

Math 253 / Calculus III / MWF 1:15pm-2:55 / CRN 20158 / GRV 110 / Sp'17

Instructor: Liz Coleman	Office: GRV 214	Office hours: M 10:30 to 12:30, GRV 214
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Textbook: (In electronic form) Calculus Early Transcendentals by James Stewart 8th ed.**
You have 2 choices through our COCC bookstore: (This is the same text we used in Calc's I & II.)

- 1) A "custom" textbook with no HW problems that comes bundled with access to WebAssign (WA) homework and eBook, ISBN: 9781305616691 @ \$172.50. If you want to save \$27, you can just purchase the web access to WA:
- 2) Lifetime of edition access to eBook and homework for \$125.75 – the eBook is the FULL text in electronic form. Note: it is possible to buy access directly from WA after you signed up for the class using the class key.

We have some copies of the 6th & 7th eds. of the full text on reserve in the library and a couple are available in the tutor center. There are very few differences between the 6th, 7th & 8th eds.

** If you had Math 251/2 last term, with the 8th edition and used WebAssign you will NOT need to purchase anything. You will just need to enroll yourself into the correct section to get access to the homework and ebook.

WebAssign key code for: 1:15pm-2:55 / CRN 20158: cocc 0094 0405

Calculator: TI83 or higher recommended.

Additional Materials: *Course pack for 253* (available on my directory page or from the bookstore, \$18.50), graphing calculator, ruler, a few colored pencils or pens, and graph paper. An organized notebook will be a big help to you. You should keep an organized notebook of all the work you do for your online homework. **If you ask me a homework question, I need to see the work you've already done on the problem.**

Prerequisites: You should have successfully, and recently, completed COCC's Math 252 or its equivalent with a grade of B- or better. If you decide to take this class even though you do not meet this prerequisite, be aware that you will have to work much harder to keep up with the class, and that you risk failing the class.

Course Content: In Math 253, we will learn about parametric and polar graphing, and the calculus of parametric and polar functions (Ch. 10). We will spend the middle half of the term working on an introduction to linear algebra. We will discuss the applications of all these topics in real world problems. We will learn about infinite sequences and series the last few weeks of the term (Ch. 11). Material will be provided in class, or accessible through WA, with activities, projects, and handouts, and with assigned reading. You are responsible for all material covered in class and in the reading.

Important Point! This class satisfies OSU's engineering requirement for Math 306. Contact me for the documentation if you need it.

Order of coverage: Chapter 10, Linear Algebra (Course Pack *see Additional Materials*), Chapter 11

To succeed in this course it is imperative that you are in class every day. Most concepts will be covered as they are described in the text so please read the sections ahead of time to have an idea of what's going on in class.

The end of the 7th week of the term is the last day to change from a grade to an audit, or vice versa. This date is also the last day to drop a course without receiving a W on your transcript. After the 7th week, and before the Wednesday prior to finals week, you may drop a course and receive a W on your transcript.

Other important dates:

April 7	Last day to begin attendance in a new class
April 14, 5pm	Tuition due and last day for full refund
May 19, 5pm	Last day to drop class with no grade on transcript
May 29	Memorial Day, Holiday, College Closed
June 7, 6pm	Last day to withdraw, receive a "W" grade (need instructor's signature)
June 12-16	Finals Week

Your grade will be determined on your scores from homework-electronic and written, labs, daily written problem (Problem of the Day), 2 tests, and a comprehensive final exam:

HOMEWORK (HW) (15%): Daily HW will be handled electronically through the WebAssign web page (WA) (5%) and there will be 2 to 3 written (WRHW) (10%) assignments per week, pencil only. You will have 5 chances to improve your WA-HW score as long as you complete the WA-HW before the deadline date. There are suggested due dates that are posted on each assignment and in class. You will get 5% bonus for getting your WA work submitted on or before those dates. The deadline date for the Ch. 10 WA-HW is the night before the test. Ch. 11's deadline is Tuesday of finals week. No electronic WA-HW can be submitted after deadline dates. Late WRHW will be accepted only up to a week late and at a 25% reduction.

LABS (10%): We will have approximately 7 labs this quarter at 100 pts each. They will be posted on my directory website. You will need to work in groups of 2-4 and hand in one lab "write-up" per group. It is very important that you are able to communicate mathematics to your classmates. The labs will be graded on neatness, completeness, as well as accuracy, and must be in pencil. You will get a 5% bonus for turning the **group** labs in on time and with at least 2 names. **Late labs will be reduced by 25% and accepted only up to a week late.**

PROBLEM OF THE DAY (10%): Every class day, except test days, we will start with the "Problem of the Day" (POD) at 10 points each day. You may work together on these and I will randomly select students to present their answers. I will collect the POD's at the end of class. I will base your total POD points earned on 90% of the total points possible throughout the term, **so no late POD's are accepted.** This policy allows for two missed POD's with no penalty. The problems will be from previous material or checks for understanding of key concepts.

TESTS (40%): We will have 2 tests this quarter. They are tentatively scheduled for the 4th week and 7th week, and the 10th week. There will be no make-up tests. Let me know ahead of time if we need to reschedule a test for you.

FINAL EXAM (25%): The comprehensive final is scheduled for **Monday, June 12th from 1:00-3:00pm in GRV 110**

I adhere to Central Oregon Community College's standards as they are discussed in the Student Rights and Responsibilities Handbook.

Students Rights and Responsibilities:

Please read the Students Rights and Responsibilities handbook available at:

<http://studentlife.cocc.edu/Resources/Policies/default.aspx>

Americans with Disabilities Statement & Non-Discrimination Statement:

COCC is an affirmative action, equal opportunity institution. Students with documented disabilities who may need special instructional accommodations or who may need special arrangements in the event of an evacuation should notify the instructor as soon as possible, no later than the second week of the term. Students may contact COCC Disability Office in the Boyle Education Center to discuss special needs, 383-7583.

