

MATH004A - Intermediate Calculus

General Information

Author(s):	Doonu Barife
Proposal Start:	2017SU
Distance Education Approved:	No
TOP Code:	1701.00
TOP Name:	Mathematics, General
CIP Code:	27.0101
CIP Name:	Mathematics, General
SAM code:	E = Non-occupational
Course Control Number:	CCC000534425
Curriculum Committee Approval Date:	03/23/2015
Board of Trustees Approval Date:	04/21/2015
External Review Approval Date:	07/01/2015
Course Description:	This course covers vector-valued functions, calculus of functions of more than one variable, partial derivatives, differentials, gradients, Lagrange Multipliers, multiple integration, line integrals, surface integrals, Green's Theorem, Stokes' Theorem, and the Divergence theorem.
Submission Rationale:	

Faculty Minimum Qualification Requirements

Master Discipline Preferred:	Mathematics
Alternate Master Discipline Preferred:	No value

Bachelors or Associates Discipline No value

Preferred:

Additional Bachelors or Associates Discipline: No value

Course Development Options

Course Allowed Grade
Basic Number of Options
Skill of Status Retakes

Course 0 Letter Grade methods
is not a basic skills course.

Allow Students to Gain Credit by Exam/Challenge

Rational Retake For Policy Credit Description By Exam/Challenge
 Allow Students To Audit Course

No value No value

Transferability & Gen. Ed. Options

Request for Status Transferability

Transfer Approved to both UC and CSU

Units and Hours

Summary

Minimum Credit Units	Total Course In-Class (Contact) Hours	Total 90	Total Student Learning Hours	Total 270
Maximum Credit Units	Total Course Out-of-Class Hours	Total 180	Faculty Load	

Detail

Weekly Student Hours

In Class	Out Class
Lecture 5	10
Hours	
Lab -	-
Hours	
Activity -	-
Hours	

Course Student Hours

Course Duration (Weeks)

Hours per unit divisor

Course In-Class (Contact) Hours

Lecture

Lab -

Activity

Total 90

Course Out-of-Class Hours

Lecture

Lab -

Activity

Total 80

Units and Hours - Weekly Specialty Hours

No value

Requisites

No value

Entrance Skills

Skill	Content Review
No value	No value

Limitations on Enrollment

Limitation	Provide Rationale
Prerequisite: MATH 003B or qualifying score on Placement Test and proof of Calculus II	

Specifications

Methods of Instruction	Methods of Instruction	Rationale
Instructional methods are enhanced through the use of tables, charts, graphs and/or technology such as graphing calculators or	Lecture Demonstrations	

Maple
software.

C.
Critical
Thinking

Express
a
triple
integral
over
T
as
an
iterated
integral
six
different
ways
using
different
orders
of
integration.

Methods
of
Evaluation

Methods
of
Evaluation
Rationale

Other A.
Homework
assignments

B.
Problem
solving
using
technology

C.
Quizzes

D.
Tests

Equipment value

Textbooks

Author	Title	Publisher	Date	ISBN
Smith Robert T. & Minton Roland B..	Calculus Early Transcendental Function. 4th.	McGraw Hill.	2012.	9780073532325
Stewart, James.	Calculus. 7th.	Brooks Cole.	2012.	9780538497817
Tan, Soo T..	Calculus: Early Transcendentals.	Brooks Cole.	2011.	9780534465544

Learning Outcomes and Objectives

Course Objectives

- Determine equations of lines and planes.
- Demonstrate ability to perform vector operations.
- Demonstrate ability to perform analytic geomtry in 3-space.
- Find the limit of a function at a point and determine where it is continuous.
- Graph surfaces in space (including planes, cylinders and quadratic surfaces).
- Solve physical problems involving position, velocity, and acceleration including finding and interpreting the normal and tangential components of acceleration.
- Compute evaluate and interpret partial derivative both geometrical and physically.
- Write the equation of a tangent plane and a normal line at a point.
- Determine differentiability and compute differentials.
- Find local extrema and test for saddle points.
- Solve constraint problems using Lagrange multipliers.
- Compute arc length and curvature.
- Evaluate double integrals using rectangular and polar coordinates where appropriate.
- Evaluate triple integrals using rectangular, cylindrical and spherical coordinates.
- Find and interpret the divergence and curl of a vector field.
- Determine whether a vector field is conservative and find its potential function if it is conservative.
- Apply a change of variables to integrate functions of multiple variables.
- Compute line and surface integrals.
- Apply Green's, Stokes', and the Divergence Theorem where appropriate.

CSLOs

Find Expected
limits SLO
of, Performance:
differentiate,
and
integrate
vector-
valued
functions.

Find Expected
limits SLO
of, Performance:
differentiate,
and
integrate
functions
of
several
variables.

Course Outline

Course Outline

A.Vectors and Geometry of Space

A.Vectors in two and three dimensions

1. Geometric and algebraic interpretations

H. Position, velocity, and acceleration vectors

I. Normal and tangential components of acceleration

C. Functions of Several Variables

A. Domain of functions of several variables

B. Graphs of functions of two variables

C. Level curves and surfaces

D. Limits and continuity of functions of several variables

E. Partial derivatives and higher-order derivatives of functions of several variables

F. Linear approximations, differentials and applications

G. Chain rules for functions of several variables

H. Implicit differentiation for functions of several variables

I. Directional derivatives, gradient vectors and properties

I. Surface and flux integrals for parametric surfaces and surfaces that are graphs of functions

J. Stokes' theorem

K. Divergence theorem
