| Item #6450 | Math 264 | Multivariable Calculus |
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| Fall 2020 | Zoom Rm: 712 965 5684 | M – F: 10 – 10:50am |

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| **Instructor**: | Dusty Wilson |
| **Office**: | The Corona Cabana (Zoom with Meeting ID: **712 965 5684**) |
| **Phone**: | 206-592-3338 (message only) |
| **Faculty/Office Hours** | Tuesday/Thursday 9 and 11 am and Wed. at 9 am (Zoom Rm: 712 965 5684) |
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**Course Description**: (5 credits) Multivariable calculus. Topics include the calculus of polar functions, sequences, infinite series, double and triple integrals in multiple coordinate systems, line and surface integrals, Green's Theorem, Stokes' Theorem, and the Divergence Theorem.

**Course Objectives**: *The student will be able to …*

- Construct graphs and calculate areas and arclengths for polar curves.
- Apply convergence tests to determine if infinite series converge.
- Construct and evaluate double integrals in the polar coordinate systems.
- Construct and evaluate triple integrals in rectangular, cylindrical, and spherical coordinate systems.
- Construct and evaluate line and surface integrals.
- Apply the Fundamental Theorem of Line Integrals, Green's, Stokes', and the Divergence theorems to evaluate line and surface integrals.
- Determine if vector fields are conservative and independent of path and interpret what this says about vector fields.
- Set up and solve applications, including average value of a function, volumes, areas, centroids, work, and flux.

**Text**: *Calculus* by Stewart

**Prerequisite**: Math 163 with a minimum grade of 2.0.

**Schedule**: We will cover three chapters in this course with weekly assessments. Most sections will be covered in 2 class days. To maintain this pace, I encourage you to read the beginning of each section carefully and skim it in its entirety.

**Calculators**: A graphing calculator is required for this course.

i. The TI-84 is recommended.
ii. Very limited class time will be spent explaining the use of calculators.
iii. Calculators may be rented from the math department on a first come first serve basis.

**Online Homework**: The Assessment (Test) questions will be directly based upon the online homework. So take good notes!. The format and grading criteria for the online homework is as follows.

i. **Enhanced Web Assign:** Graded homework will be administered online thru EWA. The website is: https://www.webassign.net/login.html
**EWA Class Key:** highline.cc.wa 7933 5018 (You can try it out for two weeks).
ii. **Many submissions:** You may make up to five submissions on most problems.

**Online skills checks**: There are a few online skills checks that will be administered through WebAssign.

i. You may attempt each question just once.

ii. You may retake the skills check as many times as you like.
iii. These will be graded as homework assignments.

**Assessments**: There will be (mostly) weekly assessments.
i. Please see below for the details about assessments.
ii. If you miss an assessment, your grade will be replaced with the percent of points scored on the following assessment. Should you miss a second assessment a score of 0 will be assigned. All assessments must be taken during the scheduled class time. *No make-ups.*

**Participation**: 1% of the grade is designated to in class participation. This will include:
i. There are videos/readings every week related to math and calculus or current events. Please respond to the provided questions and submit responses through Gradescope each Friday. After class on Fridays, there will be an *optional* discussion session related to the topic and/or whatever else is on your mind.
ii. Other items such as the Intro Survey due 9/29 that you are to submit through Gradescope.

**Attendance**: 1% of the grade is designated to attendance as follows.
i. Join class on time and put something catchy in the chat (e.g., Dust is on the couch!)
ii. Alternatively, watch the class videos on your own time and submit the completed workalongs via Gradescope by Sunday night. Submit notes in Gradescope to the appropriate "Optional" assignment. The notes cover all days for a given week and do not rollover or accrue attendance points.
- You do not need to submit your notes if you attend class.

**Final Exam**: A comprehensive final exam assessment will be administered in a similar manner to the weekly assessments. The final exam is mandatory and a grade of 0.0 may be assigned at the instructor's discretion to those who fail to take the final exam.

