



**School of Arts & Science**  
**MATHEMATICS DEPARTMENT**  
**MATH 175-X01**  
**Mathematics for Electronics – 5**  
**2008Q3**

## COURSE OUTLINE

### 1. Instructor Information

(a)	Instructor:	Raymond Lai		
(b)	Office Hours:	See the schedule below, or by appointment		
(c)	Location:	Centre for Business and Access (CBA) Room 152		
(d)	Phone:	370-4491	Alternative Phone:	
(e)	Email:	<a href="mailto:lai@camosun.bc.ca">lai@camosun.bc.ca</a>		
(f)	Website:	<a href="http://lai.disted.camosun.bc.ca/">http://lai.disted.camosun.bc.ca/</a>		

	Monday	Tuesday	Wednesday	Thursday	Friday
07:30-08:20	Office Hour	Office Hour	Office Hour	Office Hour	Office Hour
08:30-09:20	Math 175(X01) TEC 173	Office Hour	Math 175(X01) TEC 173	Office Hour	Math 175(X01) TEC 173
09:30-10:20	Math 175(X01) TEC 173	Office Hour	Math 175(X01) TEC 173	Office Hour	Math 175(X01) TEC 173
10:30-11:20	Office Hour	Office Hour	Office Hour	Office Hour	Office Hour
11:30-12:20	Office Hour	Office Hour		Office Hour	Office Hour
12:30-1:20	Office Hour	Office Hour			Office Hour
1:30-2:20					

### 2. Intended Learning Outcomes (Source: 2008-2009 College Calendar)

Topics include: methods of integration, Maclaurin and Taylor series, differential equations, Laplace transforms, and Fourier series.

### 3. Required Materials

(a)	Texts	Washington, Allyn J., <i>Basic Technical Mathematics with Calculus</i> , 8th Edition, Addison-Wesley Publishing Company.
(b)	Other	Regular scientific (non programmable, non-graphing) calculator

#### 4. Course Content and Schedule

**Prerequisites** Math 174B

##### *Organization*

In-class workload: 6 hours lecture per week

Out-of-class workload: 6 to 10 hours per week (or more for students with weak background)

31 March 2008 (Monday): First Lecture

14 April 2008 (Monday): Last day to drop quarter courses (Fee Deadline)

19 May 2008 (Monday): Victoria Day, College Closed

20 May 2008 (Tuesday): Last day to withdraw without a failing grade

2 June 2008 (Monday): Last day to request deposit refund after complete withdrawal ALL Quarter 4 '08 courses

13 June 2008 (Friday): Last Lecture

##### *Tentative Course Content*

The course will follow the textbook fairly closely, covering the following topics:

#### Methods of Integration

Reference (week)	Topic
28-1 (1)	The General Power Formula
28-2 (1)	The Basic Logarithmic Form
28-3 (1)	The Exponential Form
28-4 (1)	Basic Trigonometric Forms
28-5 (2)	Other Trigonometric Forms
28-6 (2)	Inverse Trigonometric Forms
28-7 (3)	Integration by Parts
28-8 (3)	Integration by Trigonometric Substitution
28-9 (3)	Integration by Partial Fractions (nonrepeated linear)
28-10 (4)	Integration by Partial Fractions (other cases)
28-11 (4)	Integration by the Use of Tables

#### Expansion of Functions in Series

Reference (week)	Topic
29-1 (4)	Infinite Series
29-2 (5)	Maclaurin Series
29-3 (5)	Certain Operations with Series
29-4 (5)	Computations by Use of Series Expansions
29-5 (5)	Taylor Series
29-6 (5)	Introduction to Fourier Series
29-7 (6)	More about Fourier Series

## Differential Equations

Reference (week)	Topic
30-1 (6)	Solutions of Differential Equations
30-2 (7)	Separation of Variables
30-3 (7)	Integrable Combinations
30-4 (7)	The Linear Differential Equation of the First Order
30-5 (7)	Elementary Applications
30-6 (7)	Higher-Order Homogeneous Equations
30-7 (8)	Auxiliary Equations with Repeated or Complex Roots
30-8 (9)	Solutions of Non-homogeneous Equations
30-9 (9)	Applications of Second-Order Equations (simple examples)
30-10 (9)	Laplace Transforms
30-11 (9)	Solving Differential Equations by Laplace Transforms

### More on Laplace Transforms

Notes 1 (10)	Laplace Transforms of Step and Ramp Functions
Notes 2 (10)	Laplace Transforms of Periodic Functions
Notes 3 (10)	Convolution Theorems

## 5. Basis of Student Assessment (Weighting)

### Assignment

- Refer to the end of this outline for a list of suggested exercises from the textbook. Solutions will be posted on the class's website. You can also find a copy of the solution guide on reserve in the library (it contains complete solution for both odd- and even-numbered exercises).

