



**Course Title:** Energy, Technology and Innovation

**Course Coordinators:** Dr Esin Yoruk & Will McDowal (Prof. Slavo Radosevic)

**Course Code:** SEESGS65

**Credit Value:** 15 (6 ECTS)

**Runs in (2013/14):** Term 2

**Contact Hours:** 2 per week

**Open to:** MSc Energy; MA CBE, CEP, IMESS (E&B) and other qualified UCL MA students subject to availability

### Course Outline

Transition towards environmentally and energy sustainable paths of economic growth require innovation and diffusion of new technologies that are socially and economically acceptable. Participation in these processes at either policy or business level requires understanding of the basics of economics of technical change and innovation with special reference to energy and environment. This module aims to make students familiar with the major issues of the economics of technological change and innovation, and strategic technology management with special reference to energy and environment. Module focuses on:

- Key concepts and models of innovation process;
- The issues involved in measurements of technical change and innovation and interpretation of results;
- Patterns of innovation and dynamics of technical change and innovation;
- Socio-technical changes and energy transitions;
- The systemic nature of innovation and transition to sustainability;
- Microeconomics and management of innovation;
- Open innovation and innovation collaboration;
- Diffusion analysis and international technology transfer;
- Innovation policy: strategic issues;
- Innovation policy: country and sector policy analyses

### At the end of the module you should have fulfilled the following aims and objectives

- The aim of this module is to make students familiar with the major issues of the economics of technological change and innovation, and strategic technology management with special reference to energy and environment. More specifically students will:
- Learn to analyse, synthesise and critically use various indicators of technical change and innovation;
- Understand major patterns of dynamics of technical change and evaluate ongoing structural changes within that context;
- Learn how technology transitions are shaped by socio-economic factors and their mutual interactions including issues involved in transition to sustainability;
- Learn major strategic issues involved in technology management at organisational level including in open and collaborative innovation;
- Understand the major models of technology diffusion and factors involved in their design;
- Understand various options in technology policy which relate to energy and environment and how these options reflect different criteria used by different stakeholders.

### Assessment Methods

**Assessment Style:** Assessment is based on one essay of maximum 4000 words and on coursework based essay of maximum 1000 words. A coursework based essay may be produced in group, dependent on the number of students in the seminar. In preparation of coursework based essays students are required to make presentations individually or in group, dependent on the size of the seminar group.

**Assessment Weighting:** 4,000 word essay carries 80% weight + coursework (team) based essay carries 20% weight

### Feedback

Coursework: Verbal/written feedback on presentations, assessed and non-assessed coursework.

Examination: Students will be permitted access to markers' comments on individual scripts in line with the SSEES Policy on Examination Feedback.

### Preliminary Reading

- Mark Dodgson, David Gann and Ammon Salter (2008) The Management of Technological Innovation. Strategy and Practice
- Fagerberg, J., D.C. Mowery and R R Nelson (eds) The Oxford Handbook of Innovation, OUP
- Clayton M. Christensen, 1997, The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Boston: Harvard Business School Press
- Frank W. Geels (2002), Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study, Research Policy 31 (2002) 1257–1274
- Markard, J., Truffer, B., 2008. Technological innovation systems and the multi-level perspective: towards an integrated framework. Research Policy 37, 596–615.