

Module Code	CE7C04
Module Name	C4: Façade Engineering
ECTS Weighting¹	5 ECTS
Semester taught	Semester 1
Module Coordinator/s	Module Co-ordinator: Adj. Prof. Patrick Shiel (shielp@tcd.ie) Lecturer(s): Prof. Patrick Shiel Prof. Roger West Prof. Brian Broderick Prof. Barry McAuley Mr. Anthony McAuley, ARUP Mr. Kevin Furlong, TUD
<u>Module Learning Outcomes</u> with reference to the <u>Graduate Attributes</u> and how they are developed in discipline	<p>On successful completion of this module, students will be able to analyse, design and/or synthesise in the following topics:</p> <p>LO1. Thermal performance of buildings LO2. Designing buildings for the occupants - Regulatory Requirements LO3. Historical and present day building facades LO4. Façade design and retrofitting of facades for improved performance LO5. Façade structures, systems and construction LO6. Designing A-Rated or Nearly Zero Energy Buildings (NZEB) LO7. Façade/envelope design using Revit, and analysis using building energy software</p> <p>Graduate Attributes: levels of attainment</p> <p>To act responsibly – knows how to deal with ambiguity To think independently – thinks critically and appreciates knowledge beyond their chosen field To develop continuously – is a problem solver and easily adapts to change To communicate effectively – can become expert in the communications tools of the engineering discipline</p>

Module Content	The module is focused on building façade engineering including design, construction and analysis of the building envelope, including façade thermal characteristics and building physics. The façade/building envelope project will be developed using Revit, and the chosen envelope analysed using suitable building energy simulation software, such as Sustainable Energy Authority of Ireland's (SEAI) Simplified Building Energy Model system (SBEM).							
Teaching and Learning Methods	Lectures, tutorials and project work. Including lectures given by industry partners such as IES, ARUP, Architects and training on Autodesk's Revit and SEAI's SBEM are all included.							
Assessment Details² Please include the following: <ul style="list-style-type: none"> • Assessment Component • Assessment description • Learning Outcome(s) addressed • % of total • Assessment due date 	Assessment Component	Assessment Description	LO Addressed	% of total	Week due			
		Written examination [3 hours]		50%				
		Interim report		10%				
		Final Project Report		25%				
		Final Presentations		15%				
Reassessment Requirements	Examination [3 hours] – 100%							
Contact Hours and Indicative Student Workload²	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td data-bbox="667 1381 1495 1465">Contact hours: 3 hours lectures per week</td> </tr> <tr> <td data-bbox="667 1465 1495 1591">Independent Study (preparation for course and review of materials):</td> </tr> <tr> <td data-bbox="667 1591 1495 1747">Independent Study (preparation for assessment, incl. completion of assessment):</td> </tr> </table>					Contact hours: 3 hours lectures per week	Independent Study (preparation for course and review of materials):	Independent Study (preparation for assessment, incl. completion of assessment):
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Independent Study (preparation for assessment, incl. completion of assessment):								

Recommended Reading List	<p>Reading content will be posted to the class Blackboard Area. These will include relevant papers, user guides and background literature and documentation. The following textbooks are recommended;</p> <ul style="list-style-type: none"> • J. Lovell, <i>Building Envelopes: An Integrated Approach</i>. Princeton Architectural Press, 2010 • Watts, <i>Modern Construction Envelopes</i>. Springer, 2011. • <i>Energy Manual, Sustainable Architecture</i>. Detail, Birkhauser, 2008 • M. Patterson, <i>Structural Glass Facades and Enclosures</i>. John Wiley & Sons, 2011.
Module Pre-requisite	
Module Co-requisite	
Module Website	
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	No
Module Approval Date	
Approved by	
Academic Start Year	28 th September 2021
Academic Year of Date	2021/2022