Disclaimer: All items on this syllabus are subject to change. The instructor reserves the right to modify it (including the dates of the tests) to meet the needs of the class. Any in-class announcement, verbal or written, is considered official addendum to this syllabus. It is the student responsibility to attend class regularly and to make note of any change.

INSTRUCTOR: Scott Surgent
E-MAIL: surgent@asu.edu
WEB PAGE: math.la.asu.edu/~surgent
OFFICE: ECA-208
PHONE:
OFFICE HOURS: T-Th 11-12, other days by apt.

Prerequisites: MAT 266 or MAT 271 (Calculus II) or its equivalent with a grade C or better.

Textbook: Essential Calculus, Early Transcendentals by James Stewart, Thomson (Brooks/Cole), 2e. If you are on campus, the book is designed for ASU and has a hand on the front cover: ACP Calculus (Custom) ASU Bundle (w/Enh WebAssign Access) (We will not use WebAssign but the price of the text with it is the same as the price without it.)

Calculators: A graphing calculator (e.g. TI84 or Casio CFX-9850GB Plus) is recommended. Calculators will not be allowed for tests or quizzes.

ATTENDANCE: Attendance is mandatory! Your instructor reserves the right to take attendance and to incorporate your attendance as part of your overall grade. For classes that meet two days a week, the maximum number of absences is four. For classes that meet three days a week, the maximum number of absences is six. For classes that meet once a week (recitations), the maximum number of absences is two.

Videos: We will make use of 267 videos on the sites:

- https://vidman.asu.edu/

Cell Phones: Any student who accesses a phone or any internet-capable device during an exam for any reason automatically receives a score of zero on the exam. All such devices must be turned off and put away and made inaccessible during the exam. This includes Smartwatches!

Classroom behavior: Students will be expected to arrive on class on time, to not leave early, nor to be disruptive in any manner. Excessive absences and tardiness, and any behavior that disrupts the learning environment, may lead to sanctions as determined by the instructor. All electronic devices should be turned off and put away for the duration of the class period (Exceptions, such as using a laptop for note-taking, must be cleared with your instructor beforehand). In the worst cases, students may be subject to withdrawal from the class. The procedures for initiating a disruptive behavior withdrawal can be found at http://clas.asu.edu/classroom/disruptive

Threatening behavior will be handled according to the Student Service Manual, SSM 104-02 http://www.asu.edu/aad/manuals/ssm/ssm104-02.html.
### TENTATIVE DATES FOR LECTURES AND EXAMS

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Sections</th>
<th>Test dates and Holydays</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 8, 10</td>
<td>10.1: 3-D Coordinate Systems 10.2 Vectors</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Jan 15, 17</td>
<td>10.3 Dot Product 10.4 Cross Product</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Jan 22, 24</td>
<td>10.5 Equations of Lines &amp; Planes 10.6 Cylinders &amp; Quadric Surfaces 10.7 Vector Functions &amp; Space Curves</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Jan 29, 31</td>
<td>10.8 Arc Length &amp; Curvature 10.9 Motion in Space</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Feb 5, 7</td>
<td>11.1 Functions of Several Variables</td>
<td>Test 1 (Feb 5, 2019)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sections 10.1 – 10.9</td>
</tr>
<tr>
<td>6</td>
<td>Feb 12, 14</td>
<td>11.3 Partial Derivatives 11.4 Tangent Planes &amp; Linear Approximations</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Feb 19, 21</td>
<td>11.5 The Chain Rule, 11.6 Directional Derivatives &amp; The gradient</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Feb 26, 28</td>
<td>11.7 Maximum &amp; minimum values 12.1 Double Integrals over Rectangles</td>
<td>March 4-8, Spring Break</td>
</tr>
<tr>
<td>9</td>
<td>Mar 12, 14</td>
<td>12.2 Double Integrals Over general regions</td>
<td>Oct 9: Fall Break, no class</td>
</tr>
<tr>
<td>10</td>
<td>Mar 19, 21</td>
<td>12.3 Double Integrals in Polar coordinates 12.5 Triple Integrals and Review</td>
<td>Test 2 (Mar 19, 2019)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sections 11.1, 11.3 – 11.7 &amp; 12.1 – 12.3</td>
</tr>
<tr>
<td>11</td>
<td>Mar 26, 28</td>
<td>12.6 Triple Integrals in Cylindrical Coordinates 12.7 Triple Integrals in Spherical Coordinates</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Apr 2, 4</td>
<td>13.1 Vector fields 13.2 Line Integrals</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Apr 9, 11</td>
<td>13.3 The Fund. Theorem for Line Integrals</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Apr 16, 18</td>
<td>13.4 Green’s Theorem 13.5 Curl &amp; Divergence</td>
<td>Test 3 (Apr 16, 2019)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sections 12.5 – 12.7 &amp; 13.1 – 13.4</td>
</tr>
<tr>
<td>15</td>
<td>Apr 22, 24</td>
<td>13.6 Parametric Surfaces &amp; their areas 13.7 Surface Integrals, catch up</td>
<td>Final Exam Review</td>
</tr>
<tr>
<td>16</td>
<td>Apr 30</td>
<td>Final Exam 13.8 Surface Integrals (Cumulative and including 13.5-13.7)</td>
<td>Final Exam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Cumulative and including 13.5-13.7) Room to be announced.</td>
</tr>
</tbody>
</table>

