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Micro-Credentials

Information Sheet and Descriptor

Definition (working)

A micro-credential *is a proof of the learning outcomes that a learner has acquired following a short learning experience. These learning outcomes have been assessed against transparent standards. The proof is contained in a certified document that lists the name of the holder, the achieved learning outcomes, the assessment method, the awarding body and, where applicable, the qualifications framework level and the credits gained. Micro-credentials are owned by the learner, can be shared, are portable and may be combined into larger credentials or qualifications. They are underpinned by quality assurance following agreed standards* ***(working definition approved by HCI Steering, 11 February 2021).***

Micro-credentials – range of credits from 2.5* ECTS, 5 ECTS, 10 ECTS.

*Note: for the 2021/22 academic year micro-credentials will consist of 5 ECTS or 10 ECTS.

Micro-credentials:

- Consist of credit offered for continuing/professional development purposes.
- Are specifically designed to upskill the workforce.
- May be stackable.
- Offer flexible delivery to meet the needs of industry, business and employees.

MC = Micro-Credential

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HCI Pillar 3

Micro-Credentials: Descriptor

HCI Cluster and Work Package for the proposed micro-credential:	Cluster 1: Work-package 1
To whom will the micro-credential be offered?	Specify the *specific industry/profession targeted:* The MC will be offered to professionals working in industries linked to air quality monitoring, management and reporting. This involves a cross-sectoral range of private enterprises and public sector bodies and learners will therefore have a diverse employer base.
Micro-credential title:	Air Pollution: Monitoring, Assessment & Control
Is the proposed micro-credential a new or existing module (repurposed)?	Existing module to be repurposed
(For Existing Modules Only)	
Existing module detail	***If this is an existing module to be repurposed as a micro-credential, please respond to the questions below.*** ***If not, proceed to the next section.*** State the name of the module and programme *(and enclose module descriptor if available)*: Module: Air Pollution. Programmes: MAI Engineering and MSc in Engineering (Civil) Is the module shared with another discipline/School? If so, name the discipline/School: No **Existing Module details:** PG Y5 MAI and Y1 MSc No. of ECTS of module: 5 NFQ level: 9 School (owner and discipline): School of Engineering

	Module coordinator: John Gallagher Code in SITS: CE7E03 *If changes are required to the existing module so that it can exist coherently as a micro-credential please give details (please also outline how the existing module will meet the criteria of a micro-credential in terms of meeting the needs of industry and, providing flexible delivery):* Yes	
Micro-credential information		
NFQ level (if applicable)	9	PG
ECTS	*Note: 5 ECTS: 100–125 hrs student effort (PG: 1 ECT: 25 hrs student effort)* 5	
School (owner) and discipline	School of Engineering	
MC Coordinator (name) *(Must be academic / teaching staff)*	John Gallagher	
State other Schools/external organisations involved in the delivery of the micro-credential (if applicable)	n/a	
Industry/profession	**Specify the industry/profession targeted by the micro-credential:** Working professionals in the public or private sector responsible for air quality monitoring and assessment, responsibilities in air quality reporting, or have a role in air pollution mitigation and adaptation in either the indoor or outdoor environment. **What market need is addressed by the micro-credential:** It will advance an individual's knowledge of air pollution science and their capacity to address air quality challenges at local, regional and national levels. Introduction to air quality monitoring equipment, first-hand application of several air pollution modelling techniques, and identifying air pollution mitigation solutions, and control technologies and measures in scientific literature and practical guidelines. Effective data measurement and analysis	

	can support air quality reporting in relation to meeting national (EPA) or international (WHO) standards/guidelines. **State the industry/employer-related skills addressed by the micro-credential:** • Advanced fundamental knowledge and develop capacity of individuals to effectively support air quality monitoring, assessment and control activities. • Critical analysis and modelling skills. • Environmental impact assessment. **How will the delivery of this micro-credential facilitate industry/professional staff participation (flexible delivery – online/blended/face-to-face – evenings/weekends etc)?** Blended learning during first semester, 3 hours per week, split over two afternoons, and over an 11-week semester. All content recorded for flexible learning with a discussion board to support class interaction throughout the semester, in relation to topic areas and coursework. Two field practicals will be delivered as simultaneous face-to-face and virtual sessions, on topics of (i) mobile air pollution monitoring in the built environment, and (ii) green infrastructure and passive air pollution mitigation.
Teaching staff & if appropriate institutional/industry affiliation	Name all teaching staff involved and if external, the name of the organisation. Professor John Gallagher, Prof Aonghus Mc Nabola & Dr Saniul Alam from the Discipline of Civil, Structural and Environmental Engineering.
Min./max. number of students	Min. number of students: 0 Max. number of students: 5
Mode of delivery	Blended Any further details:
MC entry & admission requirements/pre-requisites (if applicable)	Level 8 programme. 2.1 grade in Engineering or a cognate discipline
Proposed commencement date	September 2021

