

University Mission Statement

Lubbock Christian University is a Christ-centered, academic community of learners, transforming the hearts, minds, and hands of students for lives of purpose and service.

Course Syllabus

MAT3353.01 Introduction to Numerical Analysis

Fall 2018

T/Th 10:40-11:55, NSRC 103

Instructor Information

Contact Information: David Joyner. Office Phone: 720-7382;

email: david.joyner@LCU.edu

Office Hours: *Mon:* 8:30-9:45, Noon-1:10; *Tues:* 7:00-8:25, Noon-2:30; *Wed:* 10:00-10:30, Noon-1:10; *Thur:* 7:00-8:25, Noon - 12:30. (office hours are also on the class website)

Office Location: Natural Sciences Building, office A.

Course Description: An introduction to numerical methods and analysis involving a selection of problems from non linear equations, interpolation polynomials, numeric differentiation and integration, curve fitting, and approximation of functions.

Prerequisites: MAT 2404 - Calculus 3

Learning Outcomes The student will demonstrate the ability to think critically, solve problems and display the beauty and joy of applied mathematics. Students will demonstrate appropriate competency related to the following knowledge and skills: 1) To solve linear, non-linear and differential equations and show familiarity with the theory behind the solutions. 2) To perform both polynomial and non-polynomial curve fitting to given data. 3) To use various techniques of numeric differentiation and integration. 4) To show familiarity with error analysis of various numeric techniques. 5) To show enough expertise with technology and a programming language (perl) to demonstrate the knowledge and skills listed in parts 1-4 above.

Required Text and/or Materials

Textbooks:

1) Tea Tim Numerical Analysis, by Leon Q. Brin, 2nd edition, Creative Commons Attribution-ShareAlike 4.0 International License (free textbook, a pdf file will be provided).

2) Schaum's Outline of Theory and Problems of Numerical Analysis, 2nd edition, by Dr. Francis Scheid; McGraw-Hill; ISBN: 0-07-055221-5 (I will provide this book, you do NOT have to purchase it!)

Other materials:

Scientific Calculator: TI 82/83/84; HP G8X92AA LA Prime v2, Casio FX9860, FX115 or something similar. I recommend the TI 82/83/84 or HP Prime calculator.

Internet Access: Internet Access to the Internet is required for access to homework assignments and extra study materials.

Class website: <http://www.rejoicealways.net/>

Course Policies:

1. Few students in an advanced Mathematics course can do well without everyday attendance. Examples and questions are provided in abundance during each class meeting. If you miss a lecture, please find another student who was there and who will provide you with a copy of the examples worked on during that lecture. The LCU attendance policy as outlined in the 2018-2019 Catalog will be enforced. Any combination of excused and unexcused absences beyond 25% of the class meetings (8 class meetings for this course for this semester) will also result in a warning by email and being dropped from the course with a failing grade after the 8th absence. The numeric grade for being automatically dropped will be a grade of 50 (or less if your actual average is less than 50).

2. Excused absences may be granted for illnesses, participation in school sponsored events, family emergencies and similar situations. The instructor has the final determination as to whether an absence not described here is excused or not. If a student wishes an absence to be excused, he MUST email the instructor (david.joyner@lcu.edu) giving the reason why the absence should be excused and the date of the absence. This email provides official documentation regarding the absence. No absence will be excused without it. Whenever the student knows about an absence before it occurs, he should contact the instructor by email before the class meeting and make arrangements for make-up work. I will always try to work with the student who contacts me ahead of time regarding an absence. **If no prior arrangements are made, any assignments for the absent student will be due and graded as if the student had been in class.** Whenever the student knows about an absence before it occurs, he should contact the instructor before the class meeting and make arrangements for make-up work. I will always try to work with the student who contacts me ahead of time regarding an absence. A missed test or assignment is very serious. If a student misses a test or assignment due to an unexcused absence, a zero will be given. If you miss a test or assignment due date because of an excused absence, **it is still your responsibility to contact me by email and make arrangements to take the test or turn in the assignment before I grade them and hand them back.** After the graded work is returned, it is too late to turn it in and a zero will be given.

3. Honesty and integrity are vitally important! Every student is expected to maintain the highest standards in these areas. It is always acceptable to help another student learn how to do a task with advice and demonstrations. It is never acceptable to do work for another student, who will turn it in and receive credit for it! If anyone is caught cheating on a homework assignment or quiz, a grade of 0 will be recorded for that grade. If a student is caught cheating on a test, a grade of 0 will be entered for that test. This specific class policy will be enforced according to the 2016-2017 Student Handbook. All cases of cheating will be reported as described in the student handbook.

4. Assignments and tests must be legible. If illegible work is turned in, it will be counted incorrect.

Assignments and Grading

1. Class participation is a must! You will receive a daily grade based on your engagement in the class, your questions, and your comments.

The grade will be A+ (100), A (90), B (80), C (70), F (60), F- (0).

If you miss class for an unexcused reason, the grade is F- (0). You can bring this up by showing me that you checked the website for the assignment, asking any questions you might have, and having the assignment that was given ready at the next class.

If you are constantly messing with your phone/computer/tablet, you can expect no better grade than a C. This grade will be 10% of your course grade.

See the Geno Auriemma video: <https://www.youtube.com/watch?v=tp4mIONS51E>

2. Assignments - nearly every class. Always check the website:

<http://www.rejoicealways.net/lcu-semester/fall2018/mat3353/mat3353-01-tth.html>

These assignments will be worth one or two test grades, depending on how many tests we take. A late assignment will be accepted one class meeting late with a 20% penalty.

It will not be accepted after that and will count as a zero for that assignment.

3. Occasional tests.

4. Final exam or project. I will take the average of your homework average, your final and other test grades, double the highest score and average those. This average will count as 90% of your course grade. The other 10% will be your daily participation grade.

5. The grading scale is: A = 90 - 100, B = 80-89, C = 70-79, D = 60-69, F = below 60. A non-integer numerical grade will be rounded to the next higher integer (a 79.50 would be an 80 for a B, a 79.49 would be a 79 for a C). I know this doesn't seem quite always fair, but this comes from our traditional way of recording letter grades. There has to be a dividing point. I will under no circumstances ever "budge" a numeric grade up at one of these dividing points. Whatever you make is exactly what you will get. Example: Suppose your hw grade average is an 85, test1 is an 80, test2 is a 90, and final exam grade is 98. Suppose your attendance/participation grade is a 95. Your grade will be $(85 + 80 + 90 + 98 + 98)/5 = 89 \times 90\% + 98 \times 10\% = 91$ for the course (which would be an "A").

Instructional and Outside Work Estimate

Face to face time (3 hrs/wk x 15 wks) = 45 hrs

Chapter and Other Readings (400 pages) = 20 hrs

Exam Preparation (3 exams, 8 hrs study time) = 24 hrs

Assignments (approximately 25 assignments x 2.25 hours per assignment) = 56.25 hrs

Miscellaneous Assignments (extra practice problems, tutor meetings, etc. average of 2 hours each for 5 occurrences) = 10 hours

Total Time = 155.25 hrs

ADA Policy: Students with disabilities that require special modifications must inform the instructor no later than the second class period. Appropriate arrangements, if required, will then be made.