**Course Withdrawal Deadline**  3/31/2019  
**Complete Withdrawal Deadline**  4/26/2019  

Grade Assignment: A: [90,100], B: [80,90), C: [70, 80), D: [60, 70), E: [0,60)
### Important Dates and Point Allocations

<table>
<thead>
<tr>
<th>Test</th>
<th>Covering through</th>
<th>Date</th>
<th>Grade Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sections 10.1 – 10.9</td>
<td>2/5/19 (in class) 50 minutes</td>
<td>3 Tests 50%</td>
</tr>
<tr>
<td>2</td>
<td>Sections 11.1 – 11.7, 12.1 – 12.3</td>
<td>3/19/19 (in class) 50 minutes</td>
<td>Homework (Webwork) 10%</td>
</tr>
<tr>
<td>3</td>
<td>Sections 12.5 – 12.8, 13.1 – 13.4</td>
<td>4/16/19 (in class) 50 minutes</td>
<td>Quizzes/Group Work 15%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>All above plus 13.5 – 13.7</td>
<td>Tuesday April 30 7:10pm-9:00pm, room TBA</td>
<td>Final Exam 25%</td>
</tr>
</tbody>
</table>

The final is comprehensive

**Homework will be assigned on Webwork.** The URL is [http://webwork.asu.edu](http://webwork.asu.edu)

**Webwork:** Homework will be assigned on Webwork. Your instructor may assign written homework as well. Webwork and written homework will count for 15% of your course grade.

**Academic Status Report:** there are two times during the semester when you will be issued an academic status report from your instructor if your class grade is failing at that time.

If you receive a status report, you must act on it. In particular, if the status report says that you are to meet with your instructor in person, come to office hours within one week of receiving the report.

Status reports are not a real-time running tally of your grades in the class and are not updated to reflect grades earned after the report has been issued.

**Catalog Description:** Vector-valued functions of several variables, partial derivatives, multiple integration.

**Course Overview:** We will discuss vectors and analytical geometry in three dimensions; vector-valued functions and curvature; components of acceleration; functions of several variables; limits and continuity in three-space; partial and directional derivatives; gradients, tangent planes, and extrema of functions of two variables; multiple integrals in rectangular, polar, spherical, and cylindrical coordinates; line integrals; applications of multiple integrals to area, volume, moments, centroids, and surface area.

**Piazza Code of Conduct:** Piazza is an online forum site specifically created for math and science courses. It features a clean interface that makes following threads easier, the threads are sortable and searchable, and provides the ability to enter symbolic mathematics. It is a collaborative site in which students are encouraged to post questions and other students are encouraged to offer assistance. The instructor and teaching assistants monitor Piazza regularly, offering feedback whenever necessary.
Piazza is built into every online course shell and is a required aspect of the course. The instructor will also post messages to the class in this site. Thus, it is the student’s responsibility to be properly signed up in Piazza as directed by the instructor.

- All questions related to classwork should be posted to Piazza. Any homework or classwork questions emailed directly to the instructor will not be answered.
- Please include the section number and question number in the header (e.g. Section 11.2, #7).
- Please include a couple lines of your work. You may also photograph your written work and insert the image within the post. Please trim the image size if possible.
- Please be courteous at all times. No vulgar, demeaning, or aggressive language will be tolerated.
- Do not use Piazza to air grievances or to campaign.
- Do not use Piazza for personal messages. Those should be sent by email to the instructor directly.
- Stay on topic. Do not use Piazza for discussions not related to this class.
- You can post anonymously to fellow students, but I can see your name. No changing your name or using avatars.
- Keep a civil and friendly atmosphere. Piazza works best when there are a lot of students willing to engage the forum.
- Please do not expect immediate replies. Instructors usually check the forum daily. In the meantime, other students are encouraged to add feedback and commentary. Instructors may also deliberately stay in the background so as to promote student-led discussions.

