

ENGI 9420 Engineering Analysis Course Outline and Evaluation Scheme

2012 Fall
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The Memorial University of Newfoundland Code

“All members of the Memorial University of Newfoundland Community, which includes students, faculty, and staff, shall treat others with respect and fairness, be responsible and honest, and uphold the highest standards of academic integrity.”

Statement of Expectations of Student Conduct

“Like Professional Engineers, engineering students are expected to behave in a professional manner at all times. Students are encouraged to conduct themselves in a manner consistent with the PEG-NL code of ethics. MUN has two sets of rules which deal with inappropriate behaviour by students. The first set deals with academic offences such as cheating while the other set deals with non-academic offences such as disruptive behaviour in class. Both sets of rules can be found in the University Calendar under Regulations. It is strongly recommended that students read and follow these rules because the penalties can be severe, the severest being expulsion from the University.”

Note: Lectures take place on Mondays and Tuesdays in EN 4008 from 15:00 to 17:00

Overview of the Course

This course is intended to provide a foundation in mathematics for graduate students in all engineering disciplines. There are brief reviews of several mathematical topics that graduate students in any engineering discipline should have encountered during their first degree. An introduction is provided to other topics that many graduate students will not have met during their undergraduate studies, but which may be needed during their chosen careers.

Most of the resources for this course are available on the course web site,
"<http://www.engr.mun.ca/~ggeorge/9420/>".
Visit this web site often!

Contents

1. **Ordinary Differential Equations**
2. **Matrix Algebra**
3. **Numerical Methods**
4. **Stability Analysis**
5. **Gradient Operators**
6. **Calculus of Variations** (introduction)
7. **Fourier Series** (brief review)
8. **Partial Differential Equations** [if time permits]

You should purchase a copy of the lecture notes from the University Bookstore as soon as possible.

These lecture notes contain deliberate gaps, which will be filled in during the lectures. A complete version of the notes for each lecture, with the gaps filled in, will be posted on the web site "<http://www.engr.mun.ca/~ggeorge/9420/>" after that lecture.

Assignment questions and solutions will be made available on this web site **only**.

Assignments will be due approximately once every two weeks during the semester. Collectively, the best five assignments are worth **30%** of the final grade.

The *tentative* schedule of assignments is:

Assignment	Due date	Likely topics
1	Sept. 17	First order ODEs
2	Sept. 24	Second order ODEs, Laplace transforms,
3	Oct. 10	Series solutions of ODEs; Gaussian elimination; numerical methods
4	Oct. 22	Eigenvalues; stability analysis
5	Nov. 05	Stability analysis; gradient operators
6	Nov. 19	Calculus of variations; Fourier series

There will be one **mid term test**, worth **20%** of the final grade, on a date in October to be decided after consultation with the class, (probably October 15 or 16). Each student will be permitted to use one double-sided **formula sheet** of the student's own design, maximum size 8½"×11", during the test. There are no restrictions at all on the content of the formula sheet. Two such sheets may be used during the final examination.

The **final examination** will account for the remaining **50%** of the marks in this course and may cover any topics in the entire course.

You may need a **calculator** for the test and the final examination.

Only calculators with no capability for communication with other devices are permitted.

There is no one recommended **textbook**. However, you are encouraged to consult any textbook on advanced engineering mathematics that covers any part of the content of this course.

The Instructor's **office hours** are posted on the door of room EN 3047.
