이화여자대학교
EWHA WOMANS UNIVERSITY

Syllabus (2021-Fall)

Course Title	Numerical Analysis for Electronics Engineering	Course No.	34309
Department/ Major	Electronic and Electrical Engineering	Credit/Hours	3.0/3.0
Class Time/ Classroom	Monday (11:00 – 12:15) Wednesday (09:30 – 10:45)		
Instructor	Name: Park, Suhyun	Department: Electronic and Electrical Engineering	
	E-mail: suhyun.park@ewha.ac.kr	Phone: 02-3277-6548	
Office Hours/ Office Location			

Ⅰ. Course Overview

1. Course Description

This course is designed to teach students numerical analysis technologies that can be applied for solving engineering problems. Major topics include solving equations, interpolation, least squares fitting, numerical optimization, etc. Stochastic gradient based training method for machine learning will also be discussed.

2. Prerequisites

N.A.

3. Course Format

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

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

Lecture from Cyber Campus

4. Course Objectives

To learn numerical analysis technologies that can be applied for solving engineering problems and practice Matlab coding.

5. Evaluation System

☐ Relative evaluation ☐ Absolute evaluation ☐ Others :

– Explanation of evaluation system:

compromise between absolute and relative evaluation

Midterm Exam	Final Exam	Quizzes	Presentation	Projects	Assignments	Participation	Attendance
35 %	35 %	%	%	%	20 %	%	10 %

* Evaluation of group projects may include peer evaluations.

II. Course Materials and Additional Readings

1. Required Materials

Numerical Methods for Engineers (8th Edition) by S. C. Chapra and R. P. Canale

2. Supplementary Materials

An Introduction to Numerical Methods A MATLAB Approach (4th edition) by A. Kharab and R. B. Guenther

3. Optional Additional Readings

III. Course Policies

* For laboratory courses, all students are required to complete lab safety training.

- Lecture notes and announcements are available from Cyber Campus
- Missing either midterm or final exam -> Fail (grade F)
- Absent for more than 1/3 of classes -> Fail (grade F)
- Online attendance is automatically checked by online class participation.
- Late homework submission is not accepted.

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

Week	Date	Topics & Class Materials, Assignments
Week 1		Course Introduction Modeling, Computers, and Error Analysis – Mathematical Modeling, Matlab
Week 2		Modeling, Computers, and Error Analysis – Programming, Matlab
		Modeling, Computers, and Error Analysis – Approximations and Round-Off Errors
Week 3		Modeling, Computers, and Error Analysis – Truncation Errors
		Roots of Equations – Bracket Methods
Week 4		Roots of Equations – Bracket Methods
		Roots of Equations – Open Methods
Week 5		Linear Algebraic Equations – Gauss Elimination
		Linear Algebraic Equations – Gauss Elimination
Week 6		Linear Algebraic Equations – LU Decomposition
		Linear Algebraic Equations – LU Decomposition
Week 7		Curve-Fitting – Least-Squares Regression
		Curve-Fitting – Least-Squares Regression
Week 8		
		Midterm
Week 9		Curve-Fitting – Least-Squares Regression
		Curve-Fitting – Interpolation
Week 10		Curve-Fitting – Interpolation
		Curve-Fitting – Interpolation

Week	Date	Topics & Class Materials, Assignments
Week 11		Curve-Fitting – Interpolation
		Optimization – One-dimensional Unconstrained Optimization
Week 12		Optimization – One-dimensional Unconstrained Optimization
		Optimization – Multi-dimensional Unconstrained Optimization
Week 13		Optimization – Multi-dimensional Unconstrained Optimization
		Optimization – Multi-dimensional Unconstrained Optimization
Week 14		Applications for Numerical Analysis
		Applications for Numerical Analysis
Week 15		Applications for Numerical Analysis
		Final Exam
Makeup Class	(mm/dd)	
Makeup Class	(mm/dd)	

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
. Visual impairment : braille, enlarged reading materials . Hearing impairment : note-taking assistant . Physical impairment : access to classroom, note-taking assistant	Extra days for submission, alternative assignments	. Visual impairment : braille examination paper, examination with voice support, longer examination hours, note-taking assistant . Hearing impairment : written examination instead of oral . Physical impairment : longer examination hours, note-taking assistant

- Actual support may vary depending on the course.

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