

2022 -2023 BE Mechanical Engineering Syllabus

<i>Requisite Type:</i>	<i>Module Code</i>	<i>Module Name</i>	<i>ECTS Credits</i>	<i>Taught in Semester 1, 2, or Full Year</i>	<i>Examined/ Submitted in Semester(s)</i>	<i>Duration of exam (hours)</i>	<i>Lectures Shared With:</i>	<i>Bonded with:</i>
(1BM1) First University Examination in Engineering (Mechanical)								
	CH140	Engineering Chemistry	5	1	1	2 + c/a	All BE Programmes	
	CT1110	Engineering Computing I	5	1	1	2 + c/a	All BE Programmes, BCM	
	EI160	Engineering Graphics	5	1	1	2 + c/a	All BE Programmes, BCM	
	MA140	Engineering Calculus	5	1	1	2 + c/a	All BE Programmes	
	MP120	Engineering Mechanics	5	1	1	2 + c/a	All BE Programmes	
	EI140	Fundamentals of Engineering	10	1 & 2	1 + 2	2 + c/a	All BE Programmes	
	CT1111	Engineering Computing II	5	2	2	2 + c/a	All BE Programmes	
	EI150	Engineering Design	10	2	2	c/a	All BE Programmes, BCM	
	MM140	Engineering Mathematical Methods	5	2	2	2 + c/a	All BE Programmes	
	PH140	Engineering Physics	5	2	2	2 + c/a	All BE Programmes	
<p><i>TOTAL FOR THE COMPUTATION OF HONOURS = 60 ECTS c/a indicates continuous assessment</i></p> <p><i>*This module is a course requirement: Students must achieve a minimum of 40% in this module. It cannot be passed by compensation.</i></p>								

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(2BM1) Second University Examination in Engineering (Mechanical)									
	EE231	Electronic Instrumentation and Sensors	5	1	1	2 + c/a	All BE Progs		
	MA2101	Mathematics and Applied Mathematics I	5	1	1	2 + c/a	All BE Progs		
	ME223	Thermodynamics & Fluid Mechanics	5	1	1	2 + c/a	2BM, 2BSE, 2BE		
	ME2106	Theory of Machines & CADD	5	1	1	2 + c/a	2BG, 3BSE		
	ST1100	Engineering Statistics	5	1	1	2 + c/a	All 2 nd Eng		
	ME2105	Manufacturing Technology & CAIRDE	5	1&2	2	2 + c/a	2BG		
	CE227	Strength of Materials	10	1 & 2	2	2 × 2 + c/a	2BG, 2BE, 2BCM, 2BSE		
	BME2100	Materials I	5	2	2	2 + c/a	2BG		
	EE230	Electrical Circuits and Systems	5	2	2	2 + c/a	2BP, 2BLE, 3BEE, 2BSE		
	MA2102	Mathematics and Applied Mathematics II	5	2	2	2 + c/a	All BE Progs		
	ME5105	Fundamentals of Operations Engineering	5	2	2	2 + c/a	2HF1, 1AP, 2BCM	IE228, ME522	
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Incoming third year students will automatically be enrolled in the third year of the integrated 5-year programme- BE and ME in Mechanical Engineering (3BM1 is the 3rd year code and students will progress to 4BM1 for their 4th year, and then MEME in their 5th Year)

Students who wish not to do so, will be enrolled on the third year of the 4-year programme- BE in Mechanical Engineering (3BM4 is the 3rd year code, and students will progress to 4BM4 for their 4th year)

This process takes place at the start of Semester 1.

2022 -2023 BE Mechanical Engineering Syllabus

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(3BM1) Third University Examination in Engineering (Mechanical) <i>Integrated 5-Year BE & ME Programme</i>								
Core Modules								
	EE3101	Electromechanical Power Conversion	5	1	1	2 + c/a	3BLE, 3BSE	
	ME301	Fluid Dynamics	5	1	1	2 + c/a	3BG, 3BSE	
	ME304	Mechanical Analysis and Design	5	1	1	2 + c/a	3BG, 3BSE, 4BEE	
	ME322	Thermodynamics & Heat Transfer	5	1	1	2 + c/a	3BSE, 4BG	
	EE352	Linear Control Systems	5	1	1	2 + c/a	3BLE	
	BME3132	Finite Element Methods in Eng 1	5	1	1	2 + c/a	2BG	
	ME3107	Machine Design Project	10	2	2	c/a		
	ME312	Automated Systems	5	2	2	2 + c/a	3BG1, 4BG4, 4BM4,	
	ME352	Mechanical Vibrations	5	2	2	2 + c/a	4BM4	
	ME431	Systems Reliability	5	2	2	2 + c/a	3BM1, 4HF2, 4BSE, 1APE1	IE444
	ME353	Quality Systems	5	2	2	2 + c/a	4BM4	
TOTAL FOR THE COMPUTATION OF HONOURS = 60 ECTS								
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2022 -2023 BE Mechanical Engineering Syllabus

