MA30087/50087 Optimisation methods of operational research

2015/16 Semester I

Contacts

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- **Unit homepage:** http://people.bath.ac.uk/masss/ma30087.html
- **Lecture notes:** http://people.bath.ac.uk/masss/ma30087/notes.pdf

Anticipated timetable

Week	Monday 11:15 3WN 2.1	Monday 15:15 CB 1.11	Thursday 12:15 3WN 2.1
1 (28 Sep 15)	Lecture 1	Lecture 2	Problems Class
2 (05 Oct 15)	Lecture 3	Lecture 4	Problems Class Question Sheet One out
3 (12 Oct 15)	Lecture 5	Lecture 6	Problems Class Question Sheet One in Question Sheet Two out
4 (19 Oct 15)	Lecture 7	Lecture 8	Problems Class Question Sheet Two in Question Sheet Three out
5 (26 Oct 15)	Lecture 9	Lecture 10	Problems Class Question Sheet Three in Question Sheet Four out
6 (02 Nov 15)	Lecture 11	Lecture 12	Problems Class Question Sheet Four in Question Sheet Five out
7 (09 Nov 15)	Lecture 13	Lecture 14	Problems Class Question Sheet Five in Question Sheet Six out
8 (16 Nov 15)	Lecture 15	Lecture 16	Problems Class Question Sheet Six in Question Sheet Seven out
9 (23 Nov 15)	Lecture 17	Lecture 18	Problems Class Question Sheet Seven in Question Sheet Eight out
10 (30 Nov 15)	Lecture 19	Lecture 20	Problems Class Question Sheet Eight in Question Sheet Nine out
11 (07 Dec 15)	Lecture 21 Revision class?	Lecture 22 Revision class?	Problems Class Revision class?

MA30087 Syllabus, assessment and feedback

Credits: 6

Level: Honours

Period: Semester 1

Assessment: EX 100%

Other work: There will be weekly question sheets. These will be set and handed in during problems classes. Any work submitted by the hand-in deadline will be marked and returned, with feedback, to you. Full solutions to all exercises will be made available.

Requisites: Before taking this unit you must take MA10207 and take MA10210.

Description: **Aims & Learning Objectives:**
Aims:
To present methods of optimisation commonly used in OR, to explain their theoretical basis and give an appreciation of the variety of areas in which they are applicable.
Objectives:
On completing the course, students should be able to

- Recognise practical problems where optimisation methods can be used effectively
- Implement appropriate algorithms, and understand their procedures
- Understand the underlying theory of linear programming problems, especially duality.

Content:
The Nature of OR: Brief introduction. Linear Programming: Basic solutions and the fundamental theorem. The simplex algorithm, two phase method for an initial solution. Interpretation of the optimal tableau. Applications of LP. Duality. Topics selected from: Sensitivity analysis and the dual simplex algorithm. Brief discussion of Karmarkar's method. The transportation problem and its applications, solution by Dantzig's method. Network flow problems, the Ford-Fulkerson theorem. Non-linear Programming: Revision of classical Lagrangian methods. Kuhn-Tucker conditions, necessity and sufficiency. Illustration by application to quadratic programming.

Information for MA50087 students

- The content, lecture and formative material of the unit is identical to that of MA30087.
- For MA50087 students, the unit has the additional aim of enabling students "To facilitate an in-depth understanding of the topic" and the additional objective of being able to "Demonstrate an in-depth understanding of the topic."
- The assessment for MA50087 students is CW 25%, EX 75%. The examination is identical to that for MA30087. The coursework is likely to take the form of directed reading enabling you to submit answers to set questions on that reading. It will most likely be set in Week 10 (30 Nov 15) with a submission date in Week 15 (04 Jan 16).