

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>NEW COURSE PROPOSAL</b> <b>Undergraduate Programs</b>		UUPC Approval <u>3-29-21</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	<b>Department</b> Mathematical Sciences  <b>College</b> C.E. Schmidt College of Science <i>(To obtain a course number, contact erudolph@fau.edu)</i>		
<b>Prefix</b> MAS  <b>Number</b> 3156	<i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i>  <b>Lab Code</b>	<b>Type of Course</b> Lecture	<b>Course Title</b> Vector Calculus
<b>Credits</b> <i>(Review Provost Memorandum)</i>  3	<b>Grading</b> <i>(Select One Option)</i>  <b>Regular</b> <input checked="" type="radio"/> <b>Pass/Fail</b> <input type="radio"/> <b>Sat/UnSat</b> <input type="radio"/>	<b>Course Description</b> <i>(Syllabus must be attached; Syllabus Checklist recommended; see Guidelines)</i> Implicit and Inverse Function Theorems. Vectors and Vector Fields in Space: Divergence and Curl. Green's, Stokes' and Gauss' Theorems. Introduction to Tensors. Applications.	
<b>Effective Date</b> <i>(TERM &amp; YEAR)</i>  Fall 2021	<b>Prerequisites, with minimum grade *</b>  MAS 2103, min. grade of C; MAC 2313, min. grade of C		<b>Corequisites</b>  NA
		<b>Registration Controls</b> <i>(Major, College, Level)</i>  NA	
<b>*Default minimum passing grade is D-. Prereqs., Coreqs. &amp; Reg. Controls are enforced for all sections of course</b>			
<b>WAC/Gordon Rule Course</b>  <input type="radio"/> Yes <input checked="" type="radio"/> No  <i>WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to proposal. See WAC Guidelines.</i>		<b>Intellectual Foundations Program (General Education) Requirement</b> <i>(Select One Option)</i>  None  <i>General Education criteria must be indicated in the syllabus and approval attached to the proposal. See GE Guidelines.</i>	
<b>Minimum qualifications to teach course</b> Ph.D. in Mathematics or a related discipline.			
<b>Faculty Contact/Email/Phone</b> T. Schonbek/schonbek@fau.edu		<b>List/Attach comments from departments affected by new course</b>	
<b>Approved by</b> Department Chair <u>Stephen Locke</u> College Curriculum Chair <u>Jerry Haky</u> College Dean <u>[Signature]</u> UUPC Chair <u>Jerry Haky</u> Undergraduate Studies Dean <u>Edward Pratt</u> UFS President _____ Provost _____		<b>Date</b> <u>March 10/2021</u> <u>3-18-21</u> <u>3/29/2021</u> <u>3-29-21</u> <u>3-29-21</u> _____ _____	

Email this form and syllabus to [mjenning@fau.edu](mailto:mjenning@fau.edu) seven business days before the UUPC meeting.

# Syllabus

## 1. Course Information

Course Name: Vector Calculus

Course Number: MAS 3156

Number of Credits: 3

## 2. Course Prerequisites

MAS 2103, MAC 2313, with minimum grade of C

## 3. Course Logistics

a. Term - Fall 2021

b. Class location and time: TBA

## 4. Instructor

Name: Tomas Schonbek, Office SE 282

Phone: (561) 297-3355, fax (561) 297-2436

E-mail: schonbek@fau.edu

## 5. Course Description

Vectors and Vector Fields in Space: Divergence and Curl. Green's, Stokes' and Gauss' Theorems. Introduction to Tensors. Applications.

## 6. Course Objectives

Students will be exposed to some basic concepts of mathematics that play a fundamental role in the application of mathematics to physics and engineering. Upon successful completion of the course students will be able to:

- Have a deeper understanding of multivariable calculus.
- Work with line and surface integrals.
- Understand scalar and vector fields, conservative vector fields, and their applications to physics.
- Work with the gradient of a scalar field, the curl and divergence of a vector field and understand the physical meaning of these concepts.
- Have a good knowledge of the divergence and Stokes' theorems and their implications for physics, especially electromagnetism and fluid dynamics.

## 7. Exams and Assignments/Course Evaluation Method

There will be homework, three in class exams, and one comprehensive final exam on the scheduled date. Homework will be assigned frequently and should be handed in on the due dates. Late assignments will not be accepted. Each one of the in class exams is worth 20% of the grade, the final exam is 30% of the grade, homework accounts for 10% of the grade.

## 8. Course Grading Scale

Cumulative Performance	Grade
90%–100%	A
88%–89%	A-
85%–87%	B+
80%–84%	B
78%–79%	B-
75%–77%	C+
70%–74%	C
65%–69%	C-
60%–64%	D
0%–59%	F

## 9. Policy on Makeup Tests, Late work, and Incompletes

Make-up exams will be given only under exceptional circumstance, and written, verifiable excuses must be provided in advance of the scheduled exams. No late work will be accepted. Grades of Incomplete ("I") are reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances. A grade of "I" will only be given under certain conditions and in accordance with the academic policies and regulations put forward in FAU's University Catalog. The student must show exceptional circumstances why requirements cannot be met. A request for an incomplete grade has to be made in writing with supporting documentation, where appropriate.

## 10. Classroom Etiquette Policy

University policy on the use of electronic devices states: "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions."

## 11. Disability Policy Statement

In compliance with the Americans with Disabilities Act (ADA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Service (SAS) —in Boca Raton, SU 133 (561-297-3880); in Davie, LA 203 (954-236-1222); or in Jupiter, SR 110 (561-799-8585)—and follow all SAS procedures.

## 12. Honor Code Policy Statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at [http://www.fau.edu/ctl/4.001\\_Code\\_of\\_Academic\\_Integrity.pdf](http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf)

## 13. Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

## 14. Required Texts/Readings

Vector Calculus, by P.C. Matthews, Springer Undergraduate Mathematics Series, Springer Verlag, 1998.

## 15. Tentative Weekly Schedule

Week	Topics
1	Vector Algebra in 3-space.
2	Dot and Cross Products; Scalar and Vector Fields.
3	Line Integrals and Green's Theorem.
4	Work done against a Force; Conservative Vector Fields.
5	Surface Integrals.
6	Partial Derivatives. Taylor's Theorem in Several Variables.
7	Gradient of a scalar field; Conservative Fields and Potentials.
8	Divergence of a Vector Field. The Laplacian. Applications.
9	Curl of a Vector Field. Physical Interpretation of the Curl. Applications.
10	The Divergence Theorem.
11	Applications of the Divergence Theorem.
12	Stokes' Theorem.
13	Applications of Stokes' Theorem.
14	Gradient, Divergence and Curl in Curvilinear Coordinates.

