Figure 1: Owens Logo.

Course Syllabus
SEMESTER
School of Science, Technology, Engineering, and Mathematics

Course Name:	Calculus III
Course & Section Number:	233-XXX
Meeting Day(s) & Time(s):	
Credits:	4
Contact Hours:	4
Text:	OpenStax Calculus Volume 3
Instructor's Name:	
Office Hours & Location:	
OCC Phone:	
OCC Email:**	

**Please use only Owens email for course communications.

Catalog Description:

This course explores vector-valued functions, motion in space, functions of two or more variables and their derivatives, multiple integrals and integration in vector fields; Green's, Stokes', and the Divergence Theorems are covered with applications.

Prerequisite/Corequisites:

MTH 232 (Calculus II)

Course Materials:

The textbook is Calculus Volume 3, available for free online at https://openstax.org/details/books/calculus-volume-2. You can also order a print copy on the site.

A scientific or graphing calculator such as a TI 84 is required. Graphing calculators with CAS capabilities are not permitted.

Student Learning Outcomes:

Upon the completion of this course the student should be able to:

1. Perform and apply vector operations, including the dot and cross product of vectors, in the plane and space. Graph and find equations of lines, planes, cylinders and quadric surfaces.
2. Differentiate and integrate vector-valued functions. For a position vector function of time, interpret these as velocity and acceleration.
3. Evaluate limits and determine the continuity and differentiability of functions of several variables.
4. Describe graphs, level curves, and level surfaces of functions of several variables.
5. Find arc length and curvature of space curves, including the use of unit tangents and unit normals; identify and interpret tangential and normal components of acceleration.
6. Find partial derivatives, directional derivatives, and gradients and use them to solve applied problems.
7. Find differentials of functions of several variables and use them to solve applied problems. (optional)
8. Find equations of tangent planes and normal lines to surfaces that are given implicitly or parametrically.
9. Use the chain rule for functions of several variables (including implicit differentiation).
10. For functions of several variables, find critical points using first partials and interpret them as relative extrema/saddle points using the second partials test. Find absolute extrema on a closed region. Apply these techniques to optimization problems.
11. Use Lagrange multipliers to solve constrained optimization problems. (optional)
12. Evaluate multiple integrals in appropriate coordinate systems such as rectangular, polar, cylindrical, and spherical coordinates and apply them to solve problems involving volume, surface area, density, moments, and centroids.
13. Use Jacobians to change variables in multiple integrals. (optional)
14. Evaluate line and surface integrals. Identify when a line integral is independent of path and use the Fundamental Theorem of Line Integrals to solve applied problems.
15. Identify conservative and inverse square fields.
16. Find the curl and divergence of a vector field, the work done on an object moving in a vector field, and the flux of a field through a surface. Use these ideas to solve applied problems.
17. Introduce and use Green's Theorem, the Divergence Theorem, and Stokes' Theorem.

Disability Services Resource Center: If you have a disability or acquire one, you may be entitled to receive reasonable accommodation intended to assure you an equal opportunity to participate in and benefit from the program. To receive more information or to register for accommodations, please contact the Disability Resource Center in College Hall 116 at 567-661-7007 or email https://www.owens.edu/disability/

Tutoring Services: Toledo-area Campus: Learning Commons College Hall Room 173 (Enter Library CH170 and turn right). Findlay-area Campus: Education Center Room 149Both centers offer Walk-in/Face-to-Face, or Online by appointment. To schedule an appointment or view walk-in hours, please go to https://www.owens.edu/tutoring/

Counseling Services: Counseling Services provides assistance to students experiencing personal, educational, interpersonal/relationship, family, social, or psychological difficulties. If you feel you may benefit from this service, please contact them at counselingservices@owens.edu. More information is at https://www.owens.edu/counseling/.

Campus and Community Connections: The Center for Campus and Community Connections (College Hall 151) is a walk-in office created to provide retention support through resource stability initiatives and community connections. Go here for more information: https://www.owens.edu/connection/ or contact connections@owens.edu

Owens Library: The Owens Library offers two locations (Toledo and Findlay) as well as online resources. For more information visit https://www.owens.edu/library/.

Students can find more information on campus resources, student support, student life, and security at this link.

