MATH_V 217 101 2025W1 Multivariable and Vector Calculus

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MATH 217 Multivariable and Vector Calculus

Contact info:

- Instructor: Prof. Jim Bryan, **jbryan@math.ubc.ca (mailto:jbryan@math.ubc.ca)**
- Teaching Assistant: Elahe Mollahedar, **elahemh@math.ubc.ca (mailto:elahemh@math.ubc.ca)**

Course Structure:

Lectures will be live:

- Tuesday and Thursdays, 9:30 am to 11:00 am. Blackboard lecture live from IRC Floor G room 4.
- Wednesdays, 11:00 am to 12:00 pm. Blackboard lecture live from IRC Floor G room 4.
- Office hours: Thursdays 1pm-2pm, Math 226.
- TA Office hours: TBA

Learning Materials:

- Main Text: 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 **here (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 my lecture notes under "pages"-->"notes"
- I will post practice midterms and finals before each midterm and final.
- Piazza: Access our course Piazza page from Canvas. The TA and I will answer questions there.

Webwork

Weekly webwork assignments will appear on the Assignments tab in Canvas. Assignments are due on Tuesdays at midnight. **Always access the webwork assignment through the link in Canvas** (otherwise the grades don't sync correctly).

Assessment of Learning:

There will be weekly webwork assigned as well as at least two midterms (I am currently planning on two midterms, but this may change). The course grade will normally be given by the *better* of the following two schemes:

- 50% Final Exam + 35% Midterm grades + 15% WebWork Grade, or
- Scaled Final Exam grade - 10

Please note that grades may be scaled.

Course Policies:

- There will be (at least) two midterms during the term. There are no make-up midterms. Missing a midterm for a valid reason normally results in the weight of that midterm being re-distributed to the remaining midterm and final exam. Any student who misses a midterm is to present the **[Department of Mathematics self-declaration form](https://owncloud.math.ubc.ca/index.php/s/mumsWsljdjR1idJ#pdfviewer)** 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.

Learning outcomes:

Here is a list of learning outcomes: **[skills.pdf (https://canvas.ubc.ca/courses/168716/files/41133445/download?wrap=1)](https://canvas.ubc.ca/courses/168716/files/41133445/download?wrap=1)** ↓ **[(https://canvas.ubc.ca/courses/168716/files/41133445/download?download_frd=1)](https://canvas.ubc.ca/courses/168716/files/41133445/download?download_frd=1)**

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.

Weeks 0 and 1 (Sept 3th-11th): Intro, coordinates, vectors, dot and cross products, lines and planes (CLP3: 1.1-1.5)

Week 2 (Sept 16th-18th): curves, tangents, arc length, sketching surfaces, (CLP3: 1.6-1.9)

Week 3 (Sept 23rd-Sept 25th): functions of several variables, partial derivatives, higher-order derivatives, equality of mixed partials (CLP3: 2.1-2.3), tangent planes and linear approximation (CLP 2.5, 2.6), chain rule (CLP3: 2.4);

Week 4 (Sept 30th -Oct 2nd): directional derivatives and the gradient (CLP3: 2.5-2.7), classification of critical points (CLP 2.9)

Week 5 (Oct 7th-9th): maxima and minima, Lagrange multipliers (CLP3: 2.9-2.10);

Week 6 (Oct 14th-16th): double integrals, volumes, double integrals in polar coordinates (CLP3: 3.1-3.2); **First midterm in class on October 16th.**

Week 7 (Oct 21st-23rd): applications of double integrals, triple integrals, triple integrals in cylindrical and spherical coordinates (CLP3: 3.3-3.7)

Week 8 (Oct 28th-30th): vector fields, line integrals, path independence (CLP4: 2.1-2.4, 1.6);

Week 9 (Nov 4th - 6th): parameterized surfaces, surface integrals (CLP4: 3.1-3.5)

Week 10 (Nov 13th): **(Reading week)** surface integrals continued.

Week 11 (Nov 18th - 20th): gradient, divergence, curl (CLP4: 4.1); **Second midterm in class Nov 20th.**

Week 12 (Nov 25th -Nov 27th): the divergence theorem, Green's theorem, Stokes' theorem (CLP4: 4.2,4.3, 4.4)

Week 13 (Dec 2nd -Dec 4th): Differential Forms (CLP4: 4.7); review

Final exam: TBA