

COURSE INFORMATION

| Course Title | Course Code Number | Credit Value |
|-----------------------------------|--------------------|--------------|
| Multivariable and Vector Calculus | MATH 217 | 4 |

PREREQUISITES

A score of 68% or higher in one of PHYS 101, PHYS 107, PHYS 117, PHYS 153, PHYS 157, SCIE 001 and a score of 68% or higher in one of PHYS 102, PHYS 108, PHYS 118, PHYS 153, PHYS 158, SCIE 001 and a score of 68% or higher in one of MATH 101, MATH 103, MATH 105, MATH 121, SCIE 001.

COREQUISITES

One of MATH 152, MATH 221, MATH 223.

CONTACTS

| Course Instructor | Contact Details | Office Location | Office Hours |
|-------------------|--------------------|-----------------|------------------|
| Stephen Gustafson | gustaf@math.ubc.ca | Math Bldg. 115 | Mon 2-3, Fri 1-2 |

COURSE STRUCTURE

I will mainly use a traditional lecture style for this course, but I will expect students to participate in some active work in class. I will post lecture notes.

LEARNING MATERIALS

Texts: *CLP-3 Multivariable Calculus Textbook* and *CLP-4 Vector Calculus Textbook* by Joel Feldman, Andrew Rechnitzer, and Elyse Yeager.

These locally developed texts are available at <http://www.math.ubc.ca/~CLP>. The companion Problem Books (draft versions) to these texts, available at the same site, will also be useful.

I will post assignments, lecture notes, and other course materials on Canvas. Students should sign up (through Canvas) to our Piazza page, and use it as a questions and answer forum.

SCHEDULE OF TOPICS

Here is our expected progress through the course laid out in weeks. A week is roughly 4 lecture hours. Corresponding sections of the texts are listed. Note the expected dates of the tests.

Week 0: coordinates, vectors, dot and cross products, lines and planes (CLP3: 1.1-1.5)

Week 1: curves, tangents, arc length, sketching surfaces, (CLP3: 1.6-1.9)

Week 2: functions of several variables, limits and continuity, partial derivatives, higher-order derivatives, equality of mixed partials (CLP3: 2.1-2.3)

Week 3: chain rule (CLP3: 2.4); Test #1 (Thursday, Sep. 26)

Week 4: tangent planes and linear approximation, directional derivatives and the gradient (CLP3: 2.5-2.7)

Week 5: maxima and minima, Lagrange multipliers (CLP3: 2.9-2.10);

Week 6: double integrals, volumes, double integrals in polar coordinates (CLP3: 3.1-3.2); Test # 2 (Thursday, Oct. 17)

Week 7: applications of double integrals, triple integrals, triple integrals in cylindrical and spherical coordinates (CLP3: 3.3-3.7)

Week 8: vector fields, line integrals, path independence (CLP4: 2.1-2.4, 1.6); Test # 3 (Thursday, Oct. 31)

Week 9: parameterized surfaces, surface integrals (CLP4: 3.1-3.5)

Week 10: gradient, divergence, curl (CLP4: 4.1); Test #4 (Thursday, Nov. 14)

Week 11: the divergence theorem, Green's theorem (CLP4: 4.2,4.3)

Week 12: Stokes' theorem (CLP4: 4.4); examples and applications

LEARNING OUTCOMES

A list of learning goals will be posted on the course Canvas site.

ASSESSMENTS OF LEARNING

Grading Scheme:

Your grade normally will be computed based on the following formula: **50% Final Exam + 30% Tests (best 3 of 4) + 10% WebWork Assignments + 10% Written Homework.** Please note that *grades may be scaled.*

Course Policies:

- There are 4 tests during the term. There are *no make-up tests*. Missing a test for a valid reason normally results in the weight of that test being re-distributed to the remaining tests and final exam. Any student who misses a test is to present the Department of Mathematics self-declaration form for reporting a missed assessment to their instructor within 72 hours of the midterm date. This policy conforms with the UBC Vancouver Senate's Academic Concession Policy V-135 and students are advised to read this policy carefully.
- No calculators or other electronic devices will be allowed for the tests and final exam. Nor will formula sheets or other memory aids.
- Each week there will be an online Webwork homework set, accessed from Canvas. There will also be written homework assignments in the weeks without tests. Late assignments (online, or written) are not accepted.

The UBC Vancouver Senate's Academic Concession Policy V-135 applies to all assignments in this course, and students are advised to read this policy carefully.

Note that the intent of homework is to help you learn the material, and therefore it should be done as you are studying. Data show that students who leave their homework to the night before do poorly in the course.

UNIVERSITY POLICIES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the UBC Senate website.

LEARNING RESOURCES

The Math Learning Centre is in LSK 301. Graduate student TAs are there to help you during the posted hours.

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