COCC Non-Discrimination Policy:

Central Oregon Community College is an affirmative action, equal opportunity institution. It is the policy of the Central Oregon Community College Board of Directors that there will be no discrimination or harassment on the basis of age, disability, gender, marital status, national origin, race, religion, sexual orientation, or veteran status in any educational programs, activities or employment. Persons having questions about equal opportunity and non-discrimination, please contact Human Resources for referral to the appropriate personnel, 383-7236.

Student Insurance:

Students are not covered by medical insurance while on campus or involved in college classes and activities. Students are responsible for their own medical and dental insurance coverage. Information on student insurance coverage can be obtained in the Student Life office in the Campus Center Building or at the cashier in the Boyle Education Center. If you have specific questions or concerns regarding student insurance, you should discuss them with the Program Coordinator or Department Chairperson.

Course Description: Mth253 introduces additional calculus concepts for Science, Mathematics, and Engineering students. Topics include: parametric and polar functions, infinite sequences, infinite series, Maclaurin and Taylor series and polynomials, vectors and their applications, solving linear systems, determinants of matrices, linear dependence and

independence of vectors, linear transformations, and eigenvalues and eigenvectors. Topic presentation includes group activities, writing assignments and projects to emphasize concepts. Topic presentation will include applications whenever possible. The instructor and student will communicate concepts verbally, analytically, numerically, and/or geometrically (the “Rule of Four”).

Mth 253 has the competencies from Mth 252: Calculus II as prerequisites; the course is college-transferable. Mth 253 is a 4 credit hour (quarter system) course and is the third course in the Calculus sequence

Performance Based Outcomes in Mathematics

Students who successfully complete any mathematics course at Central Oregon Community College will be able to:

1. *Work independently to explore mathematical applications and models, and to develop algebraic/symbolic, graphical, numerical, and narrative skills in solving mathematics problems.*
2. *Work as a member of a group/team on projects or activities that are designed to explore mathematical applications and models.*
3. *Use both written and oral skills to communicate about mathematical concepts, processes, complete mathematical solutions and their implications.*
4. *Use a variety of problem solving tools including symbolic/algebraic notation, graphs, tables, and narratives to identify, analyze, and solve mathematical problems.*
5. *Develop mathematical conjectures and use examples and counterexamples to examine the validity and reasonableness of those conjectures.*
6. *Create and analyze mathematical models of real world and theoretical situations, including the implications and limitations of those models.*
7. *Use appropriate technologies to analyze and solve mathematics problems, and verify the appropriateness and reasonableness of the solution(s).*

Specifically, students who complete Math 253: Calculus III will be able to:

- graph and analyze parametric and polar equations
- apply differential and integral calculus to parametric and polar equations
- work with infinite sequences and series
- determine if an infinite sequence converges or diverges
- use an appropriate test to determine the convergence or divergence of an infinite series, such as the comparison test, ratio and root tests, and alternating series test
- construct and use Maclaurin and Taylor Polynomials to approximate a non-polynomial function
- perform vector and matrix arithmetic
- solve systems of equations using Gaussian elimination and determinants
- find and use matrix inverses
- determine if vectors are linearly independent
- calculate eigenvalues and solve eigenvalue problems
- determine if a transformation is linear.
- write significant mathematics in at least one of the following formats:

Determine the solution or lack of solution to a multiple-step problem and develop the solution in a formal laboratory report. Analyze, discuss in a team, and develop the solution to an open-ended problem and present that solution in the form of a formal technical report.

Also: An absolutely amazing mathematical fact that we will prove (and understand) this term:

$$e^{\pi i} + 1 = 0$$

Disclaimer: *The contents of this syllabus are subject to revision at the discretion of the instructor.*

WEEK:	<u>Very tentative weekly schedule and topics for Math 253 Spring 2017</u>	
First: April 3	Cover the syllabus, which includes how the class is. You must come to class every day this week to remain registered in the class. Read sections 10.1 & 10.2; Parametric Equations, graphs and Calculus with Parametric Equations. HW due dates are posted in class and on (WA). Make sure you are signed up on WA before the next class and in the correct section. Wr-HW1 and WA 10.1 due Friday. Read 10.3 and 10.4 for next week.	
Second: April 10	Polar Coordinates and Areas & Lengths in Polar Coordinates Wr-HW2 due Monday, WA 10.2 due Wed, & Wr-HW3 due Friday. Lab 1 due Fri; From the course pack (CP) read pages 2-8 and 22-29 for next week.	
Third: April 17	Wrap up Ch. 10 and introduce Linear Algebra (see the Course Pack, it's available in the book store or on my directory web page).	
Fourth: April 24	The First Test is scheduled for this week over 10.1-10.4 Continue Linear Algebra	
Fifth: May 1	Continue Linear Algebra	
Sixth: May 8	Continue Linear Algebra	
Seventh: May 15	The Second Test is scheduled for this week over Linear Algebra Ch. 11: Infinite Sequences and Series, 11.1 and 11.2	
Eighth: May 22	Ch. 11: Infinite Sequences and Series, 11.2 - 11.4	
Ninth: May 29	Monday May 29, Memorial Day, Holiday, College Closed	Infinite Sequences and Series, 11.5, 11.6, and 11.8
Tenth: May 30	Cover 11.9 and 11.10 REVIEW for the final.	
Eleventh: June 6	<u>Final:</u> 1:15pm class: Monday, June 12th from 1:00-3:00pm	