Requisite Type:	Module Code	Module Name	ECTS Credits	Taught in Semester 1, 2, or Full Year	Examined/ Submitted in Semester(s)	Duration of exam (hours)	Lectures Shared With:	Bonded with:
(3BM4) Third University Examination in Engineering (Mechanical) 4-Year BE Programme only								
Core Modules								
	EE3101	Electromechanical Power Conversion	5	1	1	2 + c/a	3BLE, 3BSE	
	ME301	Fluid Dynamics	5	1	1	2 + c/a	3BG, 3BSE	
	ME304	Mechanical Analysis and Design	5	1	1	2 + c/a	3BG, 3BSE, 4BEE	
	ME322	Thermodynamics & Heat Transfer	5	1	1	2 + c/a	3BSE, 4BG	
	EE352	Linear Control Systems	5	1	1	2 + c/a	3BLE	
	BME3132	Finite Element Methods in Eng I	5	1	1	2 + c/a	2BG	
	CT3112	Professional Skills (<i>online module</i>)	5	2	2	c/a	4BM1, 3BCT, 3BLE1	
	ME3109	Mechanical Professional Experience Programme*	20	2	2	c/a		
Choose 5 ECTS from the following :								
	ME3104	Intro to Regulatory Affairs in Manufacturing (<i>online module</i>)	5	2	2	c/a	4BM1, 3BG	
	ME3102	Project Management for Engineers (<i>online module</i>)	5	2	2	c/a	4BM1, 3BG, 3BP, 3BSE	
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(4BM1) Fourth University Examination in Engineering (Mechanical) <i>Integrated 5-Year BE & ME Programme</i>								
Core Modules								
	ME4109	Materials II	5	1	1	2 + c/a	4BG, 4BSE, SPE	
	ME4112	Computational Fluid Dynamics	5	1	1	2 + c/a	4BG, SPE, MEB, MEME, MEES	
	BME5104	Finite Element Methods 2	5	1	1	2 + c/a	4BG, SPE, MEB, MEME, MEES	
	ME424	Energy Conversion	5	1	1	2 + c/a	4BSE	
	ME402	Adv Mechanical Analysis and Design	5	1	1	2 + c/a	SPE, MEES	
	ME4111	Mechanical Professional Experience Programme*	20	2	2	c/a		
	CT3112	Professional Skills (<i>online module</i>)	5	2	2	c/a	3BCT, 3BLE1	
Choose 5 ECTS from the following Semester 1 Options**								
	ME4105	Safety Engineering	5	1	1	2	1OP1, 1HH1, 1AP1, 1AP2, 2AP2	IE522
	EE450	Power Systems (rotates annually with EE4100)	5	1	1	2 + c/a	4BSE	
	BME400	Biomechanics	5	1	1	2 + c/a	4BG, MBM	
Choose 5 ECTS from the following Semester 2 Options**								
	ME3104	Intro to Regulatory Affairs in Manufacturing (<i>online module</i>)	5	2	2	c/a	4BM1, 3BG	
	ME3102	Project Management for Engineers (<i>online module</i>)	5	2	2	c/a	4BM1, 3BG, 3BP, 3BSE	
TOTAL FOR THE COMPUTATION OF HONOURS = 60 ECTS <i>c/a indicates continuous assessment</i>								
*This module is a course requirement: Students must achieve a minimum of 40% in this module. It cannot be passed by compensation.								
**Students must abide by the grouping quotas below for optional modules. Note the student registration system does not define the groupings, thus the students are required to ensure compliance with the groupings as stated here.								

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<i>Requisite Type:</i>	<i>Module Code</i>	<i>Module Name</i>	<i>ECTS Credits</i>	<i>Taught in Semester 1, 2, or Full Year</i>	<i>Examined/ Submitted in Semester(s)</i>	<i>Duration of exam (hours)</i>	<i>Lectures Shared With:</i>	<i>Bonded with:</i>
(4BM4) Fourth University Examination in Engineering (Mechanical) 4-Year BE Programme only								
Core Modules								
	ME4103	Mechanical Engineering Fourth Year Project *	10	1 & 2	2	c/a		
	ME4109	Materials II	5	1	1	2 + c/a	4BG, 4BSE, SPE	
	ME4112	Computational Fluid Dynamics	5	1	1	2 + c/a	4BG, SPE, MEB, MEME, MEES	
	BME5104	Finite Element Methods 2	5	1	1	2 + c/a	4BG, SPE, MEB, MEME, MEES	
	ME424	Energy Conversion	5	1	1	2 + c/a	4BSE	
	ME402	Adv Mechanical Analysis and Design	5	1	1	2 + c/a	SPE, MEES	
	EE450	Power Systems <small>(rotates annually with EE4100)</small>	5	1	1	2 + c/a	4BSE	
	ME4106	Machine Design Project	5	2	2	c/a		
	ME312	Automated Systems	5	2	2	2 + c/a	3BG1, 4BG4, 3BM1,	
	ME352	Mechanical Vibrations	5	2	2	2 + c/a	4BM4	
Choose 5 ECTS from the following Industrial Systems Semester 2 Options**								
	ME431	Systems Reliability	5	2	2	2 + c/a	3BM1, 4HF2, 4BSE, 1APE1	IE444
	ME353	Quality Systems	5	2	2	2 + c/a	4BM4	
TOTAL FOR THE COMPUTATION OF HONOURS = 60 ECTS								
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*This module is a course requirement: Students must achieve a minimum of 40% in this module. It cannot be passed by compensation.								
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2022 -2023 ME Mechanical Engineering Syllabus

