



**DAVIS UNIVERSITY**

**COURSE SYLLABUS**  
**MTH315: NUMERICAL ANALYSIS**  
**SUMMER QUARTER 2025**

**QUARTER:** SUMMER QUARTER 2025

**COURSE SYLLABUS FOR:** MTH315 NUMERICAL ANALYSIS

**CREDIT HOURS:** 5 CREDITS

**INSTRUCTOR:**

**INSTRUCTOR EMAIL:**

**INSTRUCTOR OFFICE HOURS:**

**COURSE DESCRIPTION:** Main topics include numerical differentiation and integration, approximation, statistical analysis, finite difference methods and numerical solution to ordinary and partial differential equations, methods of numerical linear algebra, and modeling of stochastic processes.

**PREREQUISITES:** Analytic Geometry And Calculus II and Linear Algebra

**TEXT:** Richard L. Burden, J. Douglas Faires, and Annette M. Burden, *Numerical Analysis*, 10th ed. Cengage Learning

**LATE WORK POLICY:** All students are expected to submit homework assignments electronically on the date specified on the syllabus. No late homework will be accepted and the student will receive a "0" (zero) for the homework assignment. Should the student refuse to complete the assigned work for the class, it could result in the student failing the class. All work assigned is expected to be completed on the date assigned. The instructor reserves the right to

alter the schedule as necessary. Please be sure to check your email/Moodle for any changes to the schedule.

**PLAGIARISM AND COPYRIGHT INFRINGEMENT POLICY:** Work that is found to be plagiarized receives a grade of zero and often causes a student to fail a class. Documentation of plagiarism is added to the student's academic file as a violation of accepted student conduct and is subject to disciplinary action. Plagiarism is the use of another person's exact words, or their ideas written in the student's words without giving the original author credit.

Plagiarism can result from any of the following:

- Quote material directly without using quotation marks.
- Paraphrase the original so that many of the phrases are the same as the original. A good rule is no more than 3 or 4 words in a row should be the same as the original.
- Copy the original sentence pattern, substitution synonyms for key words.
- Neglect to indicate the source of the original material.

#### **ASSESSMENTS:**

Content

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Homework	30%
Quizzes	20%
Exams	50%
Total	100%

**COURSE GRADE: A = 93%-100%**

**B = 85%-92%**

**C = 77%-84%**

**D = 70%-76%**

**F = below 70%**

## TENTATIVE CLASS SCHEDULE:

(Subject to change)

Week	Content Covered	Assignments & Assessment Due
<b>Week 1:</b>	Round-off error and computer arithmetic Data types Algorithms Programming languages OS and computer environment	
<b>Week 2:</b>	Solutions of equations in one variable The Bisection Method Fixed-Point Iteration Newton's method Numerical analysis of one-dimensional data sets Numerical differentiation and integration Statistical analysis Linear regression	
<b>Week 3:</b>	Numerical solutions of systems of linear equations Tri-diagonal matrices. Gaussian exclusion Steepest descent Conjugate-gradients method Eigenvalues and Eigenvectors; Jacobi rotations	Midterm Exam- Friday
<b>Week 4:</b>	One-dimensional problems Time evolution in nonlinear ODEs PDEs and multi-dimensional problems	
<b>Week 5:</b>	(Pseudo)-random numbers Stochastic algorithms Stochastic aggregation of particles Recursion and iteration – what are the difference? Revisit some of the algorithms studied previously Some cool examples of recursions	Final Exam- Friday