**Early and Late work**: Some items are accepted early … some late.
iii. Early homework (by 24 hours) is given a 5% bonus.
iv. There is a 20% penalty for late homework.
v. Assessments may be submitted (or resubmitted) for a 5% penalty. This option only works within a few hours of the original deadline (see Gradescope for specifics). This is to provide an incentive for attending other presentations.
vi. Participation activities may be submitted (or resubmitted) for a 20% penalty until midnight the day they are due.
vii. Class notes may not be submitted late.

**Grading**: Homework: 15%, Quizzes: 5%, Participation: 1%, Attendance: 1%, Assessments: 50%, and Final Exam: 28%. GPA's will be given according to:

| 95-100% | 4.0 | **%%%** | **GPA** | **%%%** | **GPA** | **%%%** | **GPA** | **%%%** | **GPA** |
|---|---|---|---|---|---|---|---|---|---|
| 94% | 3.9 | 86% | 3.1 | 76-7% | 2.3 | 65% | 1.5 | 57% | 0.7 |
| 93% | 3.8 | 85% | 3.0 | 74-5% | 2.2 | 64% | 1.4 | 0-56% | 0.0 |
| 92% | 3.7 | 84% | 2.9 | 72-3% | 2.1 | 63% | 1.3 | | |
| 91% | 3.6 | 83% | 2.8 | 70-1% | 2.0 | 62% | 1.2 | | |
| 90% | 3.5 | 82% | 2.7 | 69% | 1.9 | 61% | 1.1 | | |
| 89% | 3.4 | 81% | 2.6 | 68% | 1.8 | 60% | 1.0 | | |
| 88% | 3.3 | 80% | 2.5 | 67% | 1.7 | 59% | 0.9 | | |
| 87% | 3.2 | 78-9% | 2.4 | 66% | 1.6 | 58% | 0.8 | | |

**All about Assessments**: These are strange times requiring creativity and flexibility on the part of students and teachers. I want to assess whether you are learning/understanding calculus. I want you to be able to collaborate online with each other (for the sake of community and greater understanding). At the same time, I want to ensure that you are being assessed on the basis of *your* understanding of calculus (and not that of your friend, Chegg, or WolframAlpha).

i. There will be weekly assessments administered as follows:

- Friday by 5 pm:
  - I will post a blank assessment for you to download/print. This will be around 10 questions in length.
  - These are to be worked by hand.
  - Printing (or working on a touch screen) is preferable, but you may work on scratch paper if need be. If you do this, please clearly label your work and work no more than one question per page.
- Saturday by 9 am
  - You will sign up for a five minute Zoom presentation slot on the Google Sheet.
- The weekend:
  - You will have the weekend to work through the assessment questions, collaborate with peers, and utilize online resources.
- Monday:
  - 9 am: You will upload your handwritten solutions to the questions into Gradescope.
  - During the five minute time slot you signed up for, you will meet with your instructor online in Zoom.
  - Using a random number generator, your instructor will assign and then ask you to explain one of your solutions.
    - You are welcome and encouraged to attend the presentations of your classmates.
    - Presentations can be recorded upon request.
    - Time permitting, you may ask about other solutions.

ii. Grading the assessments:

- To receive credit, you must submit your handwritten solutions *and* present online.
- Handwritten solutions and showing up for your time slot: 50%
- Quality of presentation, clarity, and mathematical accuracy: 50%

iii. Expected questions:

- I've never done this, do you have any tips?
  - Relative to a few timed traditional exams, previous students generally liked the presentation format.
  - The questions will be straight off of the homework. So if you take good notes, the Assessments should be straight-forward.
  - Learning to annotate in Zoom is generally helpful.
  - Show lots of work that way you can more easily remember what you did the previous night.
- What if I am not available to present during the time slots?
  - Alternate times are available upon request.
- Will there be any drops?
  - Not as a rule. Please keep me abreast of emergencies and extenuating circumstances.
- What if I don't like to present my work?

