CASPER COLLEGE COURSE SYLLABUS

Course: Math 2210 - Calculus III

Semester: Spring 2016

Lecture Hours: 5  Lab Hours: 0  Credit Hours: 5

Class Time: M-F 10:00 – 10:50  Room: PS 214
Instructor: Kendall Jacobs  Office: PS 338
Office Phone: 268-2043  Email: kjacobs@caspercollege.edu

Office Hours:
TTH 9:00-9:50  TTH11:00-11:50  MWF 1:00-1:50
If the above times don't work for you, please feel free to make an appointment or just drop by!

COURSE DESCRIPTION: Multivariable calculus, including series, limits and continuity of functions of several variables, partial differentiation, multiple integration, and an introduction to vector calculus.

STATEMENT OF PREREQUISITES: MATH 2205, Calculus II (C or better)

COURSE GOAL: The goals of this class are to learn how to use the tools of differential and integral calculus in the study of multi-dimensional functions, to practice communicating with precision, and to develop the ability to solve nonstandard problems.

COURSE OUTCOMES: Students should:

1. Be able to use of the three dimensional coordinate system. They should understand how vectors can represented algebraically in this system and the various operations on vectors (dot and cross product, components, etc.). They should also understand how functions and surfaces can be represented using this system.
2. Be able to represent space curves as vector functions and be able to apply differentiation and integration to such curves. They should be able to do application problems involving motion, curvature and arc length.
3. Have a basic understanding of differential Calculus in \( \mathbb{R}^n \). This includes the ability to calculate and interpret partial derivatives, gradient vectors and directional derivatives.
4. Have a basic understanding of integral Calculus in \( \mathbb{R}^n \). This includes the ability to do double and triple integration and use alternative coordinate systems such as polar, cylindrical and spherical coordinates.
5. Be able to solve application problems involving determining extreme values, surface area, volume, physics applications, expected value, and probability.
6. Be able to calculate and interpret partial derivatives, gradient vectors and directional derivatives.
7. Be able to use technology (in particular a computer algebra system) to analyze problems involving multivariate calculus.

Materials needed for the course:

Book: Calculus – Early Transcendentals 2nd Edition by Briggs Cochran and Gillett. If you took Calc II from Casper College last semester, it is the same text. I may supplement with a few open source resources. We will not be using My Math lab.
**Calculator:** A calculator with graphing and programmable capabilities is very useful and one that does symbolic calculations will be advantageous – however, calculator usage may be restricted on exams. Also we will use Mathematica and or Sage so you need a way to store files.

**METHODOLOGY:** Primarily lecture, with some group work, projects, and technology assignments. You will be expected to OWN everything taught in class (whether or not you are present). I recommend that you study with the intent to understand and not just to get by on the test. You will be strongly encouraged to participate in class. I hope you ask LOTS of questions.

Besides contributing to lectures and class discussions, you may be asked to participate in group activities and peer teaching assignments. Proficiency in mathematics requires practice! Consequently, homework assignments will be assigned daily. I will monitor your progress via quizzes, projects, and exams.

**Evaluation Criteria:** Your letter grade will be based on your performance on the following:

- **Exams (approx 80%):**
  Five 100-point exams will be given (including the final). You are required to take exams at the scheduled hours. Under some pre-approved circumstances an exam may be taken early. In the event that an exam is missed, a 200- point cumulative final may be required. All exams and quizzes are cumulative. Calculator usage may be restricted on exams. Some exams may have a take home component involving technology or may include an oral component. The comprehensive final exam is required.

- **HW/Maple Labs /Quiz (approx 20%):**
  I will assign both pencil and paper assignments as well as regular WebWork exercises. In addition to homework, you may also expect frequent short quizzes. **In general, missed quizzes and in class assignments cannot be made up.**

Many of the homework assignments will have a technology component and will require use of Mathematica, Maple, or Sage software, which is available on the college computers in PS 104 and PS 106, and/ or use of a graphing calculator. Assignments requiring technology will be submitted via our Moodle Course Webpage.

You can also expect to present 2-3 problems to the class during the course of the semester. These presentations will be graded.

**Grading Scale:** You are guaranteed a traditional grading scale of 90% + A, 80-89% B, 70-79% C, 60-69% D, 59%-F. But I reserve the right to lower this without notice if I deem it necessary. Class average and participation MAY be taken into consideration for borderline grades.

**Absent/Late Policy:** Students are expected to attend all class sessions and submit work when it is due. In general, quizzes and in-class projects cannot be made up. Late homework is subject to a significant grade reduction. The instructor reserves the right not to accept assignments that are more than a week late. If you are absent for one week or more due to accident, illness, etc., contact the dean of students and explain your reason. In these cases I can make arrangements with you to make up assignments.

**Student Rights and Responsibilities:**
Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

**Chain of Command:** If you have any problems with this class, you should first contact the instructor in order to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take your problem through the appropriate chain of command starting with the department head, then the division chair, and lastly the vice president for academic affairs.
Academic Dishonesty - Cheating & Plagiarism: Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student ADA Accommodations Policy: It is the policy of Casper College to provide appropriate accommodations to any student with a documented disability. If you have a need for accommodation in this course, please make an appointment to see me at your earliest convenience. If you need ADA accommodation you may contact Brent Heuer, Accommodative Services Counselor 307-268-2557.

