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.

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. Graphing calculators which perform symbolic manipulation (e.g. TI89, TI92, Casio FX2 or 9970G) 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/](https://vidman.asu.edu/)
- [https://math.la.asu.edu/~surgent/video/mat267_exp.html](https://math.la.asu.edu/~surgent/video/mat267_exp.html)

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](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](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>
</table>
| 1    | 1/8 - 1/12  | 10.1: 3-D Coordinate Systems  
10.2 Vectors                      |                                    |
| 2    | 1/15 - 1/19 | 10.3 Dot Product  
10.4 Cross Product                 | 1/15/2018 Martin Luther King Day  
(no class)                          |
| 3    | 1/22 - 1/26 | 10.5 Equations of Lines & Planes  
10.6 Cylinders & Quadric Surfaces  
10.7 Vector Functions & Space Curves |                                    |
| 4    | 1/29 - 2/2  | 10.8 Arc Length & Curvature  
10.9 Motion in Space                 |                                    |
| 5    | 2/5 – 2/9   | 11.1 Functions of Several Variables                                    | Test 1 (2/8/2018)  
Sections 10.1 – 10.9 |
| 6    | 2/12 – 2/16 | 11.3 Partial Derivatives  
11.4 Tangent Planes & Linear Approximations                                |                                    |
| 7    | 2/19 – 2/23 | 11.5 The Chain Rule,  
11.6 Directional Derivatives & The gradient                                 |                                    |
| 8    | 2/26 – 3/2  | 11.7 Maximum & minimum values  
12.1 Double Integrals over Rectangles                                       |                                    |
| 9    | 3/4 – 3/10  | Spring Break – No Classes                                                |                                    |
| 10   | 3/12 – 3/16 | 12.2 Double Integrals Over general regions  
12.3 Double Integrals in Polar coordinates                                 |                                    |
Sections 11.1, 11.3 – 11.7 & 12.1 – 12.3 |
| 12   | 3/26-3/30   | 12.6 Triple Integrals in Cylindrical Coordinates  
12.7 Triple Integrals in Spherical Coordinates  
13.1 Vector fields                  |                                    |
| 13   | 4/2 – 4/6   | 13.2 Line Integrals  
13.3 The Fund. Theorem for Line Integrals                                 |                                    |
| 14   | 4/9 – 4/13  | 13.4 Green’s Theorem  
13.5 Curl & Divergence                                                       |                                    |
| 15   | 4/16- 4/20  | 13.6 Parametric Surfaces & their areas                                   | Test 3 (4/19/2018)  
Sections 12.5 – 12.7 & 13.1 – 13.4 |
| 16   | 4/23 – 4/27 | 13.7 Surface Integrals                                                   | Final Exam Review                  |
| 17   | Tuesday 5/1/2018 7:10-9:00PM | Final Exam  
(Cumulative and including 13.5-13.7)                              | Final Exam  
(Cumulative and including 13.5-13.7)  
Room to be announced. |

**Course Withdrawal Deadline**  
4/1/2018  
**Complete Withdrawal Deadline**  
4/27/2018
**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>2/8/2018 (in class) 50 minutes</td>
<td>3 Tests 50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Homework (Webwork) 15%</td>
</tr>
<tr>
<td>2</td>
<td>Sections 11.1 – 11.7, 12.1 – 12.3</td>
<td>3/22/2018 (in class) 50 minutes</td>
<td>Quizzes/Group Work 10%</td>
</tr>
<tr>
<td>3</td>
<td>Sections 12.5 – 12.8, 13.1 – 13.4</td>
<td>4/19/2018 (in class) 50 minutes</td>
<td>Final Exam 25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>All above plus 13.5 – 13.7</td>
<td>Tuesday May 1st 7:10pm-9:00pm, room TBA</td>
<td></td>
</tr>
</tbody>
</table>

**Exams Policies**
Your calculator memory may be randomly viewed during any exam and will be cleared if anything suspicious is written therein. The Instructor has the right to regard finding suspicious material in your calculator memory as cheating. Makeup exams are given at the discretion of the instructor and only in the case of verified medical or other emergency, which must be documented. The instructor must be notified before the test is given. Call the instructor or the Math Department Office (480-965-3951) and leave a message or directly notify your instructor.

**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.

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](http://provost.asu.edu/academicintegrity).

**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](http://provost.asu.edu/academicintegrity) and [https://provost.asu.edu/sites/default/files/AcademicIntegrityPolicyPDF.pdf](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](http://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 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](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](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.