Module Code	ME5B10
Module Name	Instrumentation and Experimental Techniques
ECTS Weighting[1]	5 ECTS
Semester taught	Semester 2
Module Coordinator/s	Asst. Prof. Dermot Geraghty
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	On successful completion of this module, students should be able to: LO1 Evaluate uncertainty in measurements using the ISO Guide to Uncertainty in Measurement LO2 Implement a data acquisition system using LabView and the National Instruments myDAQ or other data acquisition system. LO3 Specify and select an appropriate data acquisition system for a given application LO4 Appreciate practical aspects of data acquisition especially signal conditioning which influence the signal to noise ratio achieved for a measurement LO5 Design a basic Sound Level Meter and assess its performance LO6 Understand the application areas and limitations of some commonly used sensors e.g. strain gauges, temperature and humidity sensors, microphones and sensors for measurement of electrical quantities. **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Enhanced To develop continuously - Enhanced To communicate effectively - Enhanced

Module Content	This module focuses on the design and selection of data acquisition systems using LabView and the National Instruments myDAQ as a basis for the design of a bespoke data acquisition system using modern approaches. A significant part of the module is the design of an environmental sound level meter using Labview. This assignment covers many aspects of practical data acquisition as well as giving students the opportunity to become proficient in LabView programming. The module also includes an in depth study of the methods for uncertainty analysis as described in the ISO Guide to Uncertainty in Measurement as practiced in National Standards Laboratories and in traceable calibration facilities. A guest lecture by an NSAI scientist supports this component of the course.
Teaching and Learning Methods	This module uses Blackboard, podium lectures, LabView training sessions and a Labview based data acquisition assignment, to help students achieve the required learning outcomes. In the current Covid-19 situation or in a new lockdown situation, the following changes to the normal teaching methods apply: 1. All lectures and tutorials will be delivered online. 2. Recorded lectures will be available on Blackboard 3. The end of semester exam will be online.

Assessment Details[2]

Please include the following:

- **Assessment Component**
- **Assessment description**
- **Learning Outcome(s) addressed**
- **% of total**
- **Assessment due date**

Assessment Component	Assessment Description	LO Addressed	% of total	Week due (provisional)
Written Examination	End of Semester examination	LO1-LO6	60%	Exam Period
Design Assignment	Weeks 22-28	LO1-LO5	40%	Week 29

Reassessment Requirements	Written Examination
Contact Hours and Indicative Student Workload[2]	**Contact hours: 41 (33 Lectures, 4 LabView sessions, 4 Problem solving sessions, Guest Lectures)** **Independent Study (preparation for course and review of materials): 33 (1 hour per lecture)**

	Independent Study (preparation for assessment, incl. completion of assessment): 40
Recommended Reading List	Theory and Design for Mechanical Measurements by Richard Figliola and Donald E. Beasley. E-book available in the College Library
Module Pre-requisite	None
Module Co-requisite	None
Module Website	None
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	
Academic Year of Date	