

APPROVED**MECH8009: IPD Laboratories 1**

Module Details	
Module Code:	MECH8009
Title:	IPD Laboratories 1 APPROVED
Long Title:	Innovative Product Development
NFQ Level:	Advanced
Valid From:	Semester 1 - 2022/23 (September 2022)
Duration:	1 Semester
Credits:	5
Field of Study:	5211 - Mechanical Engineering
Module Delivered in:	4 programme(s)
Module Description:	This Laboratory-based module will cover the progressive development and application of multidisciplinary engineering product conception, assessment, systematic design, commercial investigation and engineering/business interdisciplinary teamwork management skills. An action learning laboratory and workshop approach is employed with product research and advancement centred on safety, sustainability and engineering ethical considerations demonstrated through the iterative development of project presentation skills.

Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
LO1	Devise and progress a self-initiated product innovation and development group project.
LO2	Apply core mechanical, biomedical and product design engineering competencies to the progressive development and advancement of an innovative product.
LO3	Assess and employ safety, sustainability and engineering ethical considerations in product development and commercial exploitation.
LO4	Demonstrate collaboration and conflict management, team communication and team decision making skills.
LO5	Develop and apply progressive engineering and commercial investigation presentations.
LO6	Submit formal project report and exhibition standard promotional material on innovative project development and commercial assessment.
Dependencies	
Module Recommendations	
Mechanical Design (CAE), Mechanical Materials (2D) , Mechanics of Machines , Thermodynamics (Laws and Cycles), Fluid Mechanics	
Incompatible Modules	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
No requirements listed	

Indicative Content
Foundation and Safety Workshop n/a
Communications 1 – Teamwork Skills n/a
Communications 2 - Product Conception n/a
Selection and Assessment of Devised Project Options n/a
Mechanical/Business Interdisciplinary Teams Formation and Management n/a
Innovative Project Presentation Methodology and Case Studies n/a
Systematic Design / Commercial Assessment Workshop n/a
Project Management Industrial Seminar - Project and Relationship Management in a Multi-disciplinary Innovative Environment n/a
Applied Project Engineering Advancement Laboratories n/a
Sustainability and Engineering Ethics Laboratory n/a
Round-Table Workshops on Group Devised Innovative Projects – Project Selection and Planning / Teamwork Development n/a
Systematic Design and Project Management Progression n/a
Round-Table Workshops - Safety Report Preparation and Project Review n/a
Product Pitch to and Feedback from Entrepreneur and Start-Up Innovation Managers n/a
IP and MTU Patenting Processes - Commercialisation Specialist n/a
Innovative Project Development and Commercial Assessment Progressive Advancement n/a

Module Content & Assessment	
Assessment Breakdown	%
Coursework	100.00%

Assessments

Coursework

Assessment Type	Presentation	% of Total Mark	10
Timing	Week 3	Learning Outcomes	1,4,5
Assessment Description Project Options			
Assessment Type	Presentation	% of Total Mark	15
Timing	Week 6	Learning Outcomes	1,2,4,5
Assessment Description Project Objectives / Systematic Design			
Assessment Type	Oral Examination/Interview	% of Total Mark	15
Timing	Week 8	Learning Outcomes	2,3,4,6
Assessment Description Round Table Forum - Safety Assessment			
Assessment Type	Presentation	% of Total Mark	15
Timing	Week 9	Learning Outcomes	2,3,4,5
Assessment Description Sustainability, Safety and Engineering Ethics			
Assessment Type	Presentation	% of Total Mark	15
Timing	Week 10	Learning Outcomes	1,2,5,6
Assessment Description Project Development / Commercial Assessment			
Assessment Type	Written Report	% of Total Mark	30
Timing	Week 13	Learning Outcomes	1,2,4,6
Assessment Description Project Development / Commercial Assessment			
No End of Module Formal Examination			
Reassessment Requirement			
Coursework Only <i>This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.</i>			

Module Workload

Workload: Full Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lab	Contact	Laboratory	Every Week	5.00	5
Independent & Directed Learning (Non-contact)	Non Contact	Self Directed Study	Every Week	2.00	2
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					5.00

Workload: Part Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lab	Contact	Laboratory	Every Week	5.00	5
Independent & Directed Learning (Non-contact)	Non Contact	Self Directed Study	Every Week	2.00	2
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					5.00

