Mathematics 2163 – Calculus III, Section 9
Fall 2012

MWF 9:30 am – 10:20 am in CLBN 213

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Office Hours: Monday, Wednesday 4:00 pm – 5:30 pm and by appointment

Textbook: ***Calculus (Early Transendentials)*** by James Stewart, 6th Edition (Custom Edition for Oklahoma State University), Cengage Publishing. – 2008.

Course's Website: *http://www.math.okstate.edu/~atovstolis/calculus3.htm*

Objectives: The course should familiarize students with main concepts and technique of mathematical analysis in several variables. It includes basic notions and methods of vector operations, functions of several variables and vector-valued functions, limits and continuity properties of functions of several variables, partial derivatives. Various types of standard surfaces are also discussed. In addition, several types of multivariate Riemann integrals will be studied. It is double and triple integrals over various domains, surface integrals, as well as line integrals. These instruments are crucial tools in modern mathematics, physics, engineering and technology. Special attention would be paid to applications of the tools considered. Although the course's presentation is provided for $\mathbb{R}^2$ or $\mathbb{R}^3$ vector spaces, the general case of $\mathbb{R}^n$ will also be investigated when appropriate.

Topics Covered. The course covers topics 12 – 16 of the textbook. In addition, some supplemental materials and real-world examples should be given as time permits.

Preliminary Requirements: I expect that the students are familiar with material of Calculus I and II, especially with the following topics:

- Limit of a sequence.
- Limit of a function at a given point or at the infinity.
- Continuity of a function.
- Derivatives (the definition of derivative, derivatives of elementary functions, basic operations with derivatives including the chain rule, higher order derivatives).
- Antiderivative and indefinite integral. Basic operations, integration by parts, changing variables.
- Riemann (definite) integral. The Fundamental Theorem of Calculus and reasons for applying it.
- Power Series (Taylor expansions, Taylor formula, radius of convergence of a power series, differentiation and integration of a power series).

I also expect that the students are able to deal with radicals, solving algebraic, logarithmic and trigonometric equations, etc.
If you have some difficulties with the aforementioned topics, please let me know as soon as possible. We could schedule additional classes for covering this material.

Attendance. Attendance of our classes is mandatory. It is one of the university's requirements.

In addition to the regular classes, I provide **Help Sessions**. Several interesting examples, strategies to solve some problems more efficiently as well as advanced problems and approaches will be considered on these sessions. You also may ask any questions and bring any problems to be considered there. Attendance of these sessions is non-mandatory but **highly recommended** for anybody. The time is: Tuesday/Wednesday, 6:00 – 8:00 pm. The room is to be announced. You may come later and leave earlier; this activity is solely to help you.

On mandatory classes, an attendance list should be filled in each time.

Lecture Notes. The course website will contain Lecture Notes for several sections. I expect that the students will download and read them carefully. They contain general material and several useful examples. The students are recommended to reconstruct the detailed solutions to these examples. I recommend reading the textbook and lecture notes in advance to have much better understanding on the in-class presentations.

Questions: All your questions in class and on the help sessions are highly appreciated. Remember that misunderstanding tends to be collected. So, feel free to interrupt me when you feel such a misunderstanding.

Calculators. Use of calculators will be permitted for doing homework assignments and on exams and quizzes. However, the answer given from the calculator will not be considered as a solution. I expect well-written detailed solutions to all problems on exams and quizzes. The students could borrow a graphic calculator from the Math Department's Front Office (MSCS 401).

Homework. The homework assignments are mandatory. Almost all your homework will require using of WebAssign.net. The assignments are graded electronically. They also have deadline for submissions. I will supply you with a class key that should be used to register for this section. The address of the WebAssign website is https://www.webassign.net/login.html

The registration information for WebAssign is: **okstate 3894 3456**

The information on WebAssign enrollment could be found at

http://www.math.okstate.edu/system/files/files/self-enrollment.pdf .

Running List of Homework Problems. Some problems that require special attention will be published on the course's webpage. They should emphasize an importance of the main notions and methods of the course. As usual, these problems require a bit more effort than usual homework problems graded online. The students are required to write down complete and clear solutions to the running list's problems into a separate notebook. This notebook will be examined periodically and graded selectively.

Exams: There will be three midterm in-class exams:

- Exam 1 (Monday, 09/24/2012)
- Exam 2 (Friday, 10/26/2012)
- Exam 3 (Monday, 11/26/2012)

Before each exam, we will have a special review class that should help to prepare for the exam.
The Final Exam will be provided on the finals week: December 10 – 14, 2012.
The full OSU Academic Calendar could be found at
http://registrar.okstate.edu/index.php?option=com_content&view=article&id=438&Itemid=3.
No make-up midterm or final exams will be given, and only official university excuses will be accepted as reasons for missing an exam (see 'Missed Work' section below).
In addition, several in-class quizzes may be given on selected days. They will be announced in advance.

Grading. The final grade will be calculated as follows:

- Homework Assignments – 100 points
- Quizzes – 50 points
- Running List of Homework Problems – 50 points
- Three Midterm Exams – 100 point each
- Final Exam – 200 points

Thus, **total number of points is 700**. In addition, a **special bonus of 25 points** will be granted to students that missed no more than one regular class and **passed** all three midterm exams and the final exam (with a score of at least 50% of points awarded for an exam). The final grade will be based on the total score:

- "A" – 600+ points
- "B" – 500-599 points
- "C" – 420-499 points
- "D" – 350-419 points
- "F" – 349 or less points.