Failure to adhere to these requirements may result in your posting privileges being revoked.

**Learning Outcomes:** At the completion of this course, students will be able to, among other things:
- Describe the structure of a 3-D coordinate system.
- Perform vector operations including dot product and cross product.
- Find parametric equations of a line and scalar equation of a plane.
- Identify cylinders and quadric surfaces.
- Find domain, limit, derivative and integral of a vector function, and the tangent line to a space curve.
- Evaluate the arc length of a vector function.
- Solve applied problems involving velocity and acceleration
- Determine the domain and range of two and three variable functions, and interpret contour plots and level surfaces.
- Find partial derivatives and explain their geometrical meaning.
- Find the tangent plane to a surface at a given point.
- Find linear approximations and differentials
- Write out and apply the chain rule.
- Evaluate gradients and directional derivatives
- Determine maximum and minimum values of a two variable function.
- Evaluate double integrals over general regions.
- Convert double integrals from cartesian to polar coordinates and vice versa
- Evaluate triple integrals in Cartesian, cylindrical and spherical coordinates.
- Sketch vector fields
- Evaluate line integrals of scalar functions and line integrals of vector fields.
- Find a potential function for a conservative vector field.
- State and apply the Fundamental theorem for Line Integrals
- State and apply Green's Theorem
- Find curl and divergence of a vector field.
- Find an equation of the tangent plane to a parametric surface at a given point.
- Evaluate the surface area of a parametric surface on a given domain.
- Evaluate surface integrals of scalar functions and surface integrals of vector fields.
COURSE POLICIES

- Students are responsible for assigned material. Students are responsible for material covered in class whether or not it is in the text.
- Working regularly on assigned problems and attending class is essential to success.
- Expect to spend at least 6-10 hours weekly on homework. You are expected to read the text, preferably before the material is covered in class.
- Quizzes are given randomly and frequently reflect material that has recently been discussed in class.
- No late HW will be accepted and no make-up quizzes/in-class activities will be given.
- Make-up exams are at the discretion of the instructor and only in case of documented emergency. In any case, no make-up exams will be given unless the student has notified the instructor before the test is given.
- Messages may be left in my office, at the main office (965-3951) or through email (recommended).

Academic Dishonesty
Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see http://provost.asu.edu/academicintegrity.

Any (parts of) exams, assignments, reports, or solutions to these, from current or previous semesters, posted to any website not affiliated with ASU will result in academic integrity disciplinary actions against the students posting them and the students using them.

Departmental and University Policies and Procedures

Instructor-Initiated Drop: At the instructor's discretion, any student who has not attended class during the first week of classes may be administratively dropped from the course. However, students should be aware that non-attendance would NOT automatically result in being dropped from the course. Thus, a student should not assume they are no longer registered for a course simply because they did not attend class during the first week. It is the student's responsibility to be aware of their registration status.

Final Exam Make-up Policy: The final exam schedule listed in the Schedule of Classes will be strictly followed. Exceptions to the schedule and requests for make-up examinations can be granted only by the Department Chair, Associate Department Chair or the Director of First Year Mathematics, and for one of the following reasons:
1. Religious conflict (e.g., the student celebrates the Sabbath on Saturday)
2. The student has more than three exams scheduled on the same day as the math final
3. There is a time conflict between the math final and another final exam.

Incomplete: If there is a last-minute personal or medical emergency, the student may receive a grade of Incomplete and make up the final within one calendar year. The student must provide written documentation and be passing the class at the time to receive an Incomplete. Make-up exams will NOT be given for reasons of a non-refundable airline tickets, vacation plans, work schedules, weddings, family reunions, and other such activities. Students should consult the final exam schedule before making end-of-semester travel plans. The Dean of the student's college must approve any exceptions to these rules.

