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| **Module Code** | MEU33B05 |
| **Module Name** | Mechanics of Machines |
| **ECTS Weighting** | 5 ECTS |
| **Semester taught** | Semester 2 |
| **Module Coordinator/s** | Professor Ciaran Simms |
| **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:<br><br>LO1. Apply the principles of mechanics and 2D vector analysis to real machine configurations and human body motion.<br>LO2. Analyse common elements in machine design and human motion.<br>LO3. Apply and develop computer programmes to study kinematics and dynamics of linkages and machines.<br>LO4. Understand how to account for the effects of friction and balancing requirements in common machine components.<br><br>**Graduate Attributes: levels of attainment**<br>To act responsibly - Enhanced<br>To think independently - Enhanced<br>To develop continuously - Enhanced<br>To communicate effectively - Enhanced |
| **Module Content** | This module addresses the theory and application of mechanics to machine configurations. This includes engines, whole body human and vehicle motion, linkages and friction devices. Together with the accompanying Mechanics of Solids module, the analysis provides the link between component motion and the resulting internal stresses due to inertia and contact forces. Modelling and computing skills are developed together with the use of vector and matrix algebra in the analysis of rigid body problems.<br><br>This module completes the essential requirements of an Engineer in the machine dynamics area and prepares students for project work focused on mechanics of linkages and machines and also human movement. This subject also provides a good basis for the study of multibody dynamics, robotics and biomechanics. It builds on earlier introductory modules in mechanics, mathematics and programming. |

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| **Teaching and Learning Methods** | This module uses Blackboard, in person lectures, self-directed assignments and tutorials to help students achieve the required learning outcomes. |

**Assessment Details**
**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) |
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| Written examination | End of semester examination | 1-4 | 80 | Exam period |
| Assignments | Software based assignments | 1-3 | 20 | Staggered in Weeks 2-8 |

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| **Reassessment Requirements** | Written Examination |

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| **Contact Hours and Indicative Student Workload**Error! Bookmark not defined. | **Contact hours: 44 (33 Lectures, 11 tutorials)**<br>**Independent Study (preparation for course and review of materials): 30**<br>**Independent Study (preparation for assessment, incl. completion of assessment): 46** |
| **Recommended Reading List** | • Kinematics and Dynamics of Machines, CE Wilson and J.P. Sadler (Pearson Prentice Hall)<br>• Dynamics , JL Meriam (Wiley) |
| **Module Pre-requisite** | MEU11E07 Mechanics |
| **Module Co-requisite** | NA |
| **Module Website** | |
| **Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.** | No |

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| **Module Approval Date** |
| **Approved by** |
| **Academic Start Year** |
| **Academic Year of Date** |