

# 강의계획서

Credits	Department	Representative Instructor
3	Department of Mechanical Engineering	Choi, Haecheon(Professor) choi@snu.ac.kr

## Download

Attachment(Korean)	
Attachment(English)	

## Course Syllabus

1. Goals	This course is to introduce students numerical methods that solve various steady/unsteady ordinary and partial differential equations.					
2. Texts and References	Materials-Books-Fundamentals of Engineering Numerical Analysis-Parviz Moin-Cambridge University Press-2010-ISSN/DOI/ISBN://0521711231-					
3. Evaluation	Grading method	Absolute evaluation	Rating status	A~F		
	Attendance(%)	10%				
	Task(%)	40%				
	Medium(%)	25%				
	Final(%)	25%				
	Random Evaluation(%)	0%				
	Attitude(%)	0%				
	Etc(%)	0%				
	Total(%)	100%				
	Attendance Policy	Students who are absent for over 1/3 of the class will receive a grade of 'F' or 'U' for the course. (Exceptions can be made when the cause of absence is deemed unavoidable by the course instructor.)				
Other						
4. Quota Exceeding Course Registration	Acceptable student	Maxium				
5. Guideline for Students	There will be four programming homeworks during this course. The homework load will be increasing significantly as time goes by.					
	Interview Time/Place	MW 5 - 6 pm / 301-1511				
6. Lecture Plan	Lecture method	<input type="checkbox"/> Flip learning	<input type="checkbox"/> Theory-driven learning	<input type="checkbox"/> Discussion-oriented learning	<input type="checkbox"/> Project-based learning	<input type="checkbox"/> Etc
		Other Contents				
<p>[ 1 Week ]            Chapter 0. Linear Algebra            Operation counts, Banded matrices and Gauss elimination, LU decomposition, Roundoff error, Ill-conditioned matrices, Stiffness, Cayle-Hamilton theorem</p> <p>[ 2 Week ]            Chapter 0. Linear Algebra            Operation counts, Banded matrices and Gauss elimination, LU decomposition, Roundoff error, Ill-conditioned</p>						

matrices, Stiffness, Cayle-Hamilton theorem  
 [ 3 Week ]  
 Chapter 1. Interpolation  
 Lagrange interpolation, Spline interpolation  
 [ 4 Week ]  
 Chapter 2. Numerical Differentiation - Finite Differences  
 Taylor table, Modified wavenumber, Pad approximation  
 [ 5 Week ]  
 Chapter 3. Numerical Integration  
 Trapezoidal rule, Simpson's rule, Error analysis, Romberg integration, Richardson extrapolation, Adaptive quadrature, Gauss quadrature  
 [ 6 Week ]  
 Chapter 3. Numerical Integration  
 Trapezoidal rule, Simpson's rule, Error analysis, Romberg integration, Richardson extrapolation, Adaptive quadrature, Gauss quadrature  
 [ 7 Week ]  
 Chapter 4. Numerical Solution of Ordinary Differential Equations  
 Initial value problems, Accuracy, Stability, Implicit methods, Linearization, Runge-Kutta methods, Multi-step methods, Boundary value problems  
 [ 8 Week ]  
 Chapter 4. Numerical Solution of Ordinary Differential Equations  
 Initial value problems, Accuracy, Stability, Implicit methods, Linearization, Runge-Kutta methods, Multi-step methods, Boundary value problems  
 [ 9 Week ]  
 Chapter 4. Numerical Solution of Ordinary Differential Equations  
 Initial value problems, Accuracy, Stability, Implicit methods, Linearization, Runge-Kutta methods, Multi-step methods, Boundary value problems  
 [ 10 Week ]  
 Chapter 4. Numerical Solution of Ordinary Differential Equations  
 Initial value problems, Accuracy, Stability, Implicit methods, Linearization, Runge-Kutta methods, Multi-step methods, Boundary value problems  
 [ 11 Week ]  
 Chapter 5. Numerical Solution of Partial Differential Equations  
 von Neumann stability analysis, Modified wavenumber analysis, Approximate factorization, Alternating direction implicit methods, Iterative methods for elliptic PDEs  
 [ 12 Week ]  
 Chapter 5. Numerical Solution of Partial Differential Equations  
 von Neumann stability analysis, Modified wavenumber analysis, Approximate factorization, Alternating direction implicit methods, Iterative methods for elliptic PDEs  
 [ 13 Week ]  
 Chapter 5. Numerical Solution of Partial Differential Equations  
 von Neumann stability analysis, Modified wavenumber analysis, Approximate factorization, Alternating direction implicit methods, Iterative methods for elliptic PDEs  
 [ 14 Week ]  
 Chapter 6. Discrete Transform Methods  
 Discrete Fourier series, Aliasing error, Fourier spectral numerical differentiation, Discrete Chebyshev transform, Finite Element Method  
 [ 15 Week ]  
 Chapter 6. Discrete Transform Methods  
 Discrete Fourier series, Aliasing error, Fourier spectral numerical differentiation, Discrete Chebyshev transform, Finite Element Method

<b>7. Support Services for Students with Disabilities</b>	For Lectures	<input type="checkbox"/> Visual Impairment: Make textbooks(digital textbook, braille textbook, enlarged textbook etc.), Allow note takers <input type="checkbox"/> Physical Disability: Make textbooks (digital textbook), Allow note takers and assistants <input type="checkbox"/> Hearing Impairment: Allow note takers and translators, Allow lecture recording <input type="checkbox"/> Health Impairment: Excuse absence due to health problems, Allow note takers <input type="checkbox"/> Learning Disability: Allow note takers <input type="checkbox"/> Intellectual Disability / Autism Spectrum Disorder: Allow note takers and mentors
	For Assignments & Evaluations	<input type="checkbox"/> Visual Impairment / Physical Disability / Hearing Impairment / Health Impairment / Learning Disability: Extend assignment deadlines, Offer alternate assignment submission and response method, Extend testing period, Offer alternate testing method, Offer different testing room <input type="checkbox"/> Intellectual Disability / Autism Spectrum Disorder: Offer individualized assignments and alternative evaluations
	Remark	Students who take this course can get appropriate level of support service including the support listed above depending on the students' individual characteristics and needs through consultation with professors and the Support Center for Students with Disabilities. If you have any questions

concerning support service for students with disabilities you can contact Professor Choi, Haecheon(02-880-8361) or Support Center for Students with Disabilities (02-880-8787).

## Weekly Lecture Plan

Week	Contents
<p data-bbox="352 338 1241 371">Sorry, There is no weekly lecture plans. Ask the lecturer if you want detail information.</p>	