

155:307 Analysis II – Fall 2017
(Mon-Wed, 10:20-11:40am, FOA)

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Learning Assistants Two LAs are part of the course. The course will discuss and present computer implementation of the methods presented in class using Matlab (and occasionally Excel). However, this is not a programming class. The interactions with the LA will help students grasp better the theoretical concepts as well as the Matlab principles needed. The LA groups will be meeting as follows:

Monday, 6:40 pm - 8:00 pm, ARC IML 116

Friday, 1:40 pm - 3:00 pm, ARC IML 116

(9/22 and 11/3, 1:40 - 3:00 pm in Engineering C233)

Monday, 1:40 pm - 3:00 pm, ARC IML 116

Wednesday, 3:20 pm - 4:40 pm, ARC IML 121

More detailed information will be made available shortly.

Important note Exams are graded by the instructor.

Office hours: Students are **strongly** encouraged and welcome to participate with questions in class and email the instructor with their questions **at any time**. Instructor's formal office hours will be right after class until 1:30pm, unless otherwise noted on specific days.

Description: The course provides an introduction to numerical methods for the solution of a variety of chemical engineering problems. The emphasis is on both the formulation/solution of the problem as well as the analysis of the results.

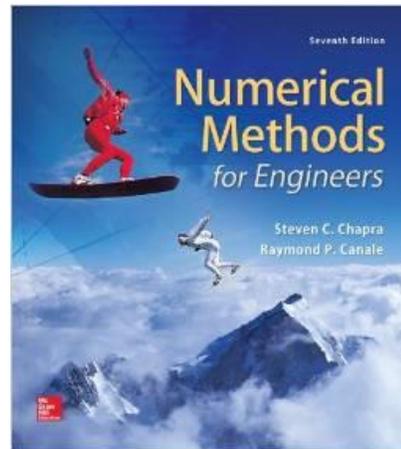
Course Objectives: The courses has three main objectives

1. We will focus on how to formulate a variety of analysis problems
2. We will discuss the underlying characteristics of basic numerical methods
3. We will explore the application of a number of computer implementations of computational methods using Matlab

Course Contents: SAKAI portal: <https://sakai.rutgers.edu/portal/site/30b6ba7f-f0c3-4917-89cd-3e7c04dc14cd>

Topics: Regression, interpolation, root finding and parameter estimation; Solution of systems of linear and non-linear equations; Formulation and solution of optimization problems; Numerical differentiation and integration; Solution of ODEs (Initial and Boundary Value Problems) using finite difference and shooting methods; Introduction to the solution of PDEs. **The detailed day-by-day scheduled is provided in the document "Lectures" also uploaded on Sakai.**

Course Textbook: *Numerical Methods for Engineers*, Chapra and Canale, either 6th or 7th edition is appropriate. Sections to be covered are identified based on these two editions.



On-line material: For each topic discussed in class I am providing on-line tutorials on YouTube which were developed **specifically** for our text book and reflect **precisely** the material covered in class with the exception of the module on optimization). **YOU ARE EXPECTED TO WATCH THE YouTube VIDEOS prior to class and as a follow-up to the corresponding lecture(s)!**

All students are strongly encouraged to review their Matlab skills.

Academic Integrity:

Students are expected to adhere to the *Policy on Academic Integrity* listed within the New Brunswick Undergraduate Catalogue and at <http://academicintegrity.rutgers.edu/>. Students are encouraged to review this policy.

ABET Outcomes and Assessment:

Outcome (a): *an ability to apply knowledge of mathematics, science and engineering*

Outcome (c): *an ability to design a system, component, or process to meet desired needs*

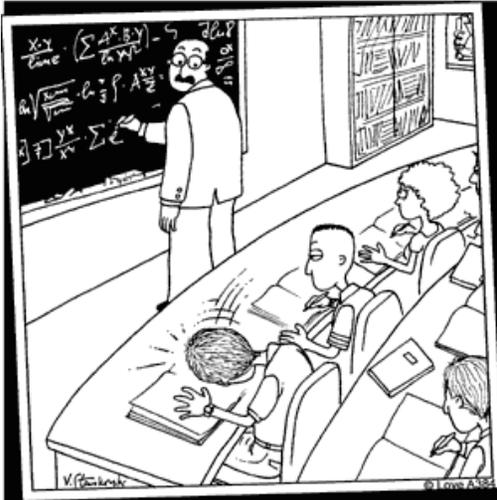
Outcome (e): *an ability to identify, formulate, and solve engineering problems*

Outcome (k): *an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice*

Schedule: Please see accompanying document

Assessment: The grade in the class will be based on three exams – equally weighted. I will extensively discuss in class the expectations and format of each exam. Briefly, the exams will be computer-based and will involve the solution of problems using Matlab. The exam will be “take home” during the class period of the corresponding exam data. However, I will extensively discuss the details of the exams in class. **Important note:** 15% of the exam grade will reflect the proper and correct presentation of the results and associated Matlab codes. Once again, I will **extensively** discuss the details in class. Also in class, we will work numerous practice problems in order to clarify all and any issues and questions you may have.

Attendance I do not make attendance mandatory. I will work hard to create a fun and interesting teaching environment so that students will want to come to class. However, I would also like to emphasize that the class will be interactive and therefore in class we will, repeatedly, address questions and issues important for the exams. Therefore, class attendance is highly recommended. My goal/hope is to create an environment which encourages questions and active participation!



Professor Herman stopped when he heard that unmistakable thud – another brain had imploded.

Undergradese

What undergrads ask vs. what they're REALLY asking

“Is it going to be an open book exam?”
Translation: “I don’t have to actually memorize anything, do I?”

“Hmm, what do you mean by that?”
Translation: “What’s the answer so we can all go home.”

“Are you going to have office hours today?”
Translation: “Can I do my homework in your office?”

“Can I get an extension?”
Translation: “Can you re-arrange your life around mine?”

“Is grading going to be curved?”
Translation: “Can I do a mediocre job and still get an A?”

“Is this going to be on the test?”
Translation: “Tell us what’s going to be on the test.”

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