### Term Tests

- There will be 5 term tests, one on each of the following weeks:

week 2	week 4	week 6	week 8	week 10
7 – 11, April	21 – 25, April	5 – 9, May	19 – 23, May	2 – 6, June

- Complete understanding of the examples discussed in class and the suggested exercises from the textbook will be essential for success on the term tests.
- There is NO makeup. **Medical excuse must be accompanied by a physician's note.**
- Complete solutions will be posted online on the class's website.

### Final Examination

- The final exam will cover the entire course and will be 3 hours long.
- As stated on page 34 in the current college calendar 2007 – 2008, "students are expected to write tests and final examinations at the scheduled time and place." Exceptions will only be considered due to **emergency** circumstances as outlined in the calendar. Holidays or scheduled flights are not considered to be emergencies.
- Final examination period June 16 – 20 (specific date, time, and location TBA)

The final grade will be calculated according to the following breakdown:

5 Term Tests	Final Exam.
$5 \times 10\% = 50\%$	50%

Note: For grade inquiry, email your request with your Camosun student ID no.

## 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

Note: MATH 175 is a prerequisite for ELEX 240 and ELEX 250.

### 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](http://camosun.ca) for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
<b>I</b>	<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.
<b>IP</b>	<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. (For these courses a final grade will be assigned to either the 3 <sup>rd</sup> course attempt or at the point of course completion.)
<b>CW</b>	<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](http://www.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.

*How to do well in the course and where to get help*

1. Do not skip classes.
2. Start working on the exercises as soon as we finish a section.
3. Studying in groups is an efficient way to learn mathematics; however, make sure you can solve problems yourself.
4. Extra help available from assistant at the Interurban Math Room: Technologies Centre (TEC) Room 142 (phone: 370-4492). This drop-in centre is freely available for your use to work on math homework and to seek help from the tutor on staff (see hours posted on door).
5. 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, Registrar's Office or the College web site at <http://www.camosun.bc.ca>**
6. **Need a tutor/Want to become a tutor? Visit [http://www.camosun.bc.ca/resources/ses/tutors\\_list.php](http://www.camosun.bc.ca/resources/ses/tutors_list.php)**

