

# MECH H1607: Mechanics of Machines 1

Credits:       10         NFQ Level:       6         Module Delivered In       No Programmes         Teaching & Learning       Lectures, tutorials along with self-directed study and practical exercises.         Strategies:       To provide the student with an understanding of the underlying scientific principles of Mechanical Engineering         Consumers       To provide the student with an understanding of the underlying scientific principles of Mechanical Engineering         Learning Outcomes       To provide the learner should be able to:         Con successful completion of this module the learner should be able to:       Consumers         Con successful completion of this module the learner should be able to:       Consumers         Con successful completion of this module the learner should be able to:       Consumers         Consumers       Translate written descriptions into mathematical form.         Cols       Select appropriate mathematical formulae for a given problem.         Cold       Perform experiments on mechanical engineering science topics and interpret the results.         Cols       Module Recommendations         Tris is prior learning (or a practical skill) that is recommended before enrolment in this module.         No recommendations listed       Concerquisite modules listed         Consumeration modules listed       Consumeration of this module.         No incompatible modules li	Chiversity						
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Module Delivered In       No Programmes         Teaching & Learning       Lectures, tutorials along with self-directed study and practical exercises.         Strategies:       To provide the student with an understanding of the underlying scientific principles of Mechanical Engineering         Module Aim:       To provide the student with an understanding of the underlying scientific principles of Mechanical         Module Aim:       To provide the student with an understanding of the underlying scientific principles of Mechanical         Module Aim:       To provide the student with an understanding of the underlying scientific principles of Mechanical         Module Aim:       To provide the student with an understanding of the underlying scientific principles of Mechanical         Module Aim:       To provide the student with an understanding of the underlying scientific principles of Mechanical         Interpret written descriptions of practical engineering problems.       Interpret written descriptions of practical engineering problems.         LO3       Select appropriate mathematical formulae for a given problem.       Interpret the results.         LO4       Perform experiments on mechanical engineering science topics and interpret the results.       Interpret written descriptions using spreadsheets         Pre-requisite learning       Module Recommendations       This is prior learning outcomes that are too similar to the learning outcomes of this module.         No incompatible Modules       Interpret written delearning out	Credits:	Credits: 10					
Teaching & Learning       Lectures, tutorials along with self-directed study and practical exercises.         Module Aim:       To provide the student with an understanding of the underlying scientific principles of Mechanical Engineering         Learning Outcomes       Engineering         On successful completion of this module the learner should be able to:       Engineering         L01       Interpret written descriptions of practical engineering problems.         L02       Translate written descriptions into mathematical form.         L03       Select appropriate mathematical formulae for a given problem.         L04       Perform experiments on mechanical engineering science topics and interpret the results.         L05       Model, report & solve mathematical problems using spreadsheets         Pre-requisite learning       Module Recommendations         This is prior learning (or a practical skill) that is recommended before enrolment in this module.         No recommendations listed       Incompatible Modules         Incompatible Modules       Istee         Requirements       Co-requisite modules listed         Requirements       To corequisite modules listed         Requirements       This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.	NFQ Level:	6					
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Learning Outcomes         On successful completion of this module the learner should be able to:         L01       Interpret written descriptions of practical engineering problems.         L02       Translate written descriptions into mathematical form.         L03       Select appropriate mathematical formulae for a given problem.         L04       Perform experiments on mechanical engineering science topics and interpret the results.         L05       Model, report & solve mathematical problems using spreadsheets         Pre-requisite learning         Module Recommendations         This is prior learning outcomes that are too similar to the learning outcomes of this module.         No recompatible Modules         These are modules listed         Requisite Modules         No Co-requisite modules listed         Requisite modules listed         Requirements         No learning (or a practical skill) that is mandatory before enrolment in this module is allowed.	Teaching & Strategies:	Learning	Lectures, tutorials along with self-directed study and practical exercises.				
On successful completion of this module the learner should be able to:         LO1       Interpret written descriptions of practical engineering problems.         LO2       Translate written descriptions into mathematical form.         LO3       Select appropriate mathematical formulae for a given problem.         LO4       Perform experiments on mechanical engineering science topics and interpret the results.         LO5       Model, report & solve mathematical problems using spreadsheets    Pre-requisite learning Module Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module. No recommendations listed Incompatible Modules These are modules which have learning outcomes that are too similar to the learning outcomes of this module. No incompatible modules listed Co-requisite modules listed Requirements This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.	Module Aim	:					
LO1       Interpret written descriptions of practical engineering problems.         LO2       Translate written descriptions into mathematical form.         LO3       Select appropriate mathematical formulae for a given problem.         LO4       Perform experiments on mechanical engineering science topics and interpret the results.         LO5       Model, report & solve mathematical problems using spreadsheets <b>Pre-requisite learning Module Recommendations</b> This is prior learning (or a practical skill) that is recommended before enrolment in this module.         No recommendations         These are modules which have learning outcomes that are too similar to the learning outcomes of this module.         No incompatible Modules         These are modules listed <b>Co-requisite Modules</b> No Co-requisite modules listed <b>Requirements</b> No Co-requisite modules listed <b>Requirements</b> The is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.	Learning Ou	itcomes					
LO2       Translate written descriptions into mathematical form.         LO3       Select appropriate mathematical formulae for a given problem.         LO4       Perform experiments on mechanical engineering science topics and interpret the results.         LO5       Model, report & solve mathematical problems using spreadsheets         Pre-requisite learning       Model, report & solve mathematical problems using spreadsheets         Pre-requisite learning       Model, or a practical skill) that is recommended before enrolment in this module.         No recommendations listed       Incompatible Modules         These are modules which have learning outcomes that are too similar to the learning outcomes of this module.         No incompatible modules listed         No Co-requisite modules listed         No Co-requisite modules listed         Requirements         The prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.	On successfu	ul completion of th	his module the learner should be able to:				
LO3       Select appropriate mathematical formulae for a given problem.         LO4       Perform experiments on mechanical engineering science topics and interpret the results.         LO5       Model, report & solve mathematical problems using spreadsheets         Pre-requisite learning         Module Recommendations         This is prior learning (or a practical skill) that is recommended before enrolment in this module.         No recommendations listed       Incompatible Modules         These are modules which have learning outcomes that are too similar to the learning outcomes of this module.         No incompatible modules listed       Co-requisite modules listed         Requirements         No Co-requisite modules listed         Requirements         This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.	LO1	Interpret written	descriptions of practical engineering problems.				
LO4       Perform experiments on mechanical engineering science topics and interpret the results.         LO5       Model, report & solve mathematical problems using spreadsheets         Pre-requisite learning         Module Recommendations         This is prior learning (or a practical skill) that is recommended before enrolment in this module.         No recommendations listed         Incompatible Modules         These are modules which have learning outcomes that are too similar to the learning outcomes of this module.         No incompatible modules listed         Co-requisite Modules         No Co-requisite modules listed         Requirements         This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.	LO2	Translate written descriptions into mathematical form.					
LO5       Model, report & solve mathematical problems using spreadsheets         Pre-requisite learning         Module Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module.         No recommendations listed         Incompatible Modules These are modules which have learning outcomes that are too similar to the learning outcomes of this module.         No incompatible modules listed         Co-requisite Modules         No Co-requisite modules listed         Requirements This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.	LO3	Select appropriate mathematical formulae for a given problem.					
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	No requirements listed						