- Being able to explain technical work aloud such as mathematics is a vital part of being a successful mathematician, engineer, computer scientist, etc.

- What if there are technical difficulties presenting or uploading my materials?
  - You have all been submitting work electronically for a long time, so I do not expect problems in that area. That said, we can deal with issues as they arise.
  - Presenting requires the same technology as attending class through Zoom.
  - Emergencies will be addressed on a case by case basis
- What if I (or one of my family members) gets really sick and I am unable to keep up?
  - Should it be needed, we will address this on a case by case basis. At the end of the quarter, my desire is that everyone who demonstrates that they have met the course outcomes will pass with flying colors. How we get there remains to be seen.

**Policies and Notes**

i. **Attendance**: You need to attend during the scheduled Assessment times. Lecture attendance is a small part of the grade and you have the option to "attend" on your own time by watching the videos and submitting completed class notes.

ii. **Math Resource Center**: Cost-free mathematics tutoring is available through Zoom and the MRC.

iii. **Faculty Advising**: Highline College instructors are a wonderful resource for students at any stage of the academic process. Many Highline instructors have career experience, are knowledgeable about campus resources, and can assist students in reaching their educational goals through degree planning. If you have an advising question, feel free to approach your instructor. If your instructor cannot answer your question, s/he will help you find someone who can.

iv. **Honors**: Highline College offers opportunities for students to participate in an Honors Program tailored to their pathways. Students who fulfill all Honors Program requirements may become eligible for a scholarship during their final quarter and receive recognition at Highline's commencement ceremony.

I have a really cool honors project developed for this class that, if enough people participate, can help you and help your classmates! The more the merrier. If you are interested, I invite you to pursue an honors project in this class. After completing the project and earning a 3.5 GPA in this course, an "honors" notation will appear on your official Highline transcript.

v. **Academic Dishonesty**: Cheating, plagiarism, and other forms of academic dishonesty are unacceptable at Highline College and may result in lower grades and/or disciplinary action. It is both your right and responsibility to be familiar with the document entitled: Student Rights and Responsibilities code WAC 132I-1210 adopted by the Board of Trustees of Community College District 9 on December 13, 2007. This is available in the counseling center.

vi. **Special Concerns**: If you have any special concerns about this class, please talk to me personally. The more I know about you individually, the more I can help you be successful in this course. If you need course adaptations or accommodations because of disAbility; if you have emergency medical information to share with me; or if you need special arrangements in case the building must be evacuated, please provide me with the Letter of Accommodation you have received from the Office of Access Services.

vii. **Emergency Procedures**: In the event of an emergency, follow your instructor's directions. If you are told to evacuate the building, take your valuables because you may not be allowed to re-enter. Do not leave campus until your instructor or another campus official tells you to do so. If you may need assistance evacuating, notify your instructor today. To prepare yourself for an emergency, review the evacuation map on the last page of

the emergency placard in your classroom and subscribe to HC Alert at https://hctextalerts.highline.edu/).

viii. **Final Exams**: Your completed final exam will not be returned to you. It belongs to the instructor. However, you may (and should) review your final exam by stopping by the instructor's office the next quarter.

ix. **School Policies**:

- The Student Rights and Responsibilities Code: A legal document that describes college expectations, students' rights, and outlines the process for resolving disciplinary matters and Code violations. http://studentservices.highline.edu/srr.php
- The College Catalog: Lots of fine print about grades, deadlines, and resources can be found in the catalog at: http://catalog.highline.edu/

x. **Important Dates (dates should be verified online)**:

- October 2nd: Last Day for 100% Tuition Refund
- October 9th: The last day to drop without incurring a "W"
- October 12th: Priority deadline for Winter Financial Aid
- November 20th: The last day to officially withdraw with a "W"