



<b>Module Title</b> <b>Dynamics</b>	<b>Module Code</b> <b>MSDE 310</b>	<b>Semester</b> <b>(Sem 2)</b>
<b>Credits</b> <b>10</b>	<b>Level</b> <b>5</b>	<b>Professor and email</b> <b>Anthony Johnson</b> <b>a.d.johnson@seoultech.ac.kr</b>
<b>Delivery Method</b> <b>Lecture / Lab / Project</b> <b>Lecture</b>	<b>Delivery Location</b> <b>Mugung Hall</b> <b>Seoultech</b>	
<p><b>Module Synopsis</b>  This module provides the theory and applications of engineering dynamics, divided into kinematics and kinetics.  Force, velocity and acceleration of a particle and rigid body are considered.  Moments of inertia, momentum, friction and ratioing systems are also considered  Work and energy, impulse and momentum are also analyzed.  Dynamic theory is applied to real engineering problems.  Assessment is made through a mid-semester test and a final exam which accounts for the majority of the module mark</p>		
<p><b>Outline Syllabus</b></p> <p><b>Kinematics of particles</b>  Study of the geometry of motion. Kinematics is used to relate displacement, velocity, acceleration, and time without reference to the cause of motion for a particle. Rectilinear motion and Curvilinear motion.</p> <p><b>Kinetics of a particle</b>  Study of the relations existing between the forces acting on a body, the mass of the body, and the body. Force and acceleration, Work and energy, and Impulse and momentum</p> <p><b>Kinematics of rigid bodies</b>  Relations between time and positions, velocities, and accelerations of the particles forming a rigid body. Translation, Rotation about a fixed axis, and General motion.</p> <p><b>Kinetics of a rigid body</b>  Relations between the forces acting on a rigid body, the shape and mass of the body, and the motion produced. Forces and accelerations, Work and energy, Impulse and momentum.</p> <p><b>Applications</b>  Ratioing elements and gear ratios, friction on an inclined plane, screw threads power transmission</p>		
<p><b>Indicative Reading</b>  Vector Mechanics for Engineers : Dynamics, 9<sup>th</sup> Edition, F. P. Beer, E. R. Johnston, Jr., W. E. Clausen, McGraw Hill, 2010. ISBN 978 007 131108 3</p> <p>Foundations of Mechanical Engineering Johnson and Sherwin: Reprinted 2014: Taylor and Francis  ISBN-10: 0748764232: ISBN-13: 978-0748764235</p>		



## MSDE Module Descriptor

Assessments	Assessment Type	Weighting %	Mid-Term/interim/final
Coursework			
Project			
Quiz			
Test	Mid Sessional	30%	Mid Sessional
Laboratory			
Exam	Final	70%	Final
Presentation			
<b>NOTIONAL STUDENT WORKLOAD (Hours)</b>		Hours	
MODE OF DELIVERY (FT / PT / DL)		FT	
Lectures		50	
Seminars			
Tutorials		10	
Laboratories/studios/practical			
Directed learning			
Independent Learning		40	
Work experience/fieldwork			
Other: eg formal presentation			
Total Workload 100 hours for a 10 credit module 200 hours for a 20 credit module		100	

Module Learning Outcomes	
KU 1,2,3	Apply advanced knowledge of the scientific and mathematical foundations of engineering to solve problems. Perform comprehensive analysis of engineering systems. Identify and utilise advanced methodologies to create solutions to a variety of engineering problems.
IPSA 1,4	Apply a range of appropriate approaches to solving defined real world engineering problems. Illustrate a range of solutions to advanced engineering problems.
PVA 2	Apply creativity in the development of solutions to standard engineering problems