Syllabus [2025Year 1 Term]

Course Information

Course Title	General Mathematics 1	Credits	3
Course Code	559360-1	Required/Elective (For Undergraduate Courses)	basic Major
Department or Major	Department of Bio and Material Engineering	Language	English
Methods of Teaching		Lecture Room	목9,10,11,12,13,14(국제503)
Time Allotment	Lecture(3) Experiments(0) Trainging & Practice(0) Performance(0) Designing & Planning(0)	Cyber Lectures	
Course Type	offline		

Lecturer

Lecturer	Name	HUANG ZHENGMIN	Rank	Invited Professor	Final Academic Degree	박사
	Department & college	Department of Bio and Material Engineering		Office	Seok Juseon Memorial Museum 226	
	Office Phone Number	—		e-mail	jungmin@dankook.ac.kr	
	Field of Interest					

Course Summary

Course Description	This course is the first one of the two consecutive General Mathematics courses. As a fundamental study for science and engineering students, understanding differentiation and integration is the main interest of this course. Especially, one variable functions are main topic of this course. Also we study problem solving techniques related to differentiation and integration. We review some high school level mathematics during the course.
Description Related Courses	This course is related to various courses such as: General Mathematics 2, Engineering Mathematics, Probability and Statistics.
Course Goals	- Students can understand the basic concept of calculus. - Students can understand functions and models. - Students can understand differentiation and integrals with single variable. - Students can understand applications of differentiation and integration. - Students can understand differentiation and integrals with multiple variables.

Projected Results	- Ability to apply knowledge of mathematics, basic science, engineering, and information technology to solve engineering problems. - Ability to define and formalize engineering problems. - Ability to utilize up-to-date information, research results, and appropriate tools to solve engineering problems.
Percentage of the original language classes(%)	

Syllabus

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
1	Introduction		강의,	
2	Functions and Models	- Four Ways to Represent a Function - Mathematical Models: A Catalog of Essential Functions - New Functions from Old Functions	강의,	
3	Differentiation Rules	- Derivatives of Polynomials and Exponential Functions - The Product and Quotient Rules - Derivatives of Trigonometric Functions - The Chain Rule	강의,	
4	Differentiation Rules Integrals	- Implicit Differentiation - Inverse Trigonometric Functions and their Derivatives	강의,	
5	Integrals	- Derivatives of Logarithmic Functions - Areas and Distances - The Definite Integral	강의,	
6	Integrals	- Evaluating Definite Integrals - The Fundamental Theorem of Calculus. - The Substitution Rule	강의,	
7	Integrals	- Integration by Parts - Additional Techniques of Integration	강의,	
8	Mid-term Exam			

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
9	Application of Integration	- More about Areas - Volumes - Volumes by Cylindrical Shells	강의,	
10	Application of Integration	- Arc Length - Average Value of a Function	강의,	
11	Partial Derivatives	- Functions of Several Variables - Limits and Continuity - Partial Derivatives	강의,	
12	Partial Derivatives	- Partial Derivatives	강의,	
13	Multiple Integrals	- Double Integrals over Rectangles	강의,	
14	Multiple Integrals	- Iterated Integrals - Double Integrals over General Regions - Applications of Double Integrals	강의,	
15	Final Exam			

Methods of Grading

sequence	Description	Percentage	Details
1	Mid-tem Exam	40%	
2	Final-exam	40%	
3	Pop Quizzes	0%	
4	Assignments	10%	
5	Reports	0%	
6	Presentations & Discussions	0%	
7	Attendance	10%	
8		0%	
9	Others	0%	
All		100%	

Core of Value

핵심가치	전공역량	역량정의	역량구분	값(%)
혁신 (Discovery)	창의적문제해결 (Creative problem-solving)	주어진 상황과 문제를 창의적으로 해결할 수 있는 능력		0%

핵심가치	전공역량	역량정의	역량구분	값(%)
혁신 (Discovery)	도전 (Challenging)	전공 지식을 새로운 분야와 융합하고 아우를 수 있는 능력		0%
혁신 (Discovery)	지식융합 (Knowledge convergence)	새로운 분야를 개척하거나 도전적으로 임할 수 있는 능력		0%
헌신 (Dedication)	세계시민 (Universal value)	세계 공동체 구성원으로 전공자로서 국제적 이슈에 대응할 수 있는 능력		0%
헌신 (Dedication)	상호협력 (Cooperation)	공동의 목적 달성을 위해 타인과 상호협력을 할 수 있는 능력		0%
헌신 (Dedication)	공동체 (Sense of community)	공동체의 구성원으로서 필요한 태도와 윤리의식을 가질 수 있는 능력		0%
능동 (self- Determination)	자기주도 (Self-Managing)	주어진 상황과 문제를 주도적이고 능동적으로 해결할 수 있는 능력	주역량	0%
능동 (self- Determination)	지식활용 (Knowledge application)	주어진 상황과 문제에 대해 논리적으로 파악하고 분석할 수 있는 능력		0%
능동 (self- Determination)	논리적사고 (Logical thinking)	전공관련 지식을 필요에 따라 다양하게 적용하고 활용할 수 있는 능력	부역량	0%
능동 (self- Determination)	의사소통 (Articulation)	대화를 통해 다양한 의견을 조율하고 합의를 이끌어 낼 수 있는 능력	부역량	0%

Textbook(s) & References

Description	Title	Author	Publisher
Required Textbook	Calculus 4e: Concepts and Contexts (International Edition)	James Stewart	Cengage Learning

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