



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

Course Name:
Mathematical Programming

1	Course title	Mathematical Programming
2	Course number	0301371
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	0301241
5	Program title	B.Sc. in Mathematics
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Mathematics
10	Level of course	Bachelor
11	Year of study and semester (s)	2017/2018
12	Final Qualification	B.Sc. in Mathematics
13	Other department (s) involved in teaching the course	
14	Language of Instruction	English
15	Date of production/revision	December 10, 2017

16. Course Coordinator:

Course coordinator: Dr. Baha Alzalg
 Office number: Mathematics Building 306
 Office hours: T.B.D.
 Phone number: 0096265355000 Ext. 22086
 Email addresses: b.alzalg@ju.edu.jo
 Course website: <http://sites.ju.edu.jo/sites/Alzalg/Pages/371.aspx>

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

18. Course Description:

Formulation of linear problems, the simplex method, the geometry of the simplex method, duality in linear programming, the dual simplex method, sensitivity analysis, introduction to graphs, network flows.

19. Course aims and outcomes:**A- Aims:**

1. Able to develop an optimization model from a problem description.
2. Provide a detailed treatment of the theory of linear optimization.
3. Learn the simplex algorithm solving for linear optimization.
4. Develop a fundamental understanding of duality theory.
5. Conduct sensitivity analysis for linear programming problems and interpret the results.
6. Learn optimization algorithms for solving network flow problems.
7. Learn interior-point algorithms for solving linear optimization.

B- Intended Learning Outcomes (ILOs):

Successful completion of the course should lead to the following outcomes:

A. Knowledge and Understanding Skills: Student will be able to

- A1) State the theories and concepts used in linear optimization.
- A2) Apply the simplex method in linear optimization.
- A3) Apply interior point methods in linear optimization.

B. Intellectual Analytical and Cognitive Skills: Student will be able to

- B1) Apply appropriate theories, principles and concepts relevant to linear optimization.
- B2) Apply appropriate theories, principles and concepts relevant to duality in linear optimization.

C. Subject- Specific Skills: Student will be able to

- C1) Plan and design applications using techniques and procedures appropriate to the simplex method.
- C2) Plan and design applications using techniques and procedures appropriate to interior point methods.

D. Creativity /Transferable Key Skills/Evaluation: Student will be able to

- D1) Deal with an appropriate effective data relevant to linear optimization.
- D2) Solve linear optimization models using ideas and techniques some of which are at the forefront of the discipline.

20. Topic Outline and Schedule:

The following is a rough plan. As the course progresses, I may include new topics and/or delete some of the ones listed here.

Topic	Achieved ILOs	Weeks
Chapter 1. Introduction to linear programming		1-2
Chapter 2. The geometry of linear programming		3
Chapter 3. The simplex method		4-6
Chapter 4. Duality theory		7-9
Chapter 5. Sensitivity analysis		10
Chapter 7. Network flow problems (7.1, 7.2, 7.6, 7.7)		11-12
Chapter 9. Interior point methods		13-16

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

1. The instructor will spend most of the class time on presenting the new material as well as on discussing the new ideas and techniques with the students.
2. To actively participate in class, students need to prepare before class by reading the textbook and doing all assigned problems before class.
3. Students should be prepared to discuss their homework at each class meeting.
4. Students are encouraged to work together with other students and to ask questions and seek help from their professor, both in and out of class.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

ILO/s	Learning Methods	Evaluation Methods	Related ILO/s to the program
	Lectures	Exams and Assignments	To develop the necessary skills to do independent and original research

23. Course Policies:

1. Attendance is absolutely essential to succeed in this course. You are expected to attend every class; please notify your instructor if you know you are going to be absent. All exams must be taken at the scheduled time. Exceptions will be made only in extreme circumstances, by prior arrangement with the instructor.
2. If a student is absent for more than 10% of lectures without an excuse of sickness or due to other insurmountable difficulty, then he/she shall be barred from the final examination also he/she will get a failing grade in this course.
3. Medical certificates shall be given to the University Physician to be authorized by him. They should be presented to the Dean of the Faculty within two weeks of the student's ceasing to attend classes.
4. Test papers shall be returned to students after correction. His/her mark is considered final after a lapse of one week following their return.
5. Solutions for the exams will be posted at the teaching webpage of the instructor.
6. Cheating is prohibited. The University of Jordan regulations on cheating will be applied to any student who cheats in exams or on home works.

24. Required equipment:

Data Show.

25. References:

A- Required book (s), assigned reading and audio-visuals:

D. Bertsimas and J. Tsitsiklis. Introduction to Linear Optimization. Athena Scientific Series in Optimization and Neural Computation.

B- Recommended books, materials, and media:

Ronald L. Rardin, Optimization in Operations Research. Prentice Hall, 1998.

W.L. Winston and M. Venkataramanan, Introduction to Mathematical Programming. 4th edition. Thomson Brooks/Cole.

26. Additional information:

NA

Date: Decemebr 10, 2017

Name of Course Coordinator: Dr. Baha Alzalg.

Signature: -----

Head of curriculum committee/Dept.: Prof. Emad Abuosba.

Signature: -----

Head of Department: Dr. Baha Alzalg.

Signature: -----

Head of curriculum committee/Faculty: Prof. Amal Al-Aboudi.

Signature: -----

Dean: Prof. Sami Mahmoud.

Signature: -----

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Head of Department

Assistant Dean for Quality Assurance

Course File