

Presentation pattern *October to June*

Module description

This module is concerned with techniques used in numerical analysis and operational research to represent real optimisation problems as mathematical models to be solved with the aid of a computer. Explaining how and when the modelling and numerical techniques can be applied, the module covers solutions of non-linear equations; systems of linear and non-linear equations and mathematical modelling; linear and integer programming; and non-linear optimisation for unconstrained and constrained minimisation problems. This module assumes knowledge of calculus (definition of differentiation and integration; differentiation and integration of various functions; Taylor's theorem with remainder; partial derivatives; and continuity and convergence) and matrices (manipulation of equations with matrices and vectors; Gaussian elimination, eigenvalues and eigenvectors; and linear dependence and independence). About a quarter of the module consists of computer activities, guided by the associate lecturer. Maxima worksheets and multimedia packages are provided.

Person specification

The person specification for this module should be read in conjunction with the [generic person specification](#) for an associate lecturer at The Open University.

As well as meeting all the requirements set out in the generic person specification, you should have:

- have a good degree (or equivalent) in mathematics, or a related subject, that includes a significant amount of content relevant to optimization;
- have experience of successful degree-level teaching preferably of operational research, numerical analysis or similar areas;
- be able to provide evidence of a complete understanding of the majority of the module materials, and demonstrate the ability and willingness to quickly develop an in-depth understanding of the remaining materials;
- have a demonstrable interest in the applications of the optimization techniques covered in the module;
- have expertise in using a computer algebra system such as Maxima;
- be able to, and be enthusiastic about, giving face-to-face and online tutorials using materials that you may need to produce, and that are appropriate for the module and students;
- have appropriate IT equipment and skills;
- be committed to keeping your skills and knowledge up-to-date;
- be able and willing to use e-learning facilities, such as:
 - the module website, and other University websites, to download essential material and to retrieve other information;
 - University systems for the purposes of monitoring students' progress;
 - e-mail and University forums for asynchronous communication with students, tutors and other staff;
 - the University's online tutorial software (training provided);
 - on-screen marking of electronically submitted student assignments (eTMAs) in pdf format.

It would be an advantage to have:

- a higher degree in a subject area relevant to optimization;

- experience of teaching mathematics at this level to adults or to students from a broad range of educational backgrounds.

Additional information

As students on this module have the choice to submit their TMAs electronically via the University's online TMA/EMA service, you will be required to mark and provide feedback on TMAs submitted electronically and to return the marked work as an electronic file, in the prescribed form, to the online TMA/EMA service. If you are invited for an interview and the latter involves an electronic marking exercise, some guidance will be given for this. Further information and advice will be available should you be appointed to the role.

The exact nature of e-learning facilities and University systems for monitoring student progress and handling TMAs will evolve in future, and you will need to be prepared to adapt accordingly. Please note that, in accordance with usual University policy, tutors will be expected to use their own equipment for all aspects of e-learning.

Module related details - a full explanation can be found on the website

Credits awarded to the student for the successful completion of a module:	30
Number of assignments submitted by the student:	4
Method of submission for assignments:	1b
Level of ICT requirements:	1
Number of students likely to be in a standard group:	15
Salary band:	2
Estimated number of hours per teaching week:	2.5