MSc in Soil Mechanics
(with specialisations)

Leading Geotechnical Specialist Education
for seven decades

Geotechnics Section
http://www3.imperial.ac.uk/geotechnics/
MSc in Soil Mechanics

INTRODUCTION
The internationally renowned cluster of MSc courses in Soil Mechanics at Imperial College is running in its seventh decade. The current and emeritus staff include three Rankine and five Géotechnique Lecturers. Graduates from the course hold senior positions around the world. The Geotechnics Section engages closely with the geotechnical engineering industry, ensuring that the course content is up to date and relevant to current professional practice.

AIMS
The course is designed to provide students with a solid technical basis in the key areas of geotechnics through a coherent, coordinated and balanced degree programme, integrating core engineering science and recent research with practical applications.

COURSE THEMES
The four Soil Mechanics MSc courses share approximately 80% of the curriculum, while the remaining 20% allow specialisation in the four areas listed in the left column.

DISTINCTIVE FEATURES OF THE PROGRAMME
- Strong links with industry including:
  - industry funded studentships (see back page)
  - networking with key geotechnical employers
  - guest lectures
  - one-day Offshore Geotechnics Seminar (OGS) organised by Fugro, Shell, Senergy and other industrial partners
- 11-week individual research project including hands-on work with state-of-the-art soil testing equipment and numerical analysis tools
- Emphasis on field work

FACILITIES
- Experimental laboratory: standard and osmotic oedometers, stress-path triaxial cells, hollow cylinder apparatus, temperature-controlled triaxial and conductivity cells.
- Micro-mechanical laboratory: optical microscope, interferometer, QicPic apparatus.
- Dedicated FEM laboratory: bespoke FE code ICFEP for 2D and 3D static and dynamic analysis, with thermo-hydro-mechanical coupling for saturated and unsaturated soils.
- Dedicated DEM laboratory: PFC code 2D and 3D, and be-spoke development of the LAMMPS code.
- Departmental library: the best Civil Engineering library collection of books and periodicals.
- Access to transferable skills training: a range of courses, from academic English to career services, available from the Imperial College Graduate School.
EXTRACTS FROM SELECTED MODULE CONTENTS

**Advanced Soil Properties**
- Strength and stiffness anisotropy
- Creep and ageing
- Thermal characteristics of soils

**Analysis and Constitutive Modelling**
- Classical methods of analysis
- Finite Element Modelling (FEM)
- Distinct Element Modelling (DEM)

**Embankments & Earthworks**
- Infrastructure embankments and earth dams
- Construction and maintenance
- Seasonal soil-plant-atmosphere interaction

**Foundations**
- Standard design of shallow and deep foundations
- New pile design methods—ICP
- Special: energy and offshore foundations

**Geotechnical Earthquake Engineering**
- Seismic wave propagation and site response
- Dynamic soil properties and liquefaction
- Seismic design of geotechnical structures

**Geotechnical Processes**
- Tunnelling and deep excavations
- Ground Improvement
- Field Monitoring

**Laboratory Soil Testing and Data Interpretation**
- Scope of data from various experiments
- Interpretation of mechanical parameters

**Rock Engineering**
- Intact rock and discontinuities
- Rock mass classification and strength
- Applications: rock slope stability, foundations, tunnels

**Unsaturated Soil Behaviour**
- Mechanics of unsaturated soils
- Constitutive framework
- THM behaviour for nuclear waste disposal

**MSc CORE MODULES**
- Consolidation and Seepage
- Strength and Deformation
- Laboratory and Field Techniques
- Analysis and Constitutive Modelling
- Site Investigation and Ground Models
- Embankments & Earthworks
- Stability of Soil Slopes
- Foundations
- Earth Pressures
- Geotechnical Processes
- Laboratory Testing and Data Interpretation
- Field Work
- Offshore Geotechnics Seminar (OGS)
- Individual Research Project

**MSc SPECIALISATION MODULES**
**INCLUDE**
- Engineering Geomorphology
- Unsaturated Soil Behaviour
- Advanced Constitutive Modelling
- Rock Engineering
- Advanced Soil Properties
- Contaminated Land and Groundwater
- Containment Engineering
- Geotechnical Hazards
- Geotechnical Earthquake Engineering
- Microeconomics
- Project Management

**FULL- AND PART-TIME STUDY**
The full-time programme is taken over 11 months, with a single entry point per year at the beginning of October. The part-time programme is available on a Term Release basis over 2 years.
**MSC INDUSTRY FUNDED SCHOLARSHIPS**

Our courses are supported by a group of 13 Companies whose financial contribution enables us to provide industry funded scholarship awards to our students. Funding normally covers the full fees as well as a contribution towards subsistence costs and is available to UK based students. Other funding opportunities include a number of Departmental fee scholarships.

Companies forming the scholarship group organise recruitment events and regularly recruit our MSc graduates, contributing to the excellent employability record of our graduates.

![Field course in Kent](image)

**MORE INFORMATION**

You can find more information on the Soil Mechanics Course online via:
http://www.imperial.ac.uk/civil-engineering/prospective-students/

**HOW TO APPLY**

Apply for the Course online via:
http://www.imperial.ac.uk/study/pg/apply/how-to-apply/

As a minimum applicants should have an Upper Second Class Honours degree in Civil Engineering or a related discipline from a UK university (or overseas equivalent).

**Administrator**

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