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<table>
<thead>
<tr>
<th><strong>COURSE TITLE:</strong></th>
<th>MTH_254: VECTOR CALCULUS I, Spring 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CRN:</strong></td>
<td>20020</td>
</tr>
<tr>
<td><strong>DAYS &amp; HOURS:</strong></td>
<td>Tuesday &amp; Thursday: 14:00 – 16:20</td>
</tr>
<tr>
<td><strong>LECTURE ROOM:</strong></td>
<td>ST204</td>
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<tr>
<td><strong>OFFICE:</strong></td>
<td>ST203</td>
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<tr>
<td><strong>OFFICE HOURS:</strong></td>
<td>Monday &amp; Wednesday 07:00-08:30 in ST203, ST101, or ST204, Saturday Open Lab: 09:00-13:00 in ST101 or ST204, or by appointment.</td>
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</tbody>
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**RECOMMENDED:** Free Maple Player or one of the Computer Algebra Systems (CAS) Maple 15 through Maple 18. Visit the [course download site](http://www.pcc.edu/ccog/default.cfm?fa=ccog&subject=MTH&course=254) for more information.

**COURSE DESCRIPTION:** Includes multivariate and vector-valued functions from a graphical, numerical, and symbolic perspective. Applies integration and differentiation of both types of functions to solve real world problems. Graphing calculator required. TI-89 Titanium or Casio Classpad 330 recommended. Prerequisites: MTH 253 and its prerequisite requirements. Audit available.

**OUTCOMES:** Upon successful completion students should be able to:

- Analyze real world scenarios to recognize when partial derivatives or multiple integrals of multivariate and vector valued functions are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.
- Appreciate partial derivative and multiple integral concepts that are encountered in the real world, understand and be able to communicate the underlying mathematics involved to help another person gain insight into the situation.
- Work with partial derivatives and multiple integrals in various situations and use correct mathematical terminology, notation, and symbolic processes in order to engage in work, study, and conversation on topics involving partial derivatives and multiple integrals with colleagues in the field of mathematics, science or engineering.
- Enjoy a life enriched by exposure to Calculus.

QUIZZES: Quizzes may be unannounced and may include a take home and/or group work portion. All work submitted for marking shall meet the criteria specified in the assignment submittal section of this syllabus. Assignments that do not meet these criteria may remain unmarked. There will be no make-up quizzes.

PROBLEM SETS: Problem Sets and Problem Set due dates are available online by following links from the course home page: http://spot.pcc.edu/~kkidoguc/m254_home.html.

Problem Sets will be marked as follows:

- Two problems from each Problem Set (PS) will be selected for marking and will each carry 5 marks for a maximum of 10 marks for technical merit.
- Each PS will carry 5 marks if all assigned problems have been attempted.
- Each PS will carry up to 5 marks for overall presentation quality.
- Each PS will carry a total of 20 marks.

N.B.: Each problem set (PS) constitutes a separate submission. For example, if PS5.1 and PS5.2 are stapled together and turned in as a single assignment, then PS5.2 will be returned unmarked. Further, each submittal shall meet the criteria specified in the assignment submittal section of this syllabus. Assignments that do not meet these criteria will remain unmarked.

EXAMINATIONS: There will be three in-class examinations: two midterm examinations and a final examination. Each examination will consist of a group presentation (mock examination) carrying 20 marks and a two part individual examination carrying 80 marks. The two-part individual examinations will consist of a no-technology portion and a technology-allowed portion.

Results from the final examination and the higher of the two midterm examinations will be used for end of term grade computation. The lower of the two midterm examination marks will be discarded. All examinations will be cumulative and will include material from assumed previous knowledge.

For all in-class examinations:

- use of one 8½” × 11” × 6 mil cheat sheet will be allowed,
- use of textbooks, lecture notes, and other supplementary materials will be forbidden.
- Any hint of cheating during an examination will result in a zero for all student work to that point in the term. The instructor will decide what constitutes a hint of cheating.

Make up examinations may be allowed in exceptional cases. Requests for a make-up examination shall be via typed, signed and dated letter from the student that presents compelling reasons that make the allowance of a make-up examination appropriate. Acceptance of this request shall be at the instructor's discretion.

PRESENTATION MARKS: Students are encouraged to write and speak using proper mathematical language and notation. Therefore, many assignments submitted for marking will carry presentation marks. These will be awarded based on the clarity and readability of the work submitted. Criteria for awarding presentation marks are described in the Assignment Submittal Requirements portions of this syllabus and online in Student Analysis Presentation Guidelines.
ASSIGNMENT SUBMISSION REQUIREMENTS: All out of class assignments shall be submitted at the start of the lecture period on the specified due date. Hard copy submissions shall be prepared on 8½” x 11” or A4 paper. Every assignment submitted for marking shall:

1. include, on the upper right hand corner of the back of the last sheet of the submittal, three lines that consists of the:
   a) student name (surname, first name),
   b) assignment number (e.g., “ps12.1” for the §12.1 problem set), and
   c) submission date (NOT due date).

2. provide legible, coherent presentations of problem solutions, with the problem being worked clearly identified and resulting conclusions and/or final solutions unambiguously stated,

3. have a one inch margin (border) surrounding every submitted sheet that shall be free of any markings that may obstruct insertion of instructor notes and/or comments, and

4. be clearly paginated at the bottom centre of every page (even for one page submissions).

Submissions not meeting all specified criteria (cf., Figure 1) may remain unmarked.

