

- Syllabus -

PHYS3330 – Numerical Methods in Physics and Computational Techniques

1. Course Information

Course Number / Section: PHYS3330.001.16F

Course Title: Numerical Methods in Physics and Computational Techniques

Term: Fall 2016

Lecture days and times:

Tuesday 10:00am – 11:15 am - Location: PHY 1.202

Thursday 10:00am – 11:15 am - Location: Brazos Computer Lab FO 1.206C

2. Instructor Contact Information

Instructor: Dr. Fabiano Rodrigues

Phone number: (972) 883 4526

E-mail: fabiano@utdallas.edu

Instructor's office hours and location: To be determined

Teaching Assistant (TA) office hours and location: To be determined

3. Course Pre-requisites, Co-requisites, and/or Other Restrictions

- Students are expected to have a basic understanding of algorithms, and have some familiarity with a high-level programming language (say, Java, Pascal, IDL, Python, etc.).
- Prerequisites: MATH 2415 (Calculus of several variables) or MATH 2419 (Calculus) and MATH 2418 (Linear algebra).

4. Student Learning Objectives/Outcomes

Students will learn to use existing mathematical and computer tools with focus on the application to physical problems. Topics include:

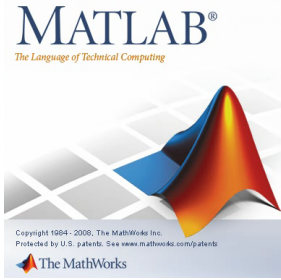
1. Introduction to Matlab
2. Solving non-linear equations
3. Solving systems of linear equations
4. Curve fitting
5. Curve interpolation
6. Spectral analyses
7. Numerical differentiation
8. Numerical integration
9. Ordinary Differential Equations: Initial-value problems
10. Ordinary Differential Equations: Boundary-value problems
11. Partial Differential Equations

5. UT Dallas Syllabus Policies and Procedures

Students are encouraged to review UT Dallas Syllabus Policies and Procedures, which are available in the following link:

<http://go.utdallas.edu/syllabus-policies>

6. Materials and Textbook



- Instead of purchasing a textbook, students are asked to purchase a copy of **MATLAB (student version)**. We will use MATLAB throughout this course. MATLAB is available, for instance, from the UT Dallas Technology store. I will provide slides covering the material of the course. **There are plenty of resources online on the topics covered by this course.**

<http://www.mathworks.com/products/matlab/>

- Students are also asked to have at least one USB drive to backup the work done in the lab. Students are responsible for maintaining copies of their work.

6. Grading Policy

Homework:	45%
Project report and presentation:	20%
Assessment(s):	20%
Attendance and lab assignments:	15%

The descriptions and timelines in this syllabus are subject to change at the instructor's discretion.