



# Syllabus (2022-Summer)

Course Title	Engineer Mathematics	Course No.	
Department/ Major	Dept. of Electronic and Electrical Engineering	Credit/Hours	3/3
Class Time/ Classroom			
Instructor	Name: Jeehyeon Seo	Dept. of Electronic and Electrical Engineering	
	E-mail: meshgrid80@gmail.com	Telephone: 010-6741-1729	
Office Hours/ Office Location	TBA / appointment via email		

## I. Course Overview

### 1. Course Description

The course is aimed at developing the basic Mathematical skills for Engineering students that are imperative for effective understanding of Engineering subjects. The topics introduced will serve as basic tools for specialized studies in many Engineering fields. There are four main sections: Ordinary Differential Equations(first-order ODEs,second-order linear ODEs, higher order ODEs, series solution of ODEs); and Vector Calculus (differentiation and integration of vectors).

Students should understand and be able to use the language and methods of mathematics in the description, analysis and design of engineering systems.

### 2. Prerequisites

Calculus is required.

### 3. Course Format

Lecture	Discussion/Presentation	Experiment/Practicum	Field Study	Other
100 %	0 %	0 %	0 %	0 %

(Instructor can change to match the actual format of the class.)



#### 4. Course Objectives

The objective of this course is to understand the basic principles of solving ordinary differential equations and to learn how to calculate line integral and surface integral over the vector field. The class comprises a lecture and quizzes per week.

#### 5. Evaluation System

Midterm Exam	Final Exam	Quizzes	Presentation	Projects	Assignments	Participation	Attendance
40 %	40 %	10%	%	%	%	%	10 %

\* Explanation of evaluation system:

- Grade will be determined based on combined evaluation (absolute and relative evaluation)
- According to the university evaluation rule for classes in English, the maximum portion of A and A+B will be 45% and 90%, respectively. .
- 3 late attendances are equal to 1 absence.
- More than 10 absences will give F grade.
- **Failure to take either the midterm or the final exam will cause F grade.**

### II. Course Materials and Additional Readings

#### 1. Required Materials

Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, Inc., 2011.

#### 2. Supplementary Materials

None

#### 3. Optional Additional Readings

### III. Course Policies

- \* For laboratory courses, all students are required to complete lab safety training.
  - The course will be offered in English.
  - Failure to take either the midterm or the final exam will cause F grade.



## IV. Course Schedule (15 credit hours must be completed.)

Week	Date	Topics & Class Materials, Assignments
Week 1		Chapter1. Introduction to engineering mathematics
		First order ode-separable and exact ode
Week 2		nonexact ode
		Linear ode
Week 3		Chapter2 Second order ode: basic concepts , homogeneous ode with constant coefficients
		Modeling of free oscillations of a mass spring system
Week 4		Euler caucuy equations
		Existence and uniqueness of solutions
Week 5		Wronskian
		nonhomogeneous odes
Week 6		solutions by variation of parameters
		Chapter3. Higher oder ode: Homogeneous linear ode with constatn coefficients
Week 7		Nonhomogeneous linear ode
		Chapter5 Series solutions of ode : Review of power, Power series solutions
Week 8		Frobenious solutions
		Midterm exam
Week 9		Midterm exam
		Chapter9 Review of calculus, basic concepts of integral
Week 10		one variable calculus
		Chapter9 vector calculus, vectors in 2d and 3d, inner product and cross product
Week 11		Vector and scalar functions and their derivatives
		Gradient, curls and curves
Week 12		Area and volume: multiple integrals, coordinates systems, Line integrals
		Line integral
Week 13		Surface integral
		Chapter 10 Green theorem
Week 14		Stokes theorem
		Divergence theorem
Week 15		Review of Green, Stokes, Divergence theorems.
		Final exam
Makeup Class		Final exam



### V. Special Accommodations

\* According to the University regulation section #57-3, students with disabilities can request for special accommodations related to attendance, lectures, assignments, or tests by contacting the course professor at the beginning of semester. Based on the nature of the students' request, students can receive support for such accommodations from the course professor or from the Support Center for Students with Disabilities (SCSD). Please refer to the below examples of the types of support available in the lectures, assignments, and evaluations.

Lecture	Assignments	Evaluation
<ul style="list-style-type: none"> <li>· Visual impairment : braille, enlarged reading materials</li> <li>· Hearing impairment : note-taking assistant</li> <li>· Physical impairment : access to classroom, note-taking assistant</li> </ul>	<ul style="list-style-type: none"> <li>Extra days for submission, alternative assignments</li> </ul>	<ul style="list-style-type: none"> <li>· Visual impairment : braille examination paper, examination with voice support, longer examination hours, note-taking assistant</li> <li>· Hearing impairment : written examination instead of oral</li> <li>· Physical impairment : longer examination hours, note-taking assistant</li> </ul>

- Actual support may vary depending on the course.

\* The contents of this syllabus are not final—they may be updated.