Student Code of Conduct: All students are expected to follow Owens Community College's Student Code of Conduct. If you are unfamiliar with the code, it can be found at Student Conduct - Owens Community College

Anti-Discrimination and Harassment & Title IX/Sexual Misconduct: All students, faculty, and staff are expected to follow Owens Community College's Antidiscrimination and Harassment Policy and the College's Title IX/Sexual Misconduct Procedures and Guidelines. The college strictly prohibits and will not tolerate harassment, discrimination, intimidation, or hostile/offensive working or learning environments. If you are unfamiliar with the Anti-Discrimination and Harassment Policy, it can be found at: Owens Community College - Owens Community College
If you are unfamiliar with the Title IX/Sexual Misconduct Procedures and Guidelines, it can be foundat: 11-4-17-Title-IX-Sexual-Misconduct-Procedures-and-Guidelines.pdf

Religious Accommodations: A student seeking an accommodation for an absence permitted under Ohio's Testing Your Faith Act must provide the instructor with a written email notice with the specific dates for an absence, and must do so not later than fourteen (14) days after the first day of instruction. Alternative accommodations are not retroactive, and no academic penalty will be imposed for an absence under the policy*. The request for an alternative accommodation will be kept confidential. Students with questions about a religious accommodation under Ohio's Testing your Faith Act may contact the College's Office of Academic Affairs: provost@owens.edu The policy may be found on the Owens website: 3358:11-2-63 Accommodation for a Student Absence for the Observance of Religious Beliefs and Practices Policy

Document Collection: Throughout the semester, your instructors may ask for a variety of assignments including tests and/or quizzes for student learning of institutional general education competencies or program assessment. Please save all your class materials until the end of the semester.

Classroom Admittance: OCC classes shall only be attended by the officially registered OCC students or perspective students, instructor of record, guest lecturer, or substitute. Visitors are not permitted to be in the classroom and should not be invited to attend or participate in the class. See FERPA regulations for more information.

Inclement Weather Policy: In the event that the College closes due to inclement weather, all on-campus, hybrid, and synchronous mathematics classes will be cancelled. Asynchronous classes will not be affected. If the decision is made to close the College, a public announcement will be communicated via local television, social media, and Owens Alert. Students will not receive individual class cancellation notices.

If the College is open, all on-campus, hybrid, and synchronous classes will meet as regularly scheduled. For addition information about the communication of closings or to learn about Owens Alert, visit https://www.owens.edu/news/weather.html

Grading:

MyOpenMath homework (25%), 4 tests (15% each), and a comprehensive final exam (15%) will be used in determining your grade. If it is to your benefit, your lowest test score (which may due to a missed test) will be replaced with your final exam score. A maximum of one make-up exam will be permitted if timely notification (i.e. test day or before) and the reason for the absence from the test are provided. See the last page of the syllabus for tentative test dates. The grading scale is 100-90 = A, 90-80 = B, 80-70 = C, 70-60 = D, <60 F

Tentative Course Schedule

Week of…	DATE	DATE
DATE	Chapter 2	2
DATE	2	2
DATE	2	2
DATE	3	**Test 1**
DATE	3	3
DATE	3	3
DATE	3	4
DATE	4	**Test 2**
DATE	4	4
DATE	5	5
DATE	5	6
DATE	TBD	**Test 3**
DATE	6	6
DATE	6	TBD
DATE	**Test 4**	Review
DATE	Review	**Final Exam**

Topics

2.1 Vectors in the Plane	4.7 Maxima/Minima Problems
2.2 Vectors in Three Dimensions	4.8 Lagrange Multipliers
2.3 The Dot Product	5.1 Double Integrals over Rectangular Regions
2.4 The Cross Product	5.2 Double Integrals over General Regions
2.5 Equations of Lines and Planes in Space	5.3 Double Integrals in Polar Coordinates
2.6 Quadric Surfaces	5.4 Triple Integrals
2.7 Cylindrical and Spherical Coordinates	5.5 Triple Integrals in Cylindrical and Spherical Coordinates
3.1 Vector-Valued Functions and Space Curves	5.6 Calculating Centers of Mass
3.2 Calculus of Vector-Valued Functions	6.1 Vector Fields
3.3 Arc Length and Curvature	6.2 Line Integrals
3.4 Motion in Space	6.3 Conservative Vector Fields
4.1 Functions of Several Variables	6.4 Green's Theorem
4.2 Limits and Continuity	6.5 Divergence and Curl
4.3 Partial Derivatives	6.6 Surface Integrals
4.4 Tangent Planes and Linear Approximations	6.7 Stokes' Theorem
4.5 The Chain Rule	6.8 The Divergence Theorem
4.6 Directional Derivatives and the Gradient	

The material on Test 1 addresses the following SLOs: 1,2,5
The material on Test 2 addresses the following SLOs: 2-6
The material on Test 3 addresses the following SLOs: 6-12
The material on Test 4 addresses the following SLOs: 14-17
Test 5 is comprehensive