



Module Title Engineering Mathematics II	Module Code MSDE 214	Semester (Sem 1 / Sem 2) Sem 2
Credits 10	Level 4	Professor and email Hyo-Sok Ahn hsahn@seoultech.ac.kr
Delivery Method Lecture	Delivery Location SeoulTech, Mugung Hall	
Module Synopsis This module aims to provide students with the ability to manipulate matrices and vectors and apply them to geometrical and physical problems. Topics included are vectors and matrices, vector analysis, eigenvalue problems and most importantly vector calculus. The student will acquire the fundamental knowledge of using linear algebra and vector calculus. Assessment is made through four quizzes and a final exam at the end of the course.		
Outline Syllabus Vector algebra Concepts. Scalar and vector products. Application to simple geometrical and physical problems (statics and dynamics). Matrices Multiplication, transpose, inverse, and determinants. Cramer's rule. System of linear equations. Eigenvalue problems. Orthogonalization. Vector calculus Vector function and derivatives of vector function. Geometry of space curve. Vector fields. Gradient. Line integral, double integral, and triple integral. Green's theorem, Gauss theorem and divergence theorem.		
Indicative Reading 1) Advanced Engineering Mathematics, 4th Ed., D.G. Zill, W.S. Wright, and M.R. Cullen, Jones and Bartlett Publishers, 2010 2) Advanced Engineering Mathematics, 10th Ed., E. Kreyszig, Jone Wiley & Sons, 2015		



NOTIONAL STUDENT WORKLOAD	Hours
MODE OF DELIVERY (FT / PT / DL)	FT
Lectures	60
Seminars	
Tutorials	10
Laboratories/studios/practical	
Directed learning	20
Independent Learning	10
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	
KU1,2,3	KU1. Demonstrate basic knowledge of the scientific and mathematical foundations of engineering to solve basic problems. KU2. Perform simple analysis of familiar engineering systems. KU3. Identify and utilise basic methodologies to create solutions to specific engineering problems.
IPSA1,4	IPSA1. Demonstrate the use of fundamental approaches to solving readily defined engineering problems. IPSA4. Illustrate solutions to basic engineering problems.
PVA2	PAV2. Demonstrate creativity in discussing solutions to standard problems.



Seoul National University of
Science & Technology
232 Gongneung-ro, Nowon-gu,
Seoul 01811 Korea

MSDE Module Descriptor

Assessments	Assessment Type	Weighting %	Mid-Term/interim/final
Coursework			
Project			
Quiz	4 quizzes, 40 min	40	Interim
Test			
Laboratory			
Exam	2 hrs exam	60	Final
Presentation			