MATH 265 – 4 Credits
Calculus III- -Sections 7-12

Syllabus / Course Outline\(^1\) – Spring 2015

**Instructor:** Dr. Miriam Castillo-Gil – Office: Carver 386 – Tel: (515) 294-8184
e-mail: miriamc@iastate.edu – Website: http://orion.math.iastate.edu/miriamc/

**Office Hours:** M, W 11:00-11:50 and W 14:10-15:00. In the event you absolutely can not make it to any of my office hours I am available by appointment. The purpose of the office hour is to go over problems you have trouble with, clarify concepts covered in class and discussing grades.

**Lectures:** Lecture will be on MWF @ 10:00-10:50 AM in Carver 0001.

**Recitation Sections:**
With Dr. James Wilson:

- 7: meets Tuesday at 8:00-8:50 am in Carver 0124
- 9: meets Tuesday at 9:00-9:50 am in Carver 0132
- 11: meets Tuesday at 10:00-10:50 am in Carver 0132

**James’ Office Hours:** MWF 9 - 9:50 AM, M-F 1:10-2:00 PM with cancellations announced in http://orion.math.iastate.edu/wilson/. **Office:** 396D Carver Hall
**James’ e-mail:** jawilson@iastate.edu

With Miss Yi (Jacky) Jiang:

- 8: meets Tuesday at 8:00-8:50 am in Carver 0118
- 10: meets Tuesday at 9:00-9:50 am in Carver 0128
- 12: meets Tuesday at 10:00-10:50 am in Carver 0128

**Jacky’s Office Hours:** Tuesday 1-2 p.m. and Thursday 3-4 p.m. **Office:** 485 Carver Hall
**Jacky’s e-mail:** yjiang1@iastate.edu

**Course Text:** *Thomas’ Calculus, Early Transcendentals*, by Weir/Hass. Twelfth Edition. Pearson Publishing. ISBN: 9780321587992. We will cover chapters 12-16 this semester. More precise information about which material will be covered when is available in the course calendar.

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\(^1\)This document is subject to adjustment by the instructors, with notice given to the students.
Learning Outcomes: The objective of this course is to master the materials in chapters 12-16 in the book. A specific list of objectives can be found below. In particular, the final exam will test on some subset of these objectives.

Geometry in Space, Vectors

- Use the parallelogram law to add geometric vectors.
- Resolve geometric vectors into components parallel to coordinate axes.
- Perform the operations of vector addition and scalar multiplication, and interpret them geometrically.
- Use the dot product to calculate magnitude of a vector, angle between vectors, and projection of one vector on another.
- Find and use direction angles and direction cosines of a vector.
- Use parametric equations for plane curves and space curves.
- Use and convert between parametric and symmetric equations for a straight line.
- Find a tangent line at a point on a parametric curve; compute the length of a parametric curve.
- Compute velocity, unit tangent and acceleration vectors along a parametric curve; resolve acceleration into tangential and normal components and compute curvature.
- Use and interpret geometrically the standard equation for a plane.
- Use the cross product; interpret the cross product geometrically and as area of a parallelogram; interpret the vector triple product as volume of a parallelopiped.
- Recognize cylinders and quadric surfaces from their Cartesian equations.
- Use cylindrical and spherical coordinates, and convert among these two and rectangular coordinates.

Derivatives for Functions of Two or More Variables

- Represent a function of two variables as the graph of a surface; sketch level curves.
- Calculate partial derivatives and the gradient.
- Use the gradient to find tangent planes, directional derivatives and linear approximations.
- Interpret the gradient geometrically.
- Use the Chain Rule.
- Find and classify critical points of functions, using the second derivative test.
- Use Lagrange’s method to maximize or minimize a function subject to constraints.
Multiple Integrals

- State the definition of the integral of a function over a rectangle.
- Use iterated integrals to evaluate integrals over planar regions, and to calculate volume.
- Build on elementary integration techniques to evaluate multiple integrals efficiently.
- Set up and evaluate double integrals in polar coordinates.
- Set up and evaluate integrals to compute surface area.
- Set up and evaluate triple integrals in Cartesian coordinates.
- Use double and triple integrals to compute moments, center of mass, and moments of inertia.
- Use cylindrical and spherical coordinates; change coordinates from rectangular to cylindrical or spherical or the reverse.
- Set up and evaluate triple integrals in cylindrical and spherical coordinates.
- Change the order of variables in multiple integrals.
- Carry out change of variables in multiple integrals.

