Computational Mathematics - MATH 3090

Instructor: Prof. Seyed M. Moghadas
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Note: There will be no Moodle page for this course. All information will be distributed through the website:


Class Location: R S205
Class Meetings: Mon. Wed. Fri.
Time: 11:30 – 12:30

Office Hours: 13:30 - 14:30 (Fridays)
Office Location: Ross Bldg. S619

Course Outline

• Fundamental concepts of mathematical and computational systems
• Modelling and analysis techniques
  o Differential equations and solutions
  o Numerical methods and approximations
    ▪ Standard methods: Euler, RK2, RK4, RK45
    ▪ Non-standard methods
  o Estimating errors
  o Stability analysis of numerical methods (discrete models)
• Examples of biological and physical systems
  o Logistic equation, Brusselator system, epidemic models, predator-prey systems, equilibria and limit cycles
• Data fitting and parameter estimation
• Linear and nonlinear regression
• Working with scientific package MATLAB

Evaluation Criteria

➢ Assignments: 30% (2 assignments, each worth 15%)
➢ Mid-term test: 30%
➢ Final: 40%
  o Note: topics to be covered in the test will be announced 1 week prior to the date of the test
  o Note: There will be no plussage
  o Note: If a student is not able to write the mid-term test for a documented medical reason, then the weight (30%) will be added to the final exam. Medical notes must be dated within 24 hours of the test date, and provided within 1 week of the test date. There will be no make-up test.
o **Note:** Attending Physician’s Statement must be filled: http://kopinska.apps01.yorku.ca/attend_physician_statement.pdf

### Exam Requirements

- Photo ID may be required
- Course materials are not allowed. Calculators and watches are not allowed. Detailed instructions for each test and final exam will be provided on the cover sheet of the test/exam.

### Important Dates

- Mid-term test: Friday, October 18, 2019 (Time: 11:30 - 12:30)
- Final Exam: TBD

### Important Notes

- All academic work must meet the standards contained in "Policies, Procedures, and Regulations". Students are responsible for informing themselves about those standards and understanding the consequences of academic dishonesty before performing any course-related work.
- Options for extra help: (1) Ask questions during lectures (if you do not understand the materials, ask questions before it is too late); (2) Discuss with fellow students; (3) Attend the lectures and make use of office hours.
- Electronic devices (e.g., cell/phone, CD players, computers) **MUST** be turned off during lectures. No telecommunication with outside the class is allowed while attending the lectures. **Use of such devices during lectures will result in loss of your overall marks (Each Time 10%).**
- Students with documented disabilities requiring academic accommodations for tests/exams or during lectures/laboratories are encouraged to contact the Counselling and Disability Services at 416-736-5297 to discuss appropriate options. Specific information about CDS is available on-line at http://www.yorku.ca/cds/contactus/.

### Things you should do

- Attend lectures; no lecture notes will be provided outside the class. If you miss a lecture, it is your responsibility to recover the materials from your classmates.
- Do your assignments; they will help you understand the concepts.
- When emailing, you must:
  - Use the subject “MATH3090” (**NO other subject in the email**)
  - Include your name and student number at the end of email.
  - Note: If you do not receive a response to your email, it means that:
    - You have not followed the above instructions for subject line of your email, or your email has no name and/or student number
The information you are requesting is already posted online, or will be posted in due course

- Email communication should be mainly used for making appointments

**Things you should not do**

- Email to ask technical and mathematical questions or request lecture notes
- Email to request information that is already posted on the course website
- Ask for additional marks; there is no such concept in this course.
- Ask for bell curving; there is no such concept for this course.

**Other important dates you need to find**

- Last day to enroll without permission of course instructor
- Last day to enroll with permission of course instructor
- Reading Week
- Last days to drop the course without penalty or receiving a grade