

Math 254 / Vector Calculus I / TuTh 10:15-12:20 / CRN 31991 / GRV 110 / Su'17

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| Instructor: Liz Coleman | Office: GRV 214 | Office hours: TuTh 12:25 - 1:00 pm in GRV 110; |
| Phone: 541-383-7414 | | Wed: 1:ish - 3:ish in GRV 214 |
| Email: ecoleman@cocc.edu | Directory Page: http://www.cocc.edu/ecoleman/ | |

Textbook: Calculus Early Transcendentals by James Stewart 8th ed., published by Cengage Learning

You have 2 choices through our COCC bookstore:

1) A “custom” textbook with no HW problems that comes bundled with access to WebAssign (WA) homework and eBook, ISBN: 9781305616691 @ \$172.50, for the lifetime of the edition. If you want to save \$46.75, you can purchase just 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 Calculus last year, with the 8th edition and used WebAssign (WA), 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 this class is: cocc 0578 9662

Using Firefox: check out the WA Quick Start guide: http://www.webassign.net/manual/WA_Student_Quick_Start.pdf

Note for first time users: the first two weeks of access to WA is free! You must have access to WA for this class.

Additional Materials: Graphing Calculator-TI83 or higher recommended, well-organized 3-ring binder, ruler – straight edge, a few colored pencils (or pens), and graph paper, including isometric paper – which can be printed off the internet.

MTH 254 introduces concepts of vector calculus to science, mathematics, and engineering students. Topics include: vectors, vector operations, vector-valued functions, differentiation and integration and their applications to vector-valued functions, functions of several variables partial derivatives, gradients, directional derivatives, and optimization problems. Topic presentation include group activities, writing assignments and projects to emphasize concepts. The instructor and student will communicate concepts verbally, analytically, numerically, and/or geometrically (the “Rule of Four”).

MTH 254 has the competencies from Mth 253: Calculus III as prerequisites (with a C or better); the course is college-transferable. MTH 254 is the first course in the Vector Calculus sequence. We will cover material in chapters 12-14 of the text as well as some material not covered in the text.

Specifically, students who complete Math 254: Vector Calculus I will be able to:

- perform basic vector operations such as addition, subtraction, scalar multiplication, dot and cross products
- understand and use the geometric properties of the basic vector operations
- find the equations of lines, planes, and surfaces in space
- differentiate and integrate vector-valued functions
- find tangent and normal vectors to a curve in space
- find the arc-length and curvature of a curve in space
- differentiate functions of several variables by partial differentiation
- find and apply directional derivatives and the gradient of a function of two or three variables
- use partial derivatives to find tangent planes, normal lines, and extrema of functions of two variables
- use Lagrange Multipliers to solve optimization problems
- use a computer algebra or graphing system (such as Mathematica or Maple) to deepen understanding of vector calculus - we will be using the 3D graphing program at the following link:

<http://web.monroecc.edu/manila/webfiles/pseeburger/CalcPlot3D/>

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. Make sure to ask questions as they come up in class or out of class. I'm very good about checking my email – it is linked to my phone so I can get back to you evenings and weekends.

Pay attention in class, take good notes and actively participate-ask questions!

Do your homework as soon after class as possible, review and fill in your notes. Get help when you are stuck. Check WA for the keys to HW and labs.

Pay attention to feedback on your graded work. Make sure you understand why you got something marked off.

Start reviewing and practicing additional problems for tests at least a week ahead of the test.

Evaluation

Your grade will be determined on your scores from homework, labs, a midterm exam, and the final exam. All written work must be done in pencil, points will be deducted for pen (unless you are using colored pens only to highlight graphs or vectors) and any frills left on binder paper.

HOMEWORK (HW) (20%): Daily homework will be handled electronically through the **WebAssign (WA)** web page and with associated written HW. You will have 10 chances to improve your WA homework score as long as you complete the homework before the due date and associated deadline. There are due dates that are posted on each assignment and in class. You will get 5% bonus for getting your work submitted 24 hours before those due dates. The absolute deadline dates for each WAHW is only one week after the due date with a 25% penalty on work turned in after the due date. To submit WA work after due dates you can request an automatic extension through WA. No WA homework can be submitted after deadline dates.

For the WA HW, do your work neatly on paper, numbering each problem and noting which HW number it comes from. If you ask me (or the tutors) questions about the HW you will need to show me the work you tried.

Written (WR) HW will be handed out in class and will generally be due two class meetings later by 5pm. Late WRHW will only be accepted up to a week late with a 25% penalty. Keys to the WR HW will be posted on the Announcement section of WA.