Some discretion may be used in deciding 'borderline' cases. It will be based on a general understanding shown by any particular student. Please remember that a general understanding of notions and methods of the course and an ability to apply it to solving problems is crucial.

Missed Work:

- A student will be offered reasonable accommodation in the event that he or she misses a major assessment activity for a ***valid and documented reason***.
- Appropriate documentation shall be provided by the student in a timely fashion to support his or her request for accommodation.
- Major assessment activities are those such that a zero on that activity could reasonably be foreseen to impact the student's grade substantially; this category includes, but is not limited to, exams.
- Valid reasons include official University activities, activities associated with military service, illness, family emergencies, mandatory court appearances, and any other events of comparable gravity.
- Reasonable accommodation means that the student will be given the opportunity to earn a grade on the assessment activity that is based on criteria as similar as possible to those used to grade his or hermclassmates. This opportunity should normally be made available in a timely fashion.

Academic Integrity. The following information is stated by the Office of Academic Affairs of the university (see *http://ce.okstate.edu/policies.aspx*):

Oklahoma State University is committed to the maintenance of the highest standards of integrity and ethical conduct of its members. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration on homework or assignments, plagiarism, multiple submission of the same assignment, cheating on examinations, fabricating information, helping another person cheat, having unauthorized advance access to examinations, altering or destroying the work of others, and fraudulently altering academic records) will result in your being sanctioned. Violations may subject you to disciplinary action including the following: completing a substitute examination, quiz, or assignment; receiving a failing grade on an assignment, examination, or course; receiving a notation of a violation of academic integrity on your transcript ("F!"); and being suspended from the University. You have the right to appeal the charge.

For more information, visit the following website http://academicaffairs.okstate.edu/

OSU Syllabus Attachment. For general university's policies and important dates, see the following resource: http://academicaffairs.okstate.edu/faculty-a-staff/48-syllabus-spring

Math 2163 – Calculus III Course Schedule (Section 9; Fall 2012)

Class	Topic No.	Topic	Date	D	W#
1.	12.2	Vectors	08/20/12	M	1
2.	12.3	Dot Product	08/22/12	W	
3.	12.4	Cross Product	08/24/12	F	
4.	12.5	Equations of Lines and Planes	08/27/12	M	2
5.	12.5	Continued	08/29/12	W	
6.	13	Vector Functions and Space Curves. Derivatives and Integrals of Vector Functions	08/31/12	F	
7.	14.1	Functions of Several Variables	09/05/12	W	3

8.	14.1	Continued	09/07/12	F	
9.	14.2	Limits and Continuity	09/10/12	M	4
10.	14.3	Partial Derivatives	09/12/12	W	
11.	14.4	Tangent Planes and Linear Approximations	09/14/12	F	
12.	14.4	Continued	09/17/12	M	5
13.	14.5	The Chain Rule	09/19/12	W	
14.		Review for Exam 1	09/21/12	F	
15.		Exam 1 (12.2-12.5, 13, 14.1-14.5)	09/24/12	M	6
16.	14.6	Directional Derivatives and the Gradient Vector	09/26/12	W	
17.	14.6	Continued	09/28/12	F	
18.	14.7	Maximum and Minimum Values	10/01/12	M	7
19.	14.7	Continued	10/03/12	W	
20.	14.8	Lagrange Multipliers	10/08/12	M	8
21.	15.1	Double Integrals over Rectangles	10/10/12	W	
22.	15.2	Iterated Integrals	10/12/12	F	
23.	12.6	Cylinders and Quadratic Surfaces	10/15/12	M	9
24.	12.6	Continued	10/17/12	W	
25.	15.3	Double Integrals over General Regions	10/19/12	F	
26.	15.3	Continued	10/22/12	M	10
27.		Review for Exam 2	10/24/12	W	
28.		Exam 2 (14.6-14.8, 12.6, 15.1-15.3)	10/26/12	F	
29.	15.4	Double Integrals in Polar Coordinates	10/29/12	M	11
30.	15.4	Continued	10/31/12	W	
31.	15.5	Applications of Double Integrals	11/02/12	F	
32.	15.6	Triple Integrals	11/05/12	M	12
33.	15.6	Continued	11/07/12	W	
34.	15.7	Triple Integrals in Cylindrical Coordinates	11/09/12	F	
35.	15.7/15.8	Triple Integrals in Cylindrical and in Spherical Coordinates	11/12/12	M	13
36.	15.8	Triple Integrals in Spherical Coordinates	11/14/12	W	
37.	15.9	Change of Variables in Multiple Integrals	11/16/12	F	
38.		Review for Exam 3	11/19/12	M	14
39.		Exam 3 (15.4-15.9)	11/26/12	M	15
40.	16.1	Vector Fields	11/28/12	W	
41.	16.2	Line Integrals	11/30/12	F	
42.	16.3	The Fundamental Theorem for Line Integrals	12/03/12	M	16
43.	16.3/16.4	The Fundamental Theorem for Line Integrals / Green's Theorem	12/05/12	W	
44.	16.4	Green's Theorem	12/07/12	F	
45.		Review for Final Exam (Time: TBA)	12/07/12	F	