## MECH H1607: Mechanics of Machines 1

### Module Content & Assessment

Indicative Content	
Theory - Units • Mass, length, time, density, relative density, force, weight and the International system of units	
Theory - Motion • Acceleration, speed, velocity, displacement, motion. • Newton's laws of motion. • Equations of motion. • Spe	eed-time graphs
Theory - Moments • Principle of moments. • Centre of gravity. • Moment of a force - couple	
Theory - Forces • Triangle of forces. • Polygon of forces. • Parallelogram of forces. • Resultant of a system of forces • Resolut	tion of forces.
Theory - Friction • Laws of friction. • Limiting friction. • Friction on horizontal and inclined planes. • Angle of friction and the total	al reaction
Theory - Work and Power • Work done by a force. • Power. • Work done by torque. • Tractive effort.	
Theory - Momentum • Elastic collisions. • Conservation of Momentum. • Kinetic Energy. • Potential Energy. • Conservation of Ene	rgy
Theory - Machines • Law of a machine. • Mechanical advantage. • Velocity ratio. • Efficiency and limiting efficiency. • Application	s to simple machines
Theory - Stress and Strain • Direct stress and strain. • Hooke's law. • Modulus of elasticity	
Theory - Circular motion • Angular velocity and acceleration. • Centripetal force. • Centrifugal force	
Theory - Shear Force and Bending Moments •Define shear forces and bending moments •Define uniformly distributed loads (UDL) •Calculate shear force •Plot shear force and bending moment diagrams	and bending moment values
Practical Lab Experiments Carry out a series of mechanical engineering lab experiments and produce relevant lab reports. Experiments Forces • Polygon of Forces • Principle of Moments • Centre of Gravity • Simple Machines • Stress and Strain Pendulum • Motion on an inclined plane (Energy Method) • Coefficient of friction (Horizontal Plane) • Coeffici Pulley drives • Simple and Compound Gear Trains. • Modulus of Rigidity • Young's Modulus	Hooke's Law      Simple
Computer Applications • Develop spreadsheets:- • To perform calculations • To produce charts to represent data • For incorporation	into laboratory reports
Assessment Breakdown	%
Continuous Assessment	15.00%
Practical	15.00%
End of Module Formal Examination	70.00%
Continuous Assessment	

Continuous Assessment					
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date	
Other	Each student will be obliged to complete a continuous assessment programme for which 15% will be awarded. This will involve in-class tests and other assigned tasks.	1,2,3,5	15.00	n/a	

No Project

Practical						
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date		
Practical/Skills Evaluation	Complete lab based experiments and write up relevant technical reports.	1,3,4	15.00	Every Second Week		

End of Module F	End of Module Formal Examination					
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date		
Formal Exam	A final written examination will assess the student's attainment of the module learning outcomes	1,2,3,5	70.00	End-of- Semester		

Continuous As	ssessment				
Assessment Type	Assessme	Assessment Description		% of total	Assessment Date
Other	- Two written block assessments Short multiple choice written assessments.			15.00	n/a
No Project					
Practical					
Assessment Type		Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation		Complete experiments and write up relevant reports.		15.00	n/a
End of Module	Eormal Evan	nination			
	1				
Assessment Type	Assessmer	nt Description	Outcome addressed	% of total	Assessment Date

 
 Type
 addressed
 total
 Date

 Formal Exam
 A final written examination will assess the student's attainment of the learning outcomes of the module.
 70.00
 End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment



#### MECH H1607: Mechanics of Machines 1

### Module Workload

Workload: Full Time		
Workload Type	Frequency	Average Weekly Learner Workload
Lecture	Every Week	3.00
Laboratory	Every Week	1.50
Tutorial	Every Week	0.50
Independent Learning	Every Week	2.00
	Total Hours	7.00