

**Applied Calculus III  
AMS 261  
Spring 2018**

**Instructor: Dr. Kazem Mahdavi, Professor of Mathematics**  
**Office: Academic Building A 511**  
**Office Hours: TTh 3:00 – 5:00 pm, or by appointment**  
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**Class Meeting Time: MW 10:30-11:50 am (lec), and Fr 1:30-2:23 pm (rec)**  
**Room: lecture B203, recitation B203**

**TA: Sai Gayatri Pra Peri, office hours TTh 5:00-7:00pm**

**Required Texts:**

Multivariable Calculus, by Ron Larson, and Bruce Edwards, 10<sup>th</sup> Edition,  
Brooks/Cole publisher

**Course Description:** this is a 4 credit hours course. The topics covered will include vector algebra and analytic geometry in two and three dimensions; multivariable differential calculus and tangent planes; multivariable integral calculus; optimization and Lagrange multipliers; vector calculus including Greens and Stokes' theorems.

**Prerequisite:** AMS 161

**Evaluation Methods**

Quiz/homework	50 points
Test 1	100 points
Test 2	100 points
Final	150 points

**Notice:** to get a passing grade

1. your final exam score should be at least 105 (70%).
2. Also, student should attend class regularly. See the university attendance policy at

the end of this document.

## **HOMEWORK**

You will have weekly homework. In order to learn the course materials and develop necessary skills, you should do your homework on time. No late homework will be accepted. I strongly encourage students to form a study group to do their homework.

## **Attendance**

Attending this class is compulsory. Regular attendance is very important and is a factor in helping students to succeed in the course. You may fail the course if you do not attend the class regularly. See the university attendance policy at the end of this document.

## **Test and Quiz Dates (Tentative):**

Quiz might be given without prior announcement

Test 1 will be in April

Test 2 will be in May

Final: Monday June 18, 9:00-11:30 am

## **Grades**

93%-100%	A
90%-92%	A-
87%-89%	B+
83%-86%	B
80%-82%	B-
77%-79%	C+
73%-76%	C
70%-72%	C-
67%-69%	D+
63%-66%	D
60%-62%	D-
0%- 59%	F

## **Topics covered:**

1. Vector algebra and analytic geometry in two and three dimensions
2. Multivariate Differential Calculus- partial derivatives and gradients, tangent planes
3. Multivariate Integral Calculus: double and triple integrals, change of variables and Jacobians, polar coordinates, applications to probability
4. Optimization: maxima and minima, Lagrange multipliers
5. Vector Calculus: vector-valued functions, curves in space, linear integrals, surface integrals, Green's Theorem, Stoke's Theorem

## **Learning Outcomes for AMS 261, Applied Calculus III**

1.) Demonstrate a firm understanding of the vector algebra and the geometry of two- and three-dimensional space. Specifically, students should be able to:

- \* explain and apply both the geometric and algebraic properties of vectors in two and three dimensions.
- \* compute dot and cross products, and explain their geometric meaning.
- \* sketch and interpret vector-valued functions in two and three dimensions.
- \* differentiate and integrate vector-valued functions.
- \* explain and apply polar, cylindrical and spherical coordinate systems.

2.) Demonstrate an understanding of scalar functions in several dimensions, and the application of differential and integral calculus to multi-variable functions.

Specifically students should be able to:

- \* describe and sketch curves and surfaces in three-dimensional space.
- \* compute the partial derivatives of multi-variable functions.
- \* compute and explain directional derivatives and gradients.
- \* determine the extreme values of multiple variable functions.
- \* use Lagrange multipliers to solve constrained optimization problems.
- \* solve double- and triple-integrals using iterated integration.
- \* set up double- and triple-integrations problems in both Cartesian and curvilinear coordinate systems.
- \* explain and apply the use of Jacobians in solving double- and triple-integrals by coordinate substitution.

3.) Demonstrate a understanding of the fundamental concepts of vector algebra and vector calculus; specifically students should be able to:

- \* describe and sketch vector fields in two and three dimensions.
- \* compute and interpret line and surface integrals through scalar or vector fields.
- \* explain and apply Green's Theorem.
- \* explain and apply the Divergence Theorem.
- \* explain and apply Stokes' Theorem.

4.) Strengthen ability in communicating and translating of mathematical concepts, models to real world settings:

- \* present solutions to problems in a clear, well-laid out fashion;

- \* explain key concepts from the class in written English;
- \* convert problems described in written English into an appropriate mathematical form;
- \* convert the mathematical solutions into a written answer.
- \* use the maple computer program as an aid in solving and visualizing mathematical problems.

### **Cell phones, IPODs and other electronic devices use are not allowed**

Please set your cell phones and pagers to silent mode, and turn off all your electronic devices during the class time. If you are expecting an emergency call, please notify the professor in advance, sit near the door, and answer the phone outside. You will not be allowed to wear an IPOD or other electronic devices during an exam.

### **Photography and recording is prohibited during the class.**

### **Policies and Expectations**

Please refer to the following link in terms of Policies and Expectations of the students. <http://admissions.sunykorea.ac.kr/academics/29>

### **Academic Integrity**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

### **Americans With Disabilities Act**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Academic Affairs. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

### **Critical Incident Management**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

### **Course Evaluations**

Stony Brook University values student feedback in maintaining the high quality education it provides and is committed to the course evaluation process, which

includes a mid-semester assessment as well as an end-of the-semester assessment, giving students a chance to provide information and feedback to an instructor which allows for development and improvement of courses. Please click the the following link to access the course evaluation system:

<http://stonybrook.campuslabs.com/courseeval/>

### **Attendance Policy of SUNY Korea**

- (1) All students of SUNY Korea are required to attend every class.
- (2) Unexcused absences will affect seriously the student's final grade in the course.
- (3) If a student has over 20% unexcused absence, the student's final course grade will be an 'F'.

Example)

- i) If the class is a 150 minute class, and is held once a week, the 4<sup>th</sup> unexcused absence of a student will lead to an F grade of the course.
  - ii) If the class is a 75 minute class, and is held twice a week, the 7<sup>th</sup> unexcused absence of a student will lead to an F grade of the course.
  - iii) If the class is a 50 minute class, and is held three times a week, the 10<sup>th</sup> unexcused absence of a student will lead to an F grade of the course.
  - iv) In Intensive English Course (IEC), if a student misses the class more than 40 hours in a semester, the student will receive an F grade on the course.
- (4) Students should report the reason of absence to the instructor in advance, or immediately after the absence.
  - (5) When a student excuses his/her absence, the student must provide documentation of the reason for the absence to the instructor.
  - (6) The instructor of the course reserves the right to excuse absences.
  - (7) The course instructor may excuse the absence if the submitted documentation fulfills the conditions below.
    - i) Extreme emergencies (e.g. death in the family)
    - ii) Severe medical reasons with doctor's note (Not a slight illness)
    - iii) Very important events (e.g. national conference, official school event)
  - (8) At the end of semester, the course instructor should submit a copy of the attendance sheet to the Academic Affairs Office.

I have shared the link. FYI, retake policy is now changed

([http://sb.cc.stonybrook.edu/bulletin/current/policiesandregulations/records\\_registration/multiple\\_registrations.php](http://sb.cc.stonybrook.edu/bulletin/current/policiesandregulations/records_registration/multiple_registrations.php)).