MATH 280: DIFFERENTIAL EQUATIONS

1. Course Information

Subject
MATH - Mathematics

Course Number
280

School
Science, Technology, Engineering, Mathematics

Course Title
Differential Equations

2. Hours

Semester Hours
3.00000

Lecture
3

Lab
0

Practicum
0

3. Catalog Description

For display in the online catalog
Topics include modeling and solving first-order differential equations, modeling and solving higher-order differential equations, both linear and non-linear, solution of differential equations by power series and Laplace transforms, matrices and determinants. Technology will be utilized.

4. Requisites

Prerequisites
MATH 267

Corequisites
None

5. Course Type

Course Fee Code
1

Course Type for Perkins Reporting
non-vocational (not approved for Perkins funding)

6. Justification

Describe the need for this course
This is a required course at most colleges and universities for mathematics and engineering majors.

7. General Education

Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course, which satisfies a general education requirement?
Yes

General Education Category
Mathematics

General Education Status
Approved

8. Consistency with the Vision and Mission Statements, the Academic Master Plan, and the strategic initiatives of the College

Please describe how this course is consistent with Ocean County College's current Vision Statement, Mission Statement, Academic Master Plan, and the strategic initiatives of the College:

	Add item
1	Demonstrating the college's commitment to offer comprehensive educational programs that develop intentional learners of all ages.
2	Seeking to ensure that students will thrive in an increasingly diverse and complex world
3	Preparing students for successful transfer to other educational institutions and/or for entrance into the workforce
4	Seeking to empower students through the mastery of intellectual and practical skills.
5	Challenging students to transfer information into knowledge and knowledge into action.

9. Related Courses at Other Institutions

Comparable Courses at NJ Community Colleges

Institution
Brookdale CC

Course Title
Elementry Differential Equations

Course Number
MATH 274

Number of Credits
4

Institution
Mercer County CC

Course Title
Differential Equations

Course Number
MATH 252

Number of Credits
4

Institution
Middlesex County College

Course Title
Differential Equations

Course Number
MATH 234

Number of Credits
4

Transferability of Course

Georgian Court University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MA 218, Differential Equations, 3	Major	

Kean University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MATH3455, Differential Equations, 3	Major	

Monmouth University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MA 311, Differential Equations, 3	Major	

Rowan University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MATH 01231, Ordinary Differential Equations, 3	Major	

Rutgers - New Brunswick, Mason Gross School of the Arts

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
01640244, (no name) 3	Major	

Stockton University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
Math free elective, 3	Elective	

10. Course Learning Outcomes

Learning Outcomes

	Students who successfully complete this course will be able to:
CLO1	Extend mathematical understanding following three semesters of calculus.
CLO2	Show physical science and engineering students problem solving using concepts of calculus.
CLO3	Use a graphing utility and/or computer to solve problems.

11. Topical Outline

(include as many themes/skills as needed)

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
TO1	Differential equations of first-order	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All
TO2	Applications of first-order differential equations	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All
TO3	Homogeneous linear differential equations	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All
TO4	Inverse differential operators	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All
TO5	Laplace transforms	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All
TO6	Power series solutions of differential equations	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All
TO7	General applications of differential equations	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All

TO8	Fourier series and simple Fourier analysis	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All
TO9	Introduction to partial differential equations	Lecture, Computer Lab Activities	Homework, Quizzes, Exams	All

12. Methods of Instruction

In the structuring of this course, what major methods of instruction will be utilized?
Lecture
o Class discussion
o Group discussion
o Computer applications
o Graphing calculator applications

13. General Education Goals Addressed by this Course (this section is to fulfill state requirements)

Information

_____

Quantitative Knowledge and Skills
Yes

Related Course Learning Outcome
All

Related Outline Component
All

Assessment of General Education Goal (Recommended but not limited to)
Course exams

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14. Needs

Instructional Materials (text etc.):
An appropriate textbook, as selected by the department

Technology Needs:
Computer software, such as Derive