Figure 1: Assignment Submission Format Requirements

When electronic submissions are acceptable, all "hard copy" marking criteria specified above remain in effect. Additionally:

- filenames shall clearly identify the course number and assignment name,
- student name(s) shall be included at the start of the file,
- files shall be in a format accessible using a program available on EMIT,
- a submission with a virus will be discarded and the assignment will remain unmarked.

LATE ASSIGNMENTS: A late assignment must be accompanied by a signed and dated note from the student explaining the reason for the tardiness. Marking of late assignments will be at the instructor's convenience. Additionally, all late assignments are subject to a 50% per calendar day late penalty.
**Evaluation:** Student assessment will be based on the elements listed and weighted as indicated below.

<table>
<thead>
<tr>
<th>Evaluation Element</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Problem Sets</td>
<td>10%</td>
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<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm Examination (One of Two)</td>
<td>40%</td>
</tr>
<tr>
<td>Final Examination</td>
<td>40%</td>
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Each examination will include a graded group presentation. The final mark, $M_F$, will be the weighted mean of each element percentage. For example, at the end of the term a student has 90% for her problem sets, 75% for her quizzes, 53% for Midterm I, 78% for Midterm II, and 81% for her final examination. Her final mark would be:

$$M_F = (90)(0.1) + (75)(0.1) + (78)(0.4) + (81)(0.4) = 80.1$$

**Grades:** Traditional letter grades, defined in the Academic Policy Handbook, will be awarded as indicated below.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Interval</th>
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<tbody>
<tr>
<td>A</td>
<td>$90 \leq M_F &lt; 100$</td>
</tr>
<tr>
<td>B</td>
<td>$80 \leq M_F &lt; 90$</td>
</tr>
<tr>
<td>C</td>
<td>$70 \leq M_F &lt; 80$</td>
</tr>
<tr>
<td>D</td>
<td>$60 \leq M_F &lt; 70$</td>
</tr>
<tr>
<td>F</td>
<td>$M_F &lt; 60$</td>
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Other grade options are described at [http://www.pcc.edu/registration/grading-policy/](http://www.pcc.edu/registration/grading-policy/). Selection of a non-letter grade option must be student initiated.

**Email Notice:** Due to Federal laws and concerns about privacy, all email communication between instructor and student shall be done via [PCC assigned email address](http://www.pcc.edu/registration/grading-policy/). N.B.: email from non-PCC email accounts and/or email with an unspecified subject will be discarded.

**Resources:**
- Student Learning Centre (SY Library, [http://www.pcc.edu/resources/tutoring/](http://www.pcc.edu/resources/tutoring/)). District-wide tutoring information (includes math).
- Multicultural Centre (SY CC 202, [http://www.pcc.edu/resources/culture/](http://www.pcc.edu/resources/culture/)). One-on-one help for math courses, drop-in or by appointment.
- Mini Lab (SY ST104) – EMIT access.
- Student Computing Centre (SY Library, [http://www.pcc.edu/resources/computer-labs/sylvania/](http://www.pcc.edu/resources/computer-labs/sylvania/)). Internet access, mathematics computer programs, and more (orientation required).

**General Policies:**
- A student will be institutionally withdrawn from the class roster for an unexcused absence during the first week of the term.
- A student will be removed from class for any disruptive behaviour. This includes, but is not limited to, audible mobile phones.
- A student will be removed from class for inappropriate use of PCC property.
- Students are advised that PCC computers are subject to remote monitoring.
S TUDENT R IGHTS AND R ESPONSIBILITY S HANDBOOK:

Students are required to comply with the Student Rights and Responsibilities Handbook. Included are policies on Students Rights, Student Conduct, Grade Appeal, Academic Integrity, Consensual Relationship Statement, and Children on PCC properties. [http://www.pcc.edu/about/policy/student-rights/](http://www.pcc.edu/about/policy/student-rights/).

ADA ACCOMMODATION:

Students who experience disability-related barriers should contact Disability Services: [www.pcc.edu/disability](http://www.pcc.edu/disability). If students elect to use approved academic adjustments, they must provide, in advance, formal notification from Disability Services to the instructor.

T ITLE IX/N OND ISCRIMINATION S TATEMENT:

Portland Community College is committed to creating and fostering a learning and working environment based on open communication and mutual respect. If you believe you have encountered sexual harassment, sexual misconduct, sexual assault, or discrimination based on race, color, religion, age, national origin, veteran status, sex, sexual orientation, gender identity, or disability please contact the Office of Equity and Inclusion at (971) 722-5840 or equity.inclusion@pcc.edu.

C OLLEGE POLICIES AND DEADLINES REGARDING GRADES AND REGISTRATION STATUS:

- Adding and Dropping: [http://www.pcc.edu/registration/dropping.html](http://www.pcc.edu/registration/dropping.html)
- Grading Options: [http://www.pcc.edu/registration/grading-policy/](http://www.pcc.edu/registration/grading-policy/)

FLEXIBILITY STATEMENT:

The instructor reserves the right to modify course content and/or substitute assignments and learning activities in response to institutional, weather, or class situations.

AUDIO/VISUAL RECORDING POLICY

Students who wish to make an auditory or visual recording of any portion of the class must speak with the instructor ahead of time. Any such recording is for personal use only. It may not be shared, copied, uploaded to the Internet, and/or distributed without written permission from the instructor as well as any student who appears or is heard in the recording.