Portland Community College  
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<table>
<thead>
<tr>
<th>COURSE TITLE:</th>
<th>MTH_256: INTRODUCTION TO DIFFERENTIAL EQUATIONS, Fall 2017</th>
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</thead>
<tbody>
<tr>
<td>CRN:</td>
<td>40391</td>
</tr>
<tr>
<td>DAYS &amp; HOURS:</td>
<td>Monday and Wednesday 11:00 – 13:20</td>
</tr>
<tr>
<td>LECTURE ROOM:</td>
<td>ST101</td>
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<tr>
<td>OFFICE:</td>
<td>ST203</td>
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<td>OFFICE HOURS:</td>
<td>Monday &amp; Wednesday: 10:00 – 11:00, Tuesday &amp; Thursday: 13:30 – 14:30 in ST203 or ST101, Saturday Open Lab: 09:00-13:00 in ST204, or by appointment.</td>
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<td>RECOMMENDED:</td>
<td>Free Maple Player or one of the Computer Algebra Systems (CAS) Maple 18 or later. Visit the course download site for more information.</td>
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<tr>
<td>COURSE DESCRIPTION:</td>
<td>Includes a variety of differential equations and their solutions, with emphasis on applied problems in engineering and physics. Differential equations software will be used. Students communicate results in oral and written form. Graphing calculator required. TI-89 Titanium or Casio Classpad 330 recommended. Recommended: MTH 254. Audit Available. Prerequisites: MTH 252 and MTH 261. This is a one-term introduction to ordinary differential equations with applications. Topics include classification of, and what is meant by the solution of a differential equation, first-order equations for which exact solutions are obtainable, explicit methods of solving higher-order linear differential equations, an introduction to systems of differential equations, and the Laplace transform. Applications of first-order linear differential equations and second-order linear differential equations with constant coefficients will be studied</td>
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<td>OUTCOMES:</td>
<td>Upon successful completion students should be able to:</td>
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<td>- Analyze real world scenarios to recognize when ordinary differential equations (ODEs) or systems of ODEs 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.</td>
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<td>- Recognize ODEs and system of ODEs 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.</td>
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<td>- Work with ODEs and systems of ODEs in various situations and use correct mathematical terminology, notation, and symbolic processes in order to engage in work, study, and conversation on topics involving ODEs and systems of ODEs with colleagues in the field of mathematics, science or engineering.</td>
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<td>- Enjoy a life enriched by exposure to one of humankind’s great achievement.</td>
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</table>
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: Assignments are available at: http://spot.pcc.edu/~kkidoguc/m256_psl_174.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 submitted 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" x 11" x 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 (e.g., PCC MTH095 Guidelines).

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

[Diagram showing a page with margins and a note that looks like "Student name, Assignment #, Submission date"]

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>
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<tr>
<td>Final Examination</td>
<td>40%</td>
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</table>

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>$90 \leq M_F \leq 100$</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/. 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. 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/). District-wide tutoring information (includes math).
- Multicultural Centre (SY CC 202, 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/). 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.

### Student Rights and Responsibilities 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.

### Title IX/Non-Discrimination Statement:
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](mailto:equity.inclusion@pcc.edu).

### College 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.