

ANALYTIC METHODS ENGINEERING
AE 5351 Fall 2009, MW 2:30PM-3:50PM, 112 NH

Instructor's Name: Prof. Cheng Luo

Office hours: MW 1:20-2:20PM and 4PM-5PM, or by appointment.

Location and contact information: 215 Woolf Hall; Tel: (817) 272-7366; Email: chengluo@uta.edu.

Teaching assistant: TBD

Course Prerequisites: Undergraduate degree in engineering, physics, or mathematics. An identical course is offered as ME 5331, which is being taught by Prof. Seiichi Nomura this semester.

Required Textbooks and Other Course Materials:

Text: *Advanced Engineering Mathematics*, M. D. Greenberg, Prentice-Hall.

Description of Course Content: Introduction to advanced analytic methods in engineering. Methods include multivariable calculus and field theory, Fourier series, Fourier and Laplace Transforms. The coverage of the corresponding materials in the textbook is:

- Scalar and Vector Field Theory
 - Chapter 13 Differential Calculus of Functions of Several Variables
 - Chapter 14 Vectors in 3-Space
 - Chapter 15 Curves, Surfaces and Volumes
 - Chapter 16 Scalar and Vector Field Theory
- Fourier Series; Fourier Transforms and Laplace Transforms
 - Chapter 17 Fourier Series
 - Chapter 5 Laplace Transform

Course website: <http://www-woolf.uta.edu/ae5351/>; Login=ae5351; Password =22methods62; All course material (syllabus, homework, solutions, announcements, etc.) will be posted on this web site.

Grading: Final grade based on: Homework 30%, Attendance 5%, Mid-Term 30%, and Final 35%.

Grading Scale: A =100-90%, B =89-80%, C =79-70%, D =69-60%, F =below 60%.

NOTE:

- All assignments (i.e. homeworks and examinations) must be the independent work of each student.
- Submitting homework one day late will lose 10% of the score, two days will be 20%, and so on and so forth. *Unless otherwise specified, homework is due in class one week after its assignment.*
- The instructor will check the attendance randomly for totally 5 times during this semester. Missing the attendance once will lose 1% of the final grade, twice 2%, and so on and so forth.

- Only university acceptable excuses will be accepted for giving back the points deducted due to late homework submissions and/or absence of lectures.

Drop Policy: Please refer to the University drop policy. Last day to drop courses is 10/30.

Americans with Disabilities Act:

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal opportunity legislation; reference Public Law 92-112 – The Rehabilitation Act of 1973 as amended. With the passage of federal legislation entitled *Americans with Disabilities Act (ADA)*, pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at www.uta.edu/disability. Also, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364.

Academic Integrity:

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

“Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or part to another person, taking an examination for another person any act designed to give unfair advantage to a student or the attempt to commit such acts.” (Regents’ Rules and Regulations, Series 50101, Section 2.2)

Student Support Services Available:

The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally or socially should contact the Office of Student Success Programs at (817) 272-6107 for more information and appropriate referrals.

E-Culture Policy:

The University of Texas at Arlington has adopted the University email address as an official means of communication with students. Through the use of email, UT Arlington is able to provide students with relevant and timely information, designed to facilitate student success. In particular, important information concerning registration, financial aid, payment of bills, and graduation may be sent to students through email. All students are assigned an email account and information about activating and using it is available at www.uta.ed/email. New students (first semester at UT Arlington) are able to activate their email account 24 hours after registering for courses. There is not additional charge to students for using this account, and it remains active

as long as a student is enrolled at UT Arlington. Students are responsible for checking their email regularly.

Tentative Lecture Schedule on Mondays and Fridays:

No#	Date	Course Description
1	08/24	Introduction
2	08/26	Chapter 13 Limit, Continuity and differentiability-I
3	08/31	Chapter 13 Differentiability-II
4	09/02	Chapter 13 Taylor series and Chain differentiation
	09/07	Labor day-no class
5	09/09	Chapter 13 Numerical Integration
6	09/14	Some basics on infinite series (not covered in the textbook)
7	09/16	Chapter 13 Jacobian and Implicit functions
8	09/21	Chapter 13 Lagrange multiplier: an application of implicit functions
9	09/23	Chapter 13 Leibniz rule
10	09/28	Chapter 14 Triple products
11	09/30	Chapter 15 Volumes and Chapter 16 Divergence, Gradient and Curl
12	10/05	Chapter 16 Physical interpretation of divergence and Divergence theorem
13	10/07	Chapter 16 Alternative interpretation of Divergence theorem, Line integrals, and Stokes' theorem
14	10/12	Chapter 16 Line integrals
15	10/14	Review
16	10/19	Mid-Term Exam (covering Chapters 13-16, , particularly HWs and lecture materials)
17	10/21	Chapter 17 Even and odd functions
18	10/26	Chapter 17 Termwise integration and differentiation
19	10/28	Chapter 17 Fourier integral (infinite periodicity)
20	11/02	Chapter 17 Parseval's theorem and Wiener-Khinchin's theorem-I
21	11/04	Chapter 17 Wiener-Khinchin's theorem-II
22	11/09	Chapter 17 Application to Differential Equations
23	11/10	Chapter 17 Delta functions and Heaviside step functions and Chapter 5 Laplace transforms-I
24	11/16	Chapter 5 Laplace transforms-II
25	11/18	Chapter 5 Laplace transforms-III
26	11/23	Chapter 5 Laplace transforms-IV
27	11/25	Review
28	11/30	Questions
29	12/02	Final Exam (covering Chapters 17 and 5, , particularly HWs and lecture materials)