Suggested Examples to study and Exercises to practice

Washington, Allyn J., Basic Technical Mathematics with Calculus, 8th Edition

Section (Page)	Examples	Exercises [Answers for even-numbered exercises]
28.1 (834)	1 to 5	5, 13, 17, 21, 23, 25, 35
28.2 (837)	1, 3 to 7	5, 11, 15, 21, 27, 29, 41
28.3 (840)	1 to 6	9, 13, 17, 19, 23, 37
28.4 (844)	1 to 6	13, 15, 17, 19, 21, 23, 25, 34 [584 sin(377t)]
28.5 (848)	1 to 7	5, 7, 8 [(cos <sup>9</sup> x)/9 - (cos <sup>7</sup> x)/7 + C] 13, 15, 17, 19, 41
28.6 (852)	2 to 7	7, 9, 13, 15, 19, 21, 25, 26 [(3/2)arctan(2x) - (1/4)ln(4x <sup>2</sup> + 1) + C], 35
28.7 (856)	1 to 6	4 [(1/4)sin(2x) - (x/2)cos(2x) + C], 5, 7, 8 [(√2π/4) - ln(√2 + 1)], 9, 11, 13, 14 [(x <sup>3</sup> /3)ln x + (2(ln 2)/3)x <sup>3</sup> - x <sup>3</sup> /9 + C], 15, 16 [(e <sup>2</sup> - 1)/4], 18 [-(1/5)e <sup>-x</sup> sin(2x) - (2/5)e <sup>-x</sup> cos(2x) + C], 31
28.8 (859)	1 to 4	11, 13, 15, 17, 19, 21, 31
28.9 (863)	2 to 4	11, 13, 14 [(5/4)ln 13 - (5/4)ln 5 - ln 3], 17, 18 [(1/2)ln(32/27)], 19, 20 [(17/12)ln x - 2  - (19/4)ln x + 2  + (4/3)ln x + 1  + 2x + C], 30 [1.792 C]
28.10 (868)	1 to 5	5, 7, 8 [-3/(2(x+1) <sup>2</sup> ) + ln x + 1  + 2 ln x  + C], 9, 11, 17, 18 [(3/2)ln(x <sup>2</sup> + 4) + ln x - 2  + ln x + 2  + C] 19, 20 [arctan x + x/(x <sup>2</sup> + 1) - (1/2)ln(x <sup>2</sup> + 1) + ln x + 1  + C], 26 [0.0001897 C or 189.7 μC]
28.11 (870)		5, 15, 23, 25, 27, 33, 40 [5 × 10 <sup>-9</sup> V], 44 [kqQx/(b√x <sup>2</sup> + b <sup>2</sup> ) + C]
29.1 (878)	1 to 4	5, 7, 8 [a <sub>1</sub> = 3/2, a <sub>2</sub> = 5/6, a <sub>3</sub> = 7/12, S <sub>1</sub> = 3/2, S <sub>2</sub> = 7/3, S <sub>3</sub> = 35/12], 13, 15, 19, 23, 29
29.2 (883)	1 to 6	5, 7, 8 [1 - 2x + 2x <sup>2</sup> + ...], 9, 13, 15, 16 [4x - 8x <sup>2</sup> + (64/3)x <sup>3</sup> - ...], 17, 31
29.3 (887)	1 to 5	7, 9, 10 [-x <sup>3</sup> - x <sup>4</sup> /2 - x <sup>5</sup> /3 - x <sup>6</sup> /4 - ...], 11, 12 [0.3886], 13, 15, 17, 32 [c(6a - 6a <sup>2</sup> t <sup>2</sup> - 33a <sup>3</sup> t <sup>3</sup> + 35a <sup>4</sup> t <sup>4</sup> )]
29.4 (891)	1, 2, 4 to 6	5, 9, 10 [0.0697565], 11, 21, 25, 33
29.5 (894)	1 to 4	11, 17, 20 [1.131], 23, 24 [1.036], 25, 32 [ln 2 - 1/(2L)(x - L) + 3/(8L <sup>2</sup> )(x - L) <sup>2</sup> ]
29.6 (900)	1 to 3	5, 7, 11, 19, 20 [L = 25π/2 - (100/π)cos(2t) + (200/π)sin t - (200/(9π))sin(3t) + ...]
29.7 (906)	2, 4, 5 to 10	13, 14 [f(x) = (4/π)sin(πx/2) + (4/(3π))sin(3πx/2) + (4/(5π))sin(5πx/2) + ...], 15, 17, 21, 22 [f(x) = ∑ <sub>n=1</sub> <sup>∞</sup> {(-1) <sup>n+1</sup> 8/(nπ) + 16/(n <sup>3</sup> π <sup>3</sup> )}((-1) <sup>n</sup> - 1} sin(nπx/2)]

30.1 (912)	1, 3 to 5	5, 9, 19, 21, 31
30.2 (916)	1, 3 to 5	5, 11, 21, 25, 35, 37, 39
30.3 (918)	1, 2, 4	5, 7, 13, 21
30.4 (921)	1 to 5	9, 13, 21, 25, 31, 33
30.5 (925)	1, 2, 4	6 $\left[ y = \sqrt{2x^2 + 7} \right]$ , 10 $\left[ x^2 + 3y^2 = c \right]$ , 30 $\left[ i = 0.020e^{-15t} \right]$ , 32 $\left[ i = 2.0 - 2.0 \times 10^{-4} (100 - t)^2 \right]$ , 34 $\left[ 0.00000008 \text{ C} = 80 \text{ nC} \right]$ , 67
30.6 (931)	4 to 6	7, 11, 17, 25, 27, 29, 30 $\left[ y = c_1 e^x + c_2 e^{2x} + c_3 e^{3x} \right]$ , 31
30.7 (935)	3 to 8	13, 21, 24 $\left[ y = c_1 + e^{-x/30} (c_2 + c_3 x) \right]$ , 29 [Hint: $m^3 - 6m^2 + 12m - 8 = (m - 2)^3$ ], 31, 33, 34 $\left[ y = \sqrt{3} \sin \frac{4x}{3} - \cos \frac{4x}{3} \right]$ , 35
30.8 (939)	1 to 9	21, 23, 25, 27, 29, 31, 35
30.9 (946)	4, 5	13, 15, 17, 19, 21
30.10 (951)	1 to 7	2, 5, 7, 9, 11, 16 $\left[ (s^2 - 3s + 2)L(f(t)) + s - 5 \right]$ , 21, 23
30.11 (955)	1 to 3, 5 to 7	19, 27, 35

Supplementary Notes on Laplace Transform

(Page) Example	(Page) Exercises
(3) 1	(3) 2, 3, 4, 5, 7
(6) 1	(7) 1, 2, 4, 5, 6
(9) 1 to 3	(10) 2, 3, 5, 6, 9, 10, 11, 12, 13