Module Title: Hydroelectric and Marine Energy Generation	**Module Code: EV7119** **Level: 7** **Credit: 15** **ECTS credit: 7.5**	**Module Leader**: Alan Owen **Additional tutors:** Frances Hill Ruth Stevenson

Pre-requisite: none	**Pre-cursor:** none
Co-requisite: none	**Excluded combinations :** none

Location of delivery: CAT/By distance learning

The main aims of the module are to enable students to:

- Develop an informed understanding and critical appreciation of the history, technologies, policy, environmental, resources and social implications of power generation from water flows.
- Comparatively appraise the above in a holistic, objective and self-reflective manner and identify appropriate technology for a given location.

Main topics of study:

- Technological aspects of energy generation from water flow technologies
- Resource/technology matching, availability and limitations. – marine and land-based
- Policy and economics issues, planning, social and legislative aspects of energy provision from water flow technologies.

Learning Outcomes for the module

At the end of this module, students will be able to:

Knowledge

1. Demonstrate a critical understanding of the of the technologies and their selection criteria

Thinking skills

2. Critically appraise the life-cycle impacts and CO_2 implications of installation
3. Use data to assess the efficacy of the listed technologies

Subject-based practical skills

4. Systematically analyse resource availability in relation to technology selection, demand trends and grid management

Skills for employability

5. Communicate effectively (written and oral) to a team, peer or a wider audience.

Teaching/ learning methods/strategies used to enable the achievement of learning outcomes:

The theory and practice of energy from water flows is taught through lectures, seminars, practical workshops, presentations, demonstrations and tutorials. Students have access to Moodle discussion boards and to regular Skype surgeries where they can meet with their peers and a tutor to discuss any academic issue, and throughout

this process an active exchange of views and opinions is encouraged The summative coursework consists of an academic investigative essay and presentation of this.

There is a formative learning element to the module to allow the students to receive critical feedback on their work without the pressure of marked assessment.

For distance learning (DL) students, learning will be supported through Internet-based lectures, student-centred practical exercises, seminars and tutorials.

All students also have access to Moodle discussion boards and regular Skype surgeries, where they can meet with their peers and a tutor to discuss any academic issue.

Lectures onsite and through DL highlight key concepts, theory and applications, and integrate additional resources (such as journal articles). They encourage deep learning through the use of self-assessment questions which encourage students to engage with the topic, to help students understand new topics and skills.

Assessment methods which enable students to demonstrate the learning outcomes for the module:	**Weighting:**	**Learning Outcomes demonstrated:**
1. Report (2,400 words)	80%	**1,2,3,4**
2. Presentation (600 words)	20%	**5**

Reading and resources for the module:

Core

Twidell, J. and Weir, T. (2015) *Renewable Energy Resources.* 3rd edition. Taylor and Francis, Oxford. (and erratum-download)

Recommended

Harvey, A., (1993) *Micro-hydro design manual*, ITDG Publishing, (PDF available from *https://www.scribd.com/document/193276787/Micro-Hydro-Design-Manual-Adam-Harvey*)

Further relevant journals, websites and other relevant resources will be provided within reading materials that are made available for the module.

(*) Available as an e-book

Indicative learning and teaching time (10 hrs per credit):	**Activity**
1. Student/tutor interaction:	Lectures, seminars, tutorials, presentations, practicals / demonstrations **30 hours**
2. Student self learning and research time:	Seminar reading and preparation, assignment preparation, background reading, and research activities. **120 hours**
Total hours:	**150 hours**