Academic Integrity: Academic honesty is expected of all students in all assignments, examinations, papers, laboratory work, academic transactions and records. Academic dishonesty, including inappropriate collaboration, will not be tolerated. There are severe sanctions for cheating, plagiarism, and any other form of dishonesty. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see

http://provost.asu.edu/academicintegrity
and
https://provost.asu.edu/sites/default/files/AcademicIntegrityPolicyPDF.pdf
Students with Disabilities
Disability Accommodations: Qualified students with disabilities who will require disability accommodations in this class are encouraged to make their requests to me at the beginning of the semester either during office hours or by appointment. Note: Prior to receiving disability accommodations, verification of eligibility from the Disability Resource Center (DRC) is required. Disability information is confidential.

Establishing Eligibility for Disability Accommodations
Students who feel they will need disability accommodations in this class but have not registered with the Disability Resource Center (DRC) should contact DRC immediately. Their office is located on the first floor of the Matthews Center Building. DRC staff can also be reached at: 480-965-1234 (V), 480-965-9000 (TTY). For additional information, visit: www.asu.edu/studentaffairs/ed/drc. Their hours are 8:00 AM to 5:00 PM, Monday through Friday.

Title IX and Discrimination: Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling, is available if you wish discuss any concerns confidentially and privately.

The School of Mathematical and Statistical Sciences encourages faculty to address and refer to students by their preferred name and gender pronoun. If your preferred name is different than what appears on the class roster, or you would like to be addressed using a specific pronoun, please let your instructor know.

The grade of XE: A grade of XE is reserved for "failure for academic dishonesty." The grade goes on the student's transcript; the student needs to petition to have it removed after 1 year.

NOTE:
- The instructor reserves the right to modify it (including the dates of the tests) to meet the needs of the class. It is the student responsibility to attend class regularly and to make note of any change.
- It is a student’s responsibility to verify that they have in fact withdrawn from a class.
- Please schedule an appointment to see me during office hours if you have a disability that will require accommodations in this class.
- To qualify for disability accommodations at ASU, students must qualify for services through the Disability Resource Center (DRC), which is located on the 1st floor of the Matthews Center Building. 480.965.1234 (V), 480.965.9000 (TTY). Please complete this process as soon as possible.

Policy on Threatening Behavior
All incidents and allegations of violent or threatening conduct by an ASU student (whether on-or off campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students. If either office determines that the behavior poses or has posed a serious threat to personal safety or to the welfare of the campus, the student will not be permitted to return to campus or reside in any ASU residence hall until an appropriate threat assessment has been completed and, if necessary, conditions for return are imposed. ASU PD, the Office of the Dean of Students, and other appropriate offices will coordinate the assessment in light of the relevant circumstances.

Classroom behavior:
Students will be expected to arrive on class on time, to not leave early, nor to be disruptive in any manner. Excessive absences and tardiness, and any behavior that disrupts the learning environment, may lead to sanctions as determined by the instructor. All electronic devices should be turned off and put away for the duration of the class period (Exceptions, such as using a laptop for note-taking, must be cleared with your instructor beforehand). In the worst cases, students may
be subject to withdrawal from the class. The procedures for initiating a disruptive behavior withdrawal can be found at http://clas.asu.edu/classroom/disruptive

**Absences related to religious observances/practices:** If you will be absent from class due to a religious observance or practice, it is your responsibility to inform the instructor as soon as possible. Your instructor will work with you on alternative and reasonable arrangements for any time missed.

**Absences related to university sanctioned events and activities:** If you will be absent from class due to participation in a university sanctioned event/activity, it is your responsibility to inform the instructor as soon as possible. Your instructor will work with you on alternative and reasonable arrangements for any time missed.

**Tutoring** is available at the **Math Tutor Center in WXLR 116** and at the **Engineering Tutor Center, ECF 102.** The math tutoring center located in WXLR 116 is open for tutoring throughout the week. Their hours of operation are:
- Monday-Thursday from 8:00 AM until 8:00 PM
- Fridays from 8:00 AM until 3:00 PM
- Sundays from 1:00 PM until 6:00 PM.

The **ASU Math Community Center** in WXLR 303 is an excellent place to get help for the class. The MCC web page is https://math.asu.edu/resources/math-community-center

Online tutoring: https://studentsuccess.asu.edu/onlinetutoring.

Many residence halls and the Memorial Union also offer evening or weekend free tutoring to all ASU students as part of the **Student Success Centers.**

**ASU Learning Resource Center (LRC):** The **LRC, http://asu.edu/lrc** provides counseling, tutoring in math (and many other subjects), supplemental instruction, and other types of support to students. LRC resources are available in many residence halls and in the Memorial Union, Room 14. See the LRC web page for further information.