Module Resources

Supplementary Book Resources
Trott P.. (2016), Innovation Management and New Product Development, 6th. Prentice Hall, [ISBN: 1292133422].
O'Kane B.. (2018), Starting a Business in Ireland, 7th. Oak Tree Press, [ISBN: 1 904 887 35X].
Kiyosaki R.T.. (2017), Rich Dad Poor Dad, 2nd. Plata Publishing, [ISBN: 1612680194].
Jolly A. (2013), From Idea to Profit: How to Market Innovative Products and Services, 3rd. Kogan Page, [ISBN: 0 7494 4219 0].
Clason G.S.. (2013), The Richest Man in Babylon, Megaladon, [ISBN: 0553110877].
Tracy B.. (2010), Goals, 2nd. Berrett-Koehler, [ISBN: 1605094113].
Drafke M.. (2008), The Human Side of Organizations, 10th. Prentice Hall, [ISBN: 9332559422].
Jolly A.. (2012), Handbook of European Intellectual Property Management, Kogan Page, [ISBN: 0 7494 4151].
Peake S.. (2018), Renewable Energy - Power for a Sustainable Future, 4th. Oxford University Press, [ISBN: 0198759754].
Boyle G.. (2004), Renewable Energy - Power for a Sustainable Future, 2nd. Oxford University Press, [ISBN: 0199261784].
Sloane P.. (2006), The Leader's Guide to Lateral Thinking Skills: Unlocking the Creativity and Innovation in You and Your Team, Kogan Page, [ISBN: 0 7494 4797 4].
Wilson C.C., Kennedy, M.E., Trammell C.J.. (1995), Superior Product Development: Managing the Process for Innovative Products, Blackwell Publishing, [ISBN: 1 5578 6509 0].
Goodno B.J.; Gere J.M.. (2017), Mechanics of Materials, 9th. Nelson Engineering, [ISBN: 1337093343].
Ugural A.C., Fenster S.K.. (2019), Advanced Mechanics of Materials and Applied Elasticity, 6th. Prentice Hall, [ISBN: 0134859286].
Malone M.. (2002), Betting it All: The Entrepreneurs of Technology, Wiley, [ISBN: 0 471 20190 1].
Lynn G., Reilly R.. (2002), Blockbusters: The Five Keys to Developing Great New Products, Harper Collins, [ISBN: 0 06 008473 1].
Boyle G. et al.. (2012), Energy Systems and Sustainability - Power for a Sustainable Future, 2nd. Oxford University Press, [ISBN: 0199593744].
Twidell J.. (2005), Renewable Energy Sources, 2nd. Taylor & Francis, [ISBN: 0419253300].
Dally J.W., Riley W.F.. (2005), Experimental Stress Analysis, College House Enterprises, [ISBN: 0 9762 4130 7].
Boresi A.P. et Al. (2010), Advanced Mechanics of Materials, 3rd. Wiley, [ISBN: 0 4717 0126 2].
Hearn E.J.. (1997), Mechanics of Materials Volume 2, 3rd. Butterworth Heinemann, [ISBN: 0 7506 3266 6].
Cook R.D., Malkus D.S., Plesha M.E.. (2007), Concepts and Applications of Finite Element Analysis, 4th. Wiley, [ISBN: 0 4718 4788 7].

This module does not have any article/paper resources

Other Resources

Website, The Human Side of Organizations Website,
<http://www.prenhall.com/drafke>

Website, Enterprise Ireland Website,
<http://www.enterprise-ireland.ie>

Website, Starting a Business in Ireland Website,
<http://www.startingabusinessinireland.co m>

Website, Engineers Ireland. Code of Ethics and bye-laws,
<http://www.engineersireland.ie/about-us/ governance/code-of-ethics-and-bye-laws/>

Website, Irish Technology User Website,
<http://www.techcentral.ie>

Website, Irish Patents Office Website,
<http://patentsoffice.ie>

Website, European Patents Office Website,
<http://www.epo.org>

Website, Irish Venture Capital Association Website,
<http://www.ivca.ie>

Website, Engineering Fundamentals Website - Stress Analysis,
http://www.efunda.com/formulae/solid_mec hanics/mat_mechanics/stress.cfm

Website, Engineers Edge Website - Mechanics of Materials,
http://www.engineersedge.com/mechanics_m aterial_menu.shtml

Website, ANSYS Finite Element Website,
<http://www.ansys.com>

Website, Finite Element Demonstration Room Website,
[http://www.harwell.ansys.com/demoroom/.](http://www.harwell.ansys.com/demoroom/)

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_EBIOM_8	Bachelor of Engineering (Honours) in Biomedical Engineering	-1	Mandatory
CR_EMECH_8	Bachelor of Engineering (Honours) in Mechanical Engineering	-1	Mandatory
CR_ESMPR_8	Bachelor of Engineering (Honours) in Smart Product Engineering	-1	Mandatory
CR_EPRDD_8	Certificate in Product Design and Development	-1	Mandatory