Finite-Element Modelling and Numerical Methods (CEGE0038)

Description
Fundamentals of finite-element modelling and analysis: energy method (variational formulation), Galerkin weak formulation, choice of elements and shape functions (conformity, accuracy, efficiency); mesh generation; isoparametric elements; time-stepping methods (implicit methods, explicit methods, stability); finite-difference approximation of differential equations; applications to 1D and 2D models taken from various areas of engineering: structural mechanics and dynamics (beams, frames, torsion, plates, membranes, vibration), heat/fluid flow, soil mechanics, etc.; nonlinear problems; limitations of finite-element approximation: shear and membrane locking, reduced integration, hourglassing; use of finite-element software.

Key information
- **Year**: 2019/20
- **Credit value**: 15 (150 study hours)
- **Delivery**: PGT L7, Campus-based
- **Reading List**: View on UCL website
- **Tutor**: Prof Gert Van Der Heijden
- **Term**: Term 2
- **Timetable**: View on UCL website

Assessment
- Written examination (main exam period): 70%
- Coursework: 15%
- Coursework: 15%

Find out more
For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk

Disclaimer: All information correct as of June 2019. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.
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