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Micro-credential frequency, duration and term	*Frequency of delivery during the academic year:* Once per academic year	*Duration of the MC (e.g. 6 weeks). If block delivery applies provide details:* One semester - 11 weeks	*Indicate term(s):* Michaelmas ☒ Hilary ☐ Trinity ☐
Contact and independent study hours *(include total)*	*(1 ECTS = 25 hrs) Note: contact hours also relate to online delivery.* *Contact hours: 33 (30 hours lectures, 3 hour of practicals)* *Independent study hours: 95* *Total: 125 hrs*		
Micro-credential aims	This module aims to enable students to gain an understanding of the theory and practice of Environmental Engineering in relation to air pollution.		
Micro-credential learning outcomes (approx. 5)	Resources: Academic Practice and QQI *Note: Learning outcomes should stem from and align with the MC aims and start with an explicit and assessable verb.* On successful completion of this micro-credential, learners will be able to: LO1. Describe key concepts relating to air pollution science and its application to environmental engineering. LO2. Assess, apply and evaluate differing forms of air pollution models for the prediction of concentrations in the atmosphere. LO3. Appraise differing approaches to the control of air pollution for indoor and outdoor settings and in urban and industrial settings. LO4. Discuss the development of national emissions inventories and projections, critically review these methodologies in their practice application. LO5. Measure air pollution concentrations in practice to identify the advantages and limitations of differing monitoring approaches. L06. Critically assess an environmental impact assessment of new infrastructure developments from an air pollution perspective.		
MC content areas. *(Bullet points can be used)* If the MC (or components) will be delivered in a blended format, identify the content that will be delivered online.	The module commences with an introduction to the field of air pollution science, identifying the current challenges in the field and key background knowledge in the provision of clean air for society and the environment. The module explores the use of air pollution modelling to predict concentrations in various settings and to assess the impacts of policy changes, new technology or developments. The module also explores the control of air pollution in outdoor and indoor conditions from an environmental engineering perspective with a particular focus on sustainable approaches.		

<table>
<tr><td></td><td>We examine the development of national emissions inventories and the projection of pollution into the future using forecasting techniques. We examine the physical measurement of air pollutants using field equipment.

The module deals with the development of environmental impact assessment in relation to air pollution in infrastructure developments, using several case studies (e.g. incineration, construction projects, roads, etc).</td></tr>
<tr><td>Teaching and Learning Methods (state pedagogical approach).

Include the online environment(s) to deliver the MC e.g. Blackboard/Zoom, if appropriate.</td><td>Resources: Academic Practice

All lectures will be delivered live from a lecture theatre (face-to-face) format on Monday (2-3pm) and Tuesday (3-5pm) afternoons during the first semester, with remote access via Blackboard Collaborate and all sessions will be recorded. As such this blended course will apply flipped classroom components for face-to-face students and groups online, combining traditional lecture formats for student tasks and promoting peer-learning. Discussion boards will be provided for virtual students who have limited interaction with the class in the lecture theatre, to allow for questions related to topic areas covered and coursework.

Two field practicals (live and recorded sessions, simultaneously available face-to-face and virtually) will provide hands-on experience of air quality science to ground fundamentals and context for some coursework and lecture material.

Coursework provides opportunity to demonstrate independent learning through developing new skills (reviewing literature) and using new tools (air quality modelling software). Feedback provides further opportunity to learn.</td></tr>
<tr><td>MC assessment components

Please include the following…

How will the MC be assessed?

Indicate the LO assessed for each assessment (e.g. LO1 etc.)

Indicate the % of overall mark each assessment is worth.

Indicate if summative/formative (e.g. essay/research paper)</td><td>
<table>
<tr><th>Assessment Component</th><th>Assessment Description</th><th>LOs addressed</th><th>% of total</th></tr>
<tr><td>Examination</td><td>Take home examination (3 hrs)</td><td>LO1,LO2,LO3,LO4,LO5,LO6</td><td>60%</td></tr>
<tr><td>Assignments</td><td>3 assignments covering the module syllabus: Personal Exposure Monitoring, Assessment & Modelling (20%, 20-page limit); Background & Regional Air Quality (10%, 10-page limit); Literature Review (10%, 1,500-2,000 words).</td><td>LO4,LO5,LO6</td><td>40%</td></tr>
</table>
</td></tr>
<tr><td>State how the MC will be reassessed if failed</td><td>100% examination (3 hrs)</td></tr>
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Pass standard & any special requirements for passing the MC	Resources: Calendar II and Calendar III 50% pass mark
Penalties for late submission	
Core reading (if applicable)	Environmental Engineering, G. Kiely (Chapter 8) Air Pollution: from a local to a global perspective. Fenger & Tjell Air Pollution Control Engineering. De Nevers. 2nd Ed. An Introduction to Air Pollution. Vallero. 4th Ed.
Are there subject experts in other Schools/disciplines?	No If yes, name of School and discipline Click or tap here to enter text. Has the MC been discussed with the School/discipline and DUTL/DTLP? Choose Yes/No
Proposed student fee	External student fee €1,500

Faculty Dean and School Executive Approval:

Date of approval of the proposed micro-credential by the School Executive: 13/04/2021

Date of approval of financial information by Faculty Dean: 12.05.2021

Signed by Head of School:

Date: 15/04/2021

Faculty Dean:

Date: 12.05.2021