Department of Basic Sciences—Philadelphia University

Course Syllabus

Course Title	Numerical Analysis
Course Code	250371
Semester	Second/2021–2022
Lecturer	Amin Witno
Office Room	403 Nursing Faculty Building
Office Hours	Sun/Tue/Thu: 11–12; Mon/Wed: 11–12
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Short Description

This module is a first course in Numerical Analysis covering topics such as finding roots of polynomials, interpolation and polynomial approximation, numerical differentiation and integration, numerical solutions of ordinary differential equations, and selected topics in numerical methods of linear algebra.

Topics by the Week

1. Review of calculus, round-off errors, computer arithmetic
2. The Bisection Method, Fixed-Point Theorem, Newton's Method
3. Error Analysis, Accelerating Convergence
4. Zeros of polynomials, Muller's Method
5. Interpolation, Lagrange Polynomials
6. Divided Difference, Hermite Interpolation
7. Numerical Differentiation
8. Richardson's Extrapolation
9. Numerical Integration
10. Composite Numerical Integration, Romberg Integration
11. Initial Value Problems
12. Euler's Method, Higher Order Taylor Method
13. Review of Linear Systems of Equations, Matrices, Derminants, Eigenvalues
14. Iterative Method for Solving Linear System
15. Approximating Eigenvalues

Recommended Textbook

Burden and Faires, Numerical Analysis, 10th edition (2016) Cengage Learning.

Supporting Material

There are no lecture notes. Future hand-outs and supporting materials will be posted online using the chosen e-learning platform.

Online Resources

The following shortcut will take you to my web homepage at the University, where you find the course syllabus, exam dates, copies of old exams, links to the above materials, and any important announcement related to the current semester.

http://phi.witno.com

Grade Distribution

Homeworks Quizzes Class participation	30%
Midterm Exam	30%
Final Exam	40%

Exam Dates

Exam dates, once determined, will be posted online at the homepage as well as at the University student-portal page.

Homework Sets

Homework problem sets with check answers can be downloaded also from the above homepage.

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