Syllabus of Fall Semester, 2017

Course Title	NUMERICAL ANALYSIS	Course Code	MA24414	Section	001
Department	Mathematics	Level	3	Credit - Theory - Practice	3.0 - 3.0 - 0.0
Class Hours & Classroom	Mon. 09:00(75) 607-207,Wed. 09:00(75) 607-207				
Lecturer	Kim, Hyun-Min	Office		Office Hours	Monday 10:15-11:00, Wednesday 10:15-11:00
		Telephone		E-mail	
Methodology of Instruction	Lectures and presentations				
Evaluation and Grading	Exam I: 30 % Exam II: 30 % Projecst: 30 % (for contents: 20 % + for presentations: 10 %) Attendance: 10 % * Students with disabilities can request an extension of the exam hour, and they can take exams by getting writing assistance or by using a computer.				
Prerequisites	Calculus, Linear Algebra, Differential Equations				
Course Objectives	(1) To understand and to explain how, why and when numerical approaches for solving mathematical problems can be expected and worked. (2) To provide a foundation for further study of scientific computations.				
Course Description	The course will present a thorough introduction to the fundamental techniques of numerical methods for solving mathematical problems. By applying these techniques we will tackle a variety of numerical methods to find efficient algorithms. (1) Solving to linear and nonlinear equations (2) Polynomial interpolations and spline (3) Numerical integrations and differentiations (4) Finding Eigenvalues (5) Solving for differential equations * Students with disabilities can negotiate with the Disabled Student's Academic Support Center regarding course materials and assignments.				

Relationship between Courses and Core Competencies

8 Core Competencies of PNU								

Textbooks and References

Required Textbooks	J,DouglasFairesandRichardL.Burden,수치해석제4판,교우사(권성규외8옮김),2016. J,DouglasFairesandRichardL.Burden.NumericalMethods.4hedition,Brooks/Cole,2013.
References	[1] Kendal Atkinson. Elementary Numerical Analysis. Second edition, Wiley, 1993. [2]J,DouglasFairesandRichardL.Burden.NumericalAnalysis.8thedition,Brooks/Cole, 2004 [3] Desmond J. Higham and Nicholas J. Higham. MATLAB Guide. Second edition, SIAM, 2005. [4] Nicholas J. Higham. Accuracy and Stability of Numerical Algorithms. Second edition, SIAM, 2002. [5] Jeffery J. Leader. Numerical Analysis and Scientific Computation, Addison Wesley, 2004. [6] Cleve B. Moler. Numerical Computing with MATLAB, SIAM, 2004. [7] G. W. Stewart. Afternotes on Numerical Analysis, SIAM, 1996. [8] G. W. Stewart. Afternotes goes to Graduate School, SIAM, 1998. [9] J. H. Wilkinson. The algebraic Eigenvalue problem, Clarendon Press, Oxford, 1965.

Weekly Schedule of Classes		
Week No.	Course Material	Assignments and Other Notes
Week 1	[Orientation and Education on Academic Misbehavior(e.g. Cheating, Plagiarism) and Safety Education on Experiment and Practice] Introduction to numerical analysis Floating point arithmetic Errors	
Week 2	Solving nonlinear equations Bisection and Newton methods	Exercise and projects
Week 3	olving nonlinear equations Fixed point iteration and error analysis	Exercise and projects
Week 4	Interpolation and spline	Exercise and projects
Week 5	Numerical integrations and differentiations	Exercise and projects
Week 6	Initial value problems for ordinary differential equations	Exercise and projects
Week 7	Direct methods for solving linear systems	Exercise and projects
Week 8	Exam I	
Week 9	Iterative methods for solving linear systems	Exercise and projects
Week10	Approximation Theory	Exercise and projects
Week11	Approximating eigenvalues	Exercise and projects
Week12	Numerical solutions of nonlinear systems	Exercise and projects
Week13	Boundary-value problems for ordinary differential equations	Exercise and projects
Week14	Numerical solutions partial differential equations	Exercise and projects
Week15	Exam II	
Week16		
Attachment		