.1 | National Labor’s Holiday (tentative) |
| June.12-June.14 | Duan Wu Holiday (tentative) |
| June.21-June.25 | Final Exam Period (Sophomores and Juniors) |
| June.28-July.18 | Social Practice for Sophomores and Juniors |
| July.12-July.16 | Final Exam Period (Freshman) |
| July.19 | Summer Vacation Begins |

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| ***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.* |
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| **Instructor: Li Ling Department Head: Prof. Jingning Li**  |

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