Course Content: See attached schedule:

Last Day to Change to Audit or Withdraw: April 14, 2016 will be the last day to drop this class. If you are thinking about changing your class status, you must contact me BEFORE this date. You will not be allowed to audit unless you have been attending class on a regular basis.

Help: I recommend you keep up with the class. If you need help, then get it . . . FAST! I will be available to help individuals during my office hours or by appointment. PLEASE don't hesitate to stop by or give me a call. I want you to succeed!

IF YOU ARE HAVING TROUBLE IN THIS CLASS, PLEASE SEE ME AS SOON AS POSSIBLE!!!
# MATH 2210-01 Calculus III

## Spring 2016 TENTATIVE SCHEDULE

**SUBJECT TO CHANGE!**

**Instructor:** Kendall Jacobs

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<th>WEEK</th>
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<td><strong>WEEK ONE</strong>&lt;br&gt;Jan 18-22</td>
<td>Course Introduction&lt;br&gt;Three Dimensional Coordinate Systems - Vectors – Dot Product&lt;br&gt;&lt;b&gt;Jan 18 Martin Luther King Holiday – No Class&lt;/b&gt;</td>
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<td><strong>WEEK TWO</strong>&lt;br&gt;Jan 25-29</td>
<td>Dot Product – Cross Product – Lines and Curves in Space – Parametric Representation</td>
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<td><strong>WEEK THREE</strong>&lt;br&gt;Feb 1 - 5</td>
<td>Calculus of Vector Valued Functions - Vector Differentiation &amp; Integration</td>
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<td><strong>WEEK FOUR</strong>&lt;br&gt;Feb 8-12</td>
<td>Motion in Space - Arc Length &amp; Curvature - Velocity &amp; Acceleration&lt;br&gt;&lt;b&gt;Exam I&lt;/b&gt;</td>
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<td><strong>WEEK FIVE</strong>&lt;br&gt;Feb 15-19</td>
<td>Planes and Surfaces – Level Curves - Parametric Surfaces –&lt;br&gt;&lt;b&gt;Feb 15 Presidents Day Holiday – No Class&lt;/b&gt;</td>
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<td><strong>WEEK SIX</strong>&lt;br&gt;Feb 22-26</td>
<td>Functions of Several Variables - Limits &amp; Continuity</td>
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<td><strong>WEEK SEVEN</strong>&lt;br&gt;Feb 29 – March 4</td>
<td>Partial Differentiation - Tangent Planes and Linear Approximations&lt;br&gt;Chain Rule - Directions Derivatives</td>
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<td><strong>WEEK EIGHT</strong>&lt;br&gt;March 7-11</td>
<td>Gradients- Max Min Problems&lt;br&gt;&lt;b&gt;Exam II&lt;/b&gt;</td>
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<td>March 14-18</td>
<td>Spring Break</td>
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<td><strong>WEEK NINE</strong>&lt;br&gt;March 21-25</td>
<td>Optimization - LaGrange Multipliers&lt;br&gt;Double Integrals over Rectangles - Iterated Integrals - Double Integrals&lt;br&gt;&lt;b&gt;March 25 – Spring Holiday – No Class&lt;/b&gt;</td>
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<td><strong>WEEK TEN</strong>&lt;br&gt;March 28 – April 1</td>
<td>Double integrals in Polar Coordinates - Applications of Double Integrals&lt;br&gt;Surface Area - Triple Integrals &amp; Applications</td>
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<td><strong>WEEK ELEVEN</strong>&lt;br&gt;April 4 - 8</td>
<td>Triple Integrals in Other Coordinates - Change of Variables - Vector Fields&lt;br&gt;&lt;b&gt;April 8 – Advising Day&lt;/b&gt;</td>
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<td><strong>WEEK TWELVE</strong>&lt;br&gt;April 11-15</td>
<td>Line Integrals - Fundamental Thm of Line Integrals&lt;br&gt;&lt;b&gt;Exam III&lt;/b&gt;&lt;br&gt;&lt;b&gt;April 14 - Withdrawal Deadline&lt;/b&gt;</td>
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<td><strong>WEEK THIRTEEN</strong>&lt;br&gt;April 18-22</td>
<td>Line Integrals - Fundamental Thm of Line Integrals</td>
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<td><strong>WEEK FOURTEEN</strong>&lt;br&gt;April 25-29</td>
<td>Green’s Theorem - Curl and Divergence</td>
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<td><strong>WEEK FIFTEEN</strong>&lt;br&gt;May 2 - 6</td>
<td>Surface Integrals - Stokes’ Theorem - Divergence Theorem&lt;br&gt;&lt;b&gt;Exam IV&lt;/b&gt;</td>
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<td><strong>WEEK SIXTEEN</strong>&lt;br&gt;May 9 - 13</td>
<td>Final Exam Week –&lt;br&gt;Comprehensive exam is required</td>
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