**Syllabus for Calculus and Analytic Geometry II - MAT 226 5CR**

Fall 2019 11:00 - 11:50 M-F in Room 218

**Instructor**

Paul Martin, Office 087-B(Wausau Branch Main Bldg), Phone 715-261-6272, email pmartin@uwsp.edu .

**Office Hours**

MWF 12:00 –12:50 and at 10:00-10:45 on Tue. & Thur. I am also willing to help when on campus and not teaching or in meetings. You may also call me at 261-6272 with questions. For students at a distance, we will set up a weekly office hour option through Skype or meet in the Online Room with link below: <https://us.bbcollab.com/guest/b13d3105c3f2434a913221a748604841>

**Text**

*Calculus*, *Early Transcendentals,* eighth ed., (7th is ok too) by James Stewart, ISBN 978-1-285-74155-0

Lectures are available ~ 1 hour after class online at: <https://ics.hosted.panopto.com/Panopto/Pages/Sessions/List.aspx?folderID=f7dbb706-b7b7-478c-bfe2-aab6011b7fd0>

I will hand out course materials in class and but will also post them on the course Canvas site. It is expected that you attend all lectures, or watch the streaming videos. For students that are not on campus, I will arrange for quizzes and exams to be delivered locally.

**Course Content**

* 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 arc-length, 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. We also study 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, their derivatives and 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 3-space as time allows.
* In the text, we'll cover chapters 7-12. A detailed list of topics follows on the next page.

**Homework**

Appropriate problems from the text will be assigned as concepts are covered. You should attempt all of these in an organized homework/notes notebook and bring any questions or comments for discussion at the start of the next class. If you have been doing at least 60% or so of the homework problems in your course notebook, you will have the option for earning back some fraction of any points lost on each hour exam. This percentage buyback will depend on the class average for that exam, but will typically be ~40%. To earn these points back, you will need to show me your homework notebook for that exam period and then explain to me how to correctly do all the problems on which you lost points.

**Quizzes**

There will be a quiz or two in the time period prior to each hour exam. These will be closely related to concepts covered in the previous few days’ homework and topics covered during class. Paying attention and doing assigned homework problems should prepare you well for these quizzes.

**Exams**

There will be four in-class hour-exams given on or near the dates listed in the course schedule on the opposite page. The hour-exams will be 40% take-home and 60% in-class. There will also be a two-hour comprehensive final exam. All exams will be closed-book.

**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. In the event that 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 quizzes will count for a total of 50 points. The hour-exams are each worth 100 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.

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| **Quizzes** | **50 pts** |
| **Four Hour Exams** | **400 pts** |
| **Final Exam** | **150 pts** |
| **Total** | **600 pts** |

**Tentative Schedule for the Semester**

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| **Week** | **Sections** | **Content** |
| Sept 3 | 7.1, 7.2 | Preview of the course, Review of Integration of common functions and using substitution, Integration by parts, Trigonometric Integrals. |
| Sept 9 | 7.3, 7.4  | Trig-Substitution, Partial Fractions |
| Sept 16 | 7.5-7.8 | CAS, Approximation Techniques, Improper Integrals. |
| Sept 23 | 8.1,8.2 **Exam I** | Arc-length of function graphs and Areas of surfaces of revolution**,**  |
| Sept 30 | 8.3-8.5 | Applications of integration in Physics and Economics  |
| Oct 7 | 10.1-10.3 | Parametric and Polar Equations for Curves in the plane, Calculus of Parametric Curves and regions. |
| Oct 14 | 10.4-10.6 | Calculus in Polar Coordinates and Conic Sections in $\left(x,y\right) and \left(r,θ\right).$ |
| Oct 21 | **Exam II** 11.1, 11.2 | Infinite Sequences and Infinite Series. |
| Oct 28 | 11.3-11.5 | Integral and Comparison tests for convergence and Alternating Series.. |
| Nov 4 | 11.6-11.8 | Ratio and Root Tests and Power Series  |
| Nov 11 | **Exam III,** 11.9  | Representing functions as power series via $\frac{1}{1-r}=\sum\_{i=0}^{\infty }r^{n}$. |
| Nov 18 | 11.10- 11.11 | Representing functions as power series, Taylor and Maclaurin Series Application of Taylor Polynomials.  |
| Nov 25 | 9.1-9.2 | Modeling with Diff. Eq., Direction Fields, Euler’s Method,. **Thanksgiving on Nov. 28!** |
| Dec 2 | 9.3- 9.4, **Exam IV** | Separable ODE’s, Population growth problems. **Exam IV** |
| Dec 9 | 12.1-12.3, 12.6 | Vectors in two and three-space and dot product and quadric surfaces. |
|  |  | December 13 is last day of classes. |
|  |  | **Final is on December 19 from 2:45-4:45 (For distance students, time to be arranged)** |