Natural and Environmental Disasters (CEGE0036)

**Description**

**Outline:**

The course broadly introduces Natural and Environmental disasters that engineers might encounter in their careers and describes the physical processes involved.

The course focuses on the dynamic physical mechanisms in Nature that create disasters that affect people and the built and natural environment on a large scale.

The Earth Ocean and Atmospheric system will be introduced and we will discuss the dynamic effects that create motion in the core, mantle, atmosphere, oceans, on rivers, snow and mud, driving almost every large scale disaster on the planet - all disasters occur because of motion, normally because of the actions rotation of the Earth and of gravity on different scales;

Topics will be selected from events such as Hurricanes, Volcanic ash dispersion, tsunamis, surge waves, oil spills, pollution release and urban heat island, industrial accidents, volcanoes, breaking dams, snow avalanches.

Earthquakes will not be covered;

This module also relates to the course on disaster risk reduction:

relating specifically to case studies from recent disaster events, which have been well documented and researched;

**Aims and Learning Outcomes:**

1. Basic grounding in Earth and Atmospheric processes;
2. Knowledge of recent major natural and environmental disasters around the world, the processes that created them, and their main impacts on human life and the built environment;
3. Understanding the risks involved with natural disasters and assessing their effects on Civil Engineering infrastructure;

**Key information**

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<th>Year</th>
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<tr>
<td>Credit value</td>
<td>15 (150 study hours)</td>
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<td>Tutor</td>
<td>Dr Liora Malki-Epshtein</td>
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**Assessment**

- Group project: 100%

**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 December 2018. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.
4. Understanding the phenomena of Hurricanes, Tsunami waves, Volcanic ash clouds and plumes, gravity driven flows and mudslides;

5. Familiarity with some of the physical principles underlying the causes of natural disasters and with various Mathematical modelling tools used to analyse disaster related processes;

5. Water waves and tsunamis;

6. Geostrophic flow, temperature and general structure of atmosphere;

7. **Atmospheric boundary layer modelling:**
   turbulence, stratification, plumes;

8. **Density driven flows such as:**
   NLG release or large scale chemical release, transport of smog, pollution, effluent, salt, related to sediment transport - lava, landslides, snow avalanches;

9. Understanding of basic physical concepts in fluid dynamics such as Conservation of energy, Conservation of mass, Conservation of momentum, Diffusion, Dispersion, Buoyancy and turbulence;
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