

	<p><b>School of Arts &amp; Science</b>  <b>MATHEMATICS DEPARTMENT</b></p> <p><b>MATH 220-001</b>  <b>Multivariate Calculus</b>  <b>2017F</b></p>
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## COURSE OUTLINE

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### 1. Instructor Information

(a)	Instructor:	Dan Bergerud
(b)	Office Hours:	11:30 – 12:30 each day
(c)	Location:	Ewing 264
(d)	Phone:	250-370-3495 (24 hr. voice mail);
(e)	Email:	bergerud@camosun.bc.ca
(f)	Website:	

### 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. Solve three dimensional geometry problems involving points, lines, planes, vectors, vector projections, and distances.
2. Sketch, differentiate, and integrate vector-valued functions to find velocities, accelerations, tangents, and normals.
3. Differentiate functions of many variables and use chain rules to differentiate composite functions. Compute gradients and directional derivatives.
4. Setup and evaluate multiple integrals to find areas, volumes, masses, centres of mass, and moments of inertia.
5. Change variables in multiple integrals to cylindrical, spherical, or general coordinates.
6. Compute the divergence or curl of a vector field, and find the potential function for conservative fields.
7. Setup and evaluate line and surface integrals.
8. Use Stokes theorem and the divergence theorem to evaluate line and surface integrals.

### 3. Required Materials

Texts: Larson, Hostetler, and Edwards, *Multivariable Calculus*, 10th Edition, Houghton Mifflin, 2014.

### 4. Course Content and Schedule

Chapter 11: Vectors and the Geometry of Space.

11.1 - 11.7

Chapter 12: Vector-Valued Functions.	12.1 - 12.5
Chapter 13: Functions of Several Variables.	13.1 - 13.10
Chapter 14: Multiple Integration.	14.1 - 14.8
Chapter 15: Vector Analysis.	15.1 - 15.8

## 5. Basis of Student Assessment (Weighting)

*(Should be linked directly to learning outcomes.)*

- (a) Assignments 20%
- (b) Midterm 30%
- (c) Final Exam 50%

## 6. Grading System

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

### 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](http://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.

<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. <i>(For these courses a final grade will be assigned to either the 3<sup>d</sup> course attempt or at the point of course completion.)</i>
<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://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.