

## AME525 Fall 2021

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Reference Books: Matrix Analysis, R. Horn and C. Johnson

Matrix Analysis, A. Laub (shorter)

Advanced Engineering Mathematics, 8<sup>th</sup> Edition, P. O'Neil

Complex Variable and Applications, J. Brown and R. Churchill

Applied Complex Variables, J. Dettman

Grading:	Midterm:	50%
	Final:	50%

### Course Outline

**Linear Algebra:** Gauss-Jordan-Laplace reduction, LU decomposition, Determinants, Inverse Matrix, Matrix Manipulations, Special Matrices, Hermitian Matrices, Rank of a Matrix, Elementary Operations, Vector Spaces, Linear Independence, Vector Norms, Orthogonalization of Vector Sets, QR Decomposition, Linear Transformations, Linear Equations, Solvability of Linear Equations, Eigenvalue Problem, Quadratic Forms, Symmetric Matrices, Cayley-Hamilton Theorem, Singular Value Decomposition (SVD)

**Complex Analysis:** Complex Numbers, Limits, Complex Functions, Differentiation, Cauchy-Riemann Equations, Integration, Complex Series, Taylor Series, Laurent Series, Cauchy-Goursat Theorem, Cauchy Integral Formula, Residues and Their Applications, Conformal Mapping

## Course Details:

The midterm will act as the final for the linear algebra portion of the course and the final for the complex variables portion.

Topics in class may not be covered by O'Neil's book or may be handled very differently from that in the book. I want you to treat your classnotes as your primary text and the provided texts as reference books. You will be responsible for what is done in class. The underlined books are excellent reference books covering the material in-depth.

Students are encouraged to talk to one another (in fact to, *anyone*) and discuss the homework assignments. Students can post questions on the Piazza board and get input from other students, the TA, the instructor, etc., on how to answer questions. Solutions to each homework assignment will be provided.

Students found cheating on the Midterm or the Final Exam will get an F grade on the course.

Midterm Exam Date: About the 7<sup>th</sup> or 8<sup>th</sup> Week of Class

Final Exam Date: Dec. 10, 11 a.m.-1 p.m., as per USC's Final Exam Schedule.

## Statement on Academic Conduct and Support Systems

### Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violatinguniversity-standards-and-appropriate-sanctions>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/departement-public-safety/online-forms/contact-us>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

## **Support Systems**

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students.

*The Office of Disability Services and Programs* provides certification for students with disabilities and helps arrange the relevant accommodations. The web address is: [http://sait.usc.edu/academicsupport/centerprograms/dsp/home\\_index.html](http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html)