

SAMPLE COURSE OUTLINE

Course Code, Number, and Title:

MATH 2485: Numerical Analysis

Course Format:

[Course format may vary by instructor. The typical course format would be:]

Lecture 4.0 h + Seminar 0.0 h + Lab. 2.0 h

Credits: 3.0

Transfer Credit: For information, visit bctransferguide.ca

Course Description, Prerequisites, Corequisites:

In this course, students are exposed to current techniques used in scientific computing. Topics include: solving linear and nonlinear equations, interpolation, integration, and numerical solutions of ordinary differential equations. Extensive use is made of Computer Algebra Systems (CAS), such as MATLAB and MAPLE.

Prerequisite(s): A minimum "C-" grade in MATH 1271, 1273, or 1275; and MATH 1252 or 2362. (Exposure to a high-level programming language or a programming course such as CPSC 1150 is recommended.) Prerequisites are valid for only three years.

Learning Outcomes:

Upon successful completion of this course, students will be able to...

- Use decimal, binary, and floating point representation of numbers, and error propagation, to estimate numerical error.
- Implement methods to solve nonlinear equations including, but not limited to, bisection method, secant method, fixed point iteration and Newtons method.
- Solve a system of linear equations numerically using Gaussian elimination, matrix factorization, partial pivoting, matrix inverse, and iterative methods.
- Implement interpolating polynomials using Lagrange form and error formula; Implement the Hermit and cubic spline interpolations.
- Implement numerical differentiation and integration techniques including finite differences, Richardson extrapolation, and Romberg integration.
- Solve numerically initial value problems using Eulers and Runge-Kutta methods; solve numerically systems of ordinary differential equations.
- Apply the concepts of convergence and stability to solving initial value problems numerically.

Instructor(s): TBA

Office: TBA

Office Hours: TBA

Phone: (604) 323-XXXX

Email: TBA

“This Sample Course Outline is for planning purposes only”.

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Textbook and Course Materials:

[Textbook selection may vary by instructor. An example of texts and course materials for this course might be:]

For textbook information, visit https://mycampusstore.langara.bc.ca/buy_courselisting.asp?selTerm=3|8

Note: *This course may use an electronic (online) instructional resource that is located outside of Canada for mandatory graded class work. You may be required to enter personal information, such as your name and email address, to log in to this resource. This means that your personal information could be stored on servers located outside of Canada and may be accessed by U.S. authorities, subject to federal laws. Where possible, you may log in with an email pseudonym as long as you provide the pseudonym to me so I can identify you when reviewing your class work.*

Assessments and Weighting:

Final Exam 35%

Other Assessments 65%

[An example of other assessments might be:]

Special Evaluation (SE) 5%

Assignments 15%

Labs 10%

Project 10%

Midterm 25%

Grading System:

Specific grading schemes will be detailed in each course section outline.

Grades	F	D	C-	C	C+	B-	B	B+	A-	A	A+
% Range	0-47	48-52	53-57	58-62	63-67	68-72	73-76	77-79	80-84	85-95	≥ 96

Topics Covered:

[Topics covered may vary by instructor. An example of topics covered might be:]

- Mathematical Preliminaries and Error Analysis
- Solutions of Equations in One Variable
- Interpolation and Polynomial Approximation
- Numerical Differentiation and Integration
- Initial-Value Problems for Ordinary Differential Equations
- Direct Methods for Solving Linear Systems
- Iterative Techniques in Matrix Algebra

As a student at Langara, you are responsible for familiarizing yourself and complying with the following policies:

College Policies:

[E1003 - Student Code of Conduct](#)

[F1004 - Code of Academic Conduct](#)

[E2008 - Academic Standing - Academic Probation and Academic Suspension](#)

[E2006 - Appeal of Final Grade](#)

[F1002 - Concerns about Instruction](#)

[E2011 - Withdrawal from Courses](#)

Departmental/Course Policies:

Information unavailable, please consult Department for details.

SAMPLE