Vector Calculus

- Calculate the curl and divergence of a vector field.
- Set up and evaluate line integrals of scalar functions or vector fields along curves.
- Recognize conservative vector fields, and apply the fundamental theorem for line integrals of conservative vector fields.
- State and apply Green’s Theorem.
- Set up and evaluate surface integrals; compute surface area and the flux of a vector field through a surface.
- Set up and evaluate integrals over parametric surfaces.
- State and apply the Divergence Theorem.
- State and apply Stokes’ Theorem.

Calculators and Other Electronic Devices: You may use any calculator that does not have wireless communication features (such as the TI-89 Titanium). Calculators are permitted on all quizzes and exams; however, the Instructors reserve the right to inspect calculators during quizzes and exams AND answers without procedure will result in considerable loss of points. Other electronic devices, such as laptops, iDevices, etc., may be used during lecture for educational purposes only.
Homework: Homework will be done online with MyLabsPlus in which you will automatically be enrolled (if everything is working properly!). Homework assignments will be due on Fridays before midnight beginning the second week. The last homework assignment is due the last day of classes during Dead Week. The six lowest homework scores will be dropped.

Students should first attempt to complete the homework by themselves before seeking outside help, such as other students and the professor. There is however no penalty for students working together.

Quizzes: Thirteen quizzes will be given in sections on Tuesdays as per the course calendar. The three lowest quiz scores will be dropped.

Requests for makeup quizzes can be made prior to the date that the quiz will occur; any requests after the quiz has occurred will be turned away, with the exception of medical emergencies in this instance be sure to contact your instructors as soon as possible.

Exams: There will be four in-class midterm exams and a final exam for the course. The first midterm will cover sections 12.1-13.3; the second will cover sections 13.4-14.7; the third will cover sections 15.1-16.1; the fourth will cover sections 16.2-16.8; and the final will be comprehensive. Tentative dates for the four exams are as follows: February 4th, March 4th, April 3rd and April 24th. The lowest midterm score will be dropped. The exams are closed books and closed notes.

Exams must be taken during the scheduled times. There will be NO makeup exams with the exception of medical emergencies or university approved absences.

The final exam is departmental (that is, the same exam for all sections of Math 265) and will take place at the time and place assigned by the registrar. Sample final exams are available online in the departmental webpage for Math 265 http://orion.math.iastate.edu/dept/CoursePages/265/.

Grading Policy:
Your grade will be computed as follows:

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<thead>
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<tbody>
<tr>
<td>Online Homework</td>
<td>10%</td>
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<tr>
<td>Quizzes (Best 10 out of a total of 13)</td>
<td>20%</td>
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<tr>
<td>Midterm Exams (Best 3 out of a total of 4)</td>
<td>45%</td>
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<tr>
<td>Final Exam (Cumulative)</td>
<td>25%</td>
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<tr>
<td>Total</td>
<td>100%</td>
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An overall score of 90% or better guarantees at least an A-; 80% or better guarantees at least a B-; 70% or better guarantees at least a C-. These thresholds might be adjusted down at the end of the semester. A 60% is required to obtain a passing grade.

Any issues about grading for the exams and quizzes must be addressed within two weeks of the test date. After that time no score changes will be allowed.

Blackboard: You will be able to follow your grades in Blackboard and you will also find some materials posted.

SI: Supplemental Instruction (SI) will be available for this course. This is one option to develop learning and is not meant to replace attending class, reading the book, or other course assignments. More information is available online: https://apps-dso.sws.iastate.edu/si/course.php?id=837
**Accommodations:**
Please address any special needs or special accommodations with Dr. Castillo-Gil at the beginning of the semester or as soon as you become aware of your needs. Those seeking accommodations based on disabilities should obtain a Student Academic Accommodation Request (SAAR) form from the Disability Resources (DR) office (515-294-6624). DR is located on the main floor of the Student Services Building, Room 1076. *No retroactive accommodations will be provided in this class.*

**Conduct and Academic Dishonesty:**
We expect all students to behave in a respectful manner during lecture, and *you will be asked to leave the lecture if you are being inappropriate and/or disruptive.* For more information, including make up policies, see the *Class Policies* provided by the Department of Mathematics.

**Other Make up Policies:** The first exam/quiz missed for any reason will count as a drop. Students will NOT be given the opportunity to complete old assignments at the end of the semester to improve their grades.

**Extra Credit:** Occasionally there might be a possibility to earn extra credit on the exams and/or quizzes. Extra credit will not be assigned on an individual basis; and most importantly, no extra credit assignments will be available at the end of the semester to improve grades.