ME IN MECHANICAL ENGINEERING (one academic year, 60 ECTS)

Students must take:

15 ECTS Project/Thesis PLUS 25 ECTS core (mandatory) Advanced Modules PLUS 20 ECTS Optional modules, where at least 10 ECTS must be from specialist groupings, and at least 5 ECTS from transferrable skills modules.

Students must abide by the grouping quotas below for optional modules. Note the student registration system does not define the groupings, thus the students are required to ensure compliance with the quotas before teaching begins.

Students cannot take a module where they have already completed coursework of a similar content and standard.

BME5104 and ME4112 must be chosen if it (or an equivalent) has not already been taken at undergraduate level. Discuss with Programme Director if you did not complete these modules and believe you do not need to. Knowledge and software covered in these modules is used in other mandatory modules in this programme.

Module availability is NOT guaranteed. Please consult with Mech Eng discipline office before registration. Selection of modules may depend upon:

- Availability of the module in the academic year of study.
- Timetabling constraints with respect to other modules chosen.
- Completion of pre-requisite or co-requisite modules, or other required modules as identified by the Programme Director.

Requisite: Prereq Coreq Exreq	Module Code	Module Name	ECTS	Taught in Semester 1, 2, or Full Year	Examined/ Submitted in Semester(s)	Duration of exam (hours)	Lectures Shared with:	Bonding	Taken in BM NUI Galway (this column will be removed)
Project Thesis									
	ME5110	Mechanical Engineering Masters Year Individual Project*	15	1 & 2	1 & 2	Thesis + c/a			No
Core Advanced Mechanical Modules (25 ECTS)									
	ME516	Advanced Mechanics of Materials	5	2	2	1 + c/a	MEB, MEES,MBM		No
	ME521	Research Methods for Engineers	5	1	1	c/a	APE MEB, MEES		No
	ME5106	Advanced Manufacturing	5	2	2	2 + c/a			No
ME4112	ME426	Turbomachines & Advanced Fluid Dynamics	5	2	2	2 + c/a	4BSE, MEES, 4BM		No
	ME5111	Engineering Acoustics: Noise and Sustainable Development	5	2	2	2 + c/a			No
Optional Specialist Modules (choose 10-15 ECTS)									
	CT4101	Machine Learning	5	1	1	2 +c/a	BCT		No

2022 -2023 ME Mechanical Engineering Syllabus

BME5104	BME501	Advanced Finite Element Methods	5	2	2	2 + c/a	MEB, MEES		No
	EE6102	Power Systems (rotating)	5	1	1	2 +c/a	MEEE	EE410 0	No (Rotating)
	BME5100	Advanced Computational Biomechanics	5	1	1	c/a	MEB		No
	EG5101	Advanced Energy Systems Engineering	5	1	1	c/a	MEES	EG400	Not from 16-17
	ME5171	Combustion Science & Engineering	5	2	2	2 +c/a	MEES, 4BSE 4BM1	ME410 1	Option 4BM
	MP410	Non-Linear Elasticity	5	1	1	2 + c/a			
	EE5127	Internet of Things Systems Design	5	1	1	c/a			No
Optional Transferrable Skills Modules (choose 5 – 10 ECTS)									
	AY872	Financial Management I	5	1	1	2			No
	ME432	Technology, Innovation & Entrepreneurship	5	1	1	c/a	APE, MEES 4BM1		No
	IE5100	Physical Ergonomics	5	1	1	2 + c/a	OEH, OES	IE520	No
	ME572	Human Reliability	5	2	2	2 + c/a	4BG, APE,MEB	IE444	No
	IE450	Lean Systems	5	1	1	2	MEB, MEES		No
	IE446	Project Management	5	1	1	c/a	APE		No
Optional modules for external students only (choose 5 – 10 ECTS in place of any optional modules)									
	ME4112	Computational Fluid Dynamics	5	1	1	2	MEME, MEES	BME6 101	Core 4BM
	BME5104	Finite Element Methods in Engineering II	5	1	1	2	MEME, MEES	BME6 101	Core 4BM
BME2100	ME4109	Materials II	5	1	1	2 +c/a	4BM, 4BG		Core 4BM
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