



**School of Arts & Science
MATHEMATICS DEPARTMENT**

**MATH 185-X02
Technical Mathematics 1
2010 Q1**

COURSE OUTLINE

The Approved Course Description is available on the web @

<http://verjinschi.disted.camosun.bc.ca/>

Ω Please note: this outline will be electronically stored for five (5) years only.
It is strongly recommended students keep this outline for your records.

1. Instructor Information

(a)	Instructor:	Bogdan Verjinschi		
(b)	Office Hours:	Mo to F 11:30-12:20, Mo, W , F14:30-15:20		
(c)	Location:	CBA 151		
(d)	Phone:	4490	Alternative Phone:	
(e)	Email:	verjinschi @camosun.bc.ca		
(f)	Website:	http:// verjinschi.disted.camosun.bc.ca/		

2. Intended Learning Outcomes

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Upon completion of this course the student will be able to:

1. Determine the sum, difference, and dot product (inner product) of two vectors. Determine the opposite of a vector. Determine variable components so that two given vectors are equal. Multiply a vector by a scalar.
2. Use the inner product to determine the length of a vector. Geometrically add and subtract vectors. Interpret geometrically the length of vector, scalar multiple of a vector, and opposite of a vector. State and use the properties of inner products.
3. Use inner products to determine the angle between vectors, the projection of vector **b** upon vector **a**, and the area of the parallelogram determined by two vectors.
4. Determine the dimension of a matrix. State and use the axioms of matrices. Add, subtract, and multiply two matrices. Multiply a matrix by a scalar.
5. Determine the inverse of a matrix by the Gauss-Jordan Method and by the Adjoint Matrix method.
6. Solve linear systems using the augmented matrix method, Cramer's Rule and by using inverse matrices.
7. Graph points and vectors in three-dimensions. Apply vector operations to three-dimensional vectors. Calculate the dot and cross product of three-dimensional vectors. Use dot products to find angles between three-dimensional vectors. Use the cross product to find the areas of triangles, parallelograms, and the volume of a pyramid.
8. Find the equation of a plane given a point on the plane and the normal to the plane. Find the equation of a plane given three points on the plane. Find the distance from a point to a plane. Find the equation of a line in three space given a point on the line and a vector parallel to the line. Find the equation of a line

- given two points on the line. Find the equation of a line in vector, scalar parametric, and standard form. Find the equation of the line of intersection of two planes. Find the distance from a point to a line. Find the distance between two lines.
9. Identify and employ the matrices for reflection, projection, counter clockwise rotation, and dilation and contraction operators in the R^2 and R^3 .
 10. Use linear algebra to construct equations of lines through 2 points, circles through 3 points, and a general conic through 5 points.
 11. Take limits and derivatives of functions using the limit definition. Find the slope of the tangent line to a curve. Use derivatives to determine velocity, acceleration, and rates of change of one variable with respect to another.
 12. Use the power rule, chain rule, product, quotient rule, and implicit differentiation to differentiate polynomial functions, trigonometric functions, logarithm functions and exponential functions.
 13. Find tangents and normal to given functions. Solve problems involving related rates, curve sketching, and applied maximum and minimum problems. Find velocity and acceleration for parametrically defined curves.

3. Required Materials

(a) Texts: Allyn J. Washington, *Basic Technical Mathematics with Calculus, SI version*, 9th edition, Pearson Education Canada

Matrix Algebra course materials (available in bookstore).

4. Course Content and Schedule

(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

Outline

Week	Date	Section #	Title
Week 1	Sep 27	23.1	Limits
	Sep 28	23.1	"
	Sep 29	23.2	Slope of Tangent to Curve
	Sep 30	23.3	The Derivative
	Oct 1	23.3	"
Week 2	Oct 4		One extra hour for algebra review in Chapter 23
	Oct 5	23.4	Instantaneous Rates of Change
	Oct 6	23.5	Derivatives of Polynomials
	Oct 7	23.6	Derivatives of Products and Quotients
	Oct 8	23.6	"
Week 3	Oct 11		Thanksgiving Day
	Oct 12	23.7	Derivative of a Power of a Function and Chain Rule
	Oct 13	23.7	"
	Oct 14	23.8	Differentiation of Implicit Functions
	Oct 15		Quiz 1
Week 4	Oct 18	23.8	Differentiation of Implicit Functions (Continued)
	Oct 19	24.1	Tangents and Normals
	Oct 20	24.2	Newton's Method
	Oct 21	24.3	Curvilinear Motion
	Oct 22	24.4	Related Rates
Week 5	Oct 25	24.4	"
	Oct 26	24.5	Using Derivatives in Curve Sketching
	Oct 27	24.5	"
	Oct 28	24.6	More on Curve Sketching
	Oct 29		Quiz 2

Week 6	Nov 1	24.7	Applied Max/Min Problems
	Nov 2	24.7	"
	Nov 3	24.8	Differentials and Linear Approximation
	Nov 4	24.8	"
	Nov 5	25.1	Antiderivatives
Week 7	Nov 8	25.2	The Indefinite Integral
	Nov 9	25.2	"
	Nov 10	25.3	The Area Under a Curve
	Nov 11		Remembrance Day
	Nov 12		Quiz 3
Week 8	Nov 15	25.4	The Definite Integral
	Nov 16	25.5	The Trapezoidal Rule (Simpson's Rule time permitting)
	Nov 17	25.5	"
	Nov 18	MA 7.1-7.2	Substitution & Elimination Methods for Solving Systems
	Nov 19	MA 8.1	Matrices and Linear Systems
Week 9	Nov 22	MA 8.1	"
	Nov 23	MA 8.2	Operations with Matrices
	Nov 24	MA 8.3	The Inverse of a Square Matrix
	Nov 25	MA 8.4	The Determinant of a Square Matrix
	Nov 26		Quiz 4
Week 10	Nov 29	MA 8.5	Cramer's Rule
	Nov 30	V1	Vectors and Scalars
	Dec 1	V2	Magnitudes, Directions and Components of Vectors
	Dec 2	V3	The Dot Product
	Dec 3	V4	The Cross Product
Week 11	Dec 6		Vector Applications
	Dec 7		Vector Applications
	Dec 8		Review
	Dec 9		Review
	Dec 10		Review
Exam period	Dec 12-18&20,21		

5. Basis of Student Assessment (Weighting)

(Should be linked directly to learning outcomes.)

- (a) Assignments Weekly (with solutions posted)
(b) Quizzes 5 50% of the Final Mark
(c) Exam 50% of the Final Mark*

*If your final exam grade is higher than your term work grade and your term work is **50% or higher**, then your final exam grade will count as 100% of your final grade.

6. Grading System

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6

73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at camosun.ca for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. <i>(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)</i>
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services and on the College web site in the Policy Section.

