

Syllabus for Calculus and Analytic Geometry II - Math 226

Spring 2021 Online at UWSP

Instructor

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Basic Course Format: For each section there is an ~15 minute video lecture in Canvas. Then there are homework problems from the text assigned. I will also have a weekly set of homework problems that will be due on Thursday nights at 11:59PM. These will be posted in Canvas as pdf files. About every 3 or 4 weeks, there will be an hour exam with honor-lock proctoring. As for accessing your instructor, I tentatively plan to have one live Zoom meeting each week at 1:00 on Thursdays. I also have virtual office hours as listed below and by appointment. The grading is described in the Syllabus below.

Office Hours

M, T, Th, 10:00 –10:45. I will also be available most days other than at 11:00AM by appointment. Due to COVID, my office hours will be virtual this year and will be held in my virtual room that is open 24-7, but I will only join the room at scheduled office hours and other times by mutual arrangement with students. The virtual room is also open to student-student meetings to discuss homework etc. The link to the room is: <https://us.bbcollab.com/guest/6907413811a44e868ccab5fff794fb33>

Text

Calculus, Early Transcendentals, eighth ed., by James Stewart. I believe the book rental is for the one-variable part of this. The last chapter we will cover will be available as a pdf either in Canvas or by email or at the library near the end of the semester.

Course Content

There are four main components to this course.

- We first develop integration techniques beyond simple substitution: integration by parts, trigonometric substitution, partial fractions, dealing with improper integrals, the use of Computer Algebra Systems and Numerical Methods.
Next we use integration to solve problems of arclength, areas of surfaces of revolution, centers of mass of thin plate objects, probability, and some problems from economics, e.g. consumer surplus.
- Next we discuss parametric and polar representation of curves in the plane and how to obtain tangent lines, compute areas bounded by curves, arc lengths and volumes and surface areas of solids of revolution and conic sections in rectangular and polar form.
- Thirdly we will study infinite sequences and series and convergence tests. We define functions by power series and compute their intervals of convergence, derivatives, antiderivatives and also learn how to obtain power-series representations for most common types of functions.
- Finally we will study the use of differential equations for modeling and solving separable and linear first-order differential equations. We will also begin the study of vector algebra and lines and planes in space as time allows.
- In the text, we'll cover chapters 7-12. A detailed list of topics follows on the next page.

Homework

For each section, I will assign a set of problems from the text. There will also be a hand-in set of problems posted in Canvas that will be due on each week on Thursday by 11:59PM (except for exam weeks). You should attempt all of the assigned problems as well as the hand in packets of problems. The exams will consist primarily of problems just like these. If you have questions on any of these, you can meet me at my virtual office hours or bring them to the once-a-week live Zoom discussion (tentatively set for 1:00PM on Thursdays). Each homework set will count for 25 points towards your final grade. In addition, you will have the option for earning back some 40% of any points lost on each hour exam if you complete all the hand-in

homework for that exam period. To earn these points back, you will need to explain to me how to correctly do problems on which you lost points during office hours.

Exams

There will be four in-class hour-exams given on or near the dates listed in the course schedule on the opposite page. There will also be a two-hour comprehensive final exam.

Policy on Missed Exams:

If a conflict prevents you from taking an exam, you should contact me prior to the exam if possible, and arrange for an early exam. If you miss one exam for less than adequate reason or do poorly, you can substitute the percentage score on your final for any single 100-point component of your course total.

Grades:

The homework will count for a total of 200 points. I'll drop at least the lowest hwk score. The hour-exams are each worth 75 points and the final is worth 150 points. The final letter grades cut-offs will be close to 60, 70, 80, and 90% for grades of F, D, C, B, and A.

Homework	200 pts
Four Hour Exams	300 pts
Final Exam	150 pts
Total	650 pts

Tentative Schedule for the Semester

Week	Sections	Content
Jan 25	Integral Worksheet 7.1, 7.2, 7.3	Preview of the course, Review of Integration of common functions and using substitution. Integration by parts, Trigonometric Integrals, Trig-Substitution.
Feb 1	7.3-7.6	Trig-Substitution, Partial Fractions, Computer Algebra Systems.
Feb 8	7.7,7.8, 8.1,8.2	Numerical Integration, Improper Integrals, Arc-length of function graphs and Areas of surfaces of revolution.
Feb 15	Exam I , 8.3	Exam I and Centroids of thin plate objects by integration
Feb 22	8.4-8.5, 10.1	Applications in Physics, Engineering, Economics and Probability, Parametric Equations for Curves in the plane.
Mar 1	10.2-10.4	Parametric curves and polar coordinates and tangents and areas
Mar 8	10.5, 10.6, Exam II	Conic Sections in rectangular and polar coordinates
Mar 15	11.1-11.3	Sequences, Series and the integral test and estimates of infinite series.
Mar 22-26	Spring Break!!!	
Mar 29	11.4-11.6	Comparison Tests, alternating series, ratio and root tests
Apr. 5	11.7, 11.8 Exam III	Overview of convergence testing, power series and intervals of convergence
Apr. 12	11.9- 11.11	Representing functions as power series, Taylor and Maclaurin Series Application of Taylor Polynomials
Apr. 19	9.1-9.3	Modeling with Diff. Eq., Direction Fields, Euler's Method, separable ODE's
Apr. 26	9.4, 9.5	Population growth problems and linear differential equations.
May 3	Exam IV 12.1-12.3	Vectors in two and three-space and inner or dot product.
May 10	12.4-12.6	Cross Product, Planes and Quadric Surfaces in 3-space.
May 20		Final will be available in Canvas During a 4-hour period some time in exam week (Tentatively at 2:00PM to 6:00PM on May 20.)

If there are any aspects of the course that you find annoying or that you like or would like tweaked, please don't hesitate to let me know.