GROUP LAB PROJECTS (20%): We will have *approximately* 6 labs this quarter. These are group labs with groups of 2-4 students and you will be asked to hand in one lab "write-up" per group. Part of learning math is being able to communicate the concepts. I will be scheduling some class time for each lab so that you can at least get together to compare and discuss your answers. The labs will be graded on neatness, completeness, as well as accuracy, and must be in pencil. **Late labs will be reduced by 25% and accepted only up to a week late. Solo labs will be reduced by 10%.**

MIDTERM (30%): We will have one midterm this summer over chapters 12 and part of 13. It is scheduled for Tuesday of week 6. There will be no make-up exams.

FINAL EXAM (30%): The comprehensive final is scheduled for:

Thursday, August 31st, in GRV 110 or 234, to be determined.

The final covers chapters 12, 13, and most of 14.

- **Remember that mathematics is much more than knowing any particular theorem or formula, or being able to solve any one kind of problem.**
 - Mathematics is about the process of problem solving -- of being able and willing to think about how to solve a problem when it's not clear where you should start.
 - Mathematics is about extending the understanding you have in order to propose and solve different, more interesting, or more difficult problems.
 - Mathematics is also about being able to explain what you've done so that someone else can follow and understand your work.

Other important dates:

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| June 30 | Last day to begin attendance in a new class |
| July 4 | Holiday, no class, college closed |
| July 7, 5pm | Tuition due and last day for full refund |
| Aug 11, 1pm | Last day to drop classes with no grade on transcript |
| Aug 23, 6pm | Last day to withdraw, receive a "W" grade (need instructor's signature) |
| Aug 31 | Finals – last day of class. |

Instructional Methods: Some lecture, small group work, and discussion. *It is highly recommended that you read the assigned section(s) before class.* There is also a WebAssign (on-line computer) component for working on, and turning in, your homework.

Students Rights and Responsibilities: Please read the Students Rights and Responsibilities handbook available at: <http://studentlife.cocc.edu/Resources/Policies/default.aspx> I adhere to Central Oregon Community College's standards as they are discussed in the Student Rights and Responsibilities Handbook. COCC is an affirmative action, equal opportunity institution.

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.

Dropping a Class/Audits: 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 by the end of the Wednesday prior to finals week, you may drop a course and receive a W on your transcript only with permission from your instructor. If you stop coming to class after the first week I cannot drop you from the class and you will receive an F.

| WEEK: | <u>Tentative weekly schedule and topics for Math 254 Summer 2017</u> | |
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| First: June 27 | Cover some key points of the syllabus, which includes how the class is structured. Introduce the 3-dimensional coordinate system and vectors. Read sections 12.1, 12.2 & 12.3. 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. Cover the Dot Product and the Cross Product Hand out Lab #1 on Thursday: due Thurs. of wk 2. WRHWs#1&#2 Due Thurs. wk 1 Read and 12.4 for next week. | |
| Second: July 4 | Holiday - No class Tuesday, campus closed | WRHW#3 due Thurs. wk 2 Group Lab #1- due Thursday. Read 12.5 and 12.6 for next week. |
| Third: July 11 | Cover equations of lines and planes in 3-d & cylinders and quadric surfaces; practice drawing surfaces in 3-d (Be sure to check WA announcements and in-class for due dates from here on out). | |
| Fourth: July 18 | Finish chapter 12 Introduce chapter 13: Vector Functions Read sections 13.1 & 13.2 for this & next week. | |
| Fifth: July 25 | Vector Functions and Space Curves & Derivatives and Integrals of Vector Functions Read 13.3 and 13.4 for next week. | |
| Sixth: Aug 1 | The midterm test is scheduled for Tuesday of this week over chapter 12 and part of chapter 13 material. Arc Length and Curvature & Motion in Space: Velocity and Acceleration | |
| Seventh: Aug 8 | Finish chapter 13 Read sections 14.1, 14.2 & 14.3 for this & next week. (Note: we may not cover all of the chapter 14 material by the end of the term.) | |
| Eighth: Aug 15 | Functions of several variables, Limits and continuity, & Partial derivatives Read sections 14.4, 14.5 & 14.6 for next week. | |
| Ninth: Aug 22 | Tangent planes and linear approximations, The chain rule, & Directional derivatives and the gradient vector Read sections 14.7 & 14.8 for next week. | |
| Tenth: Aug 29 | Maximum and minimum values & Lagrange multipliers | |
| Aug 31 | Comprehensive Final: Thursday, Aug 31st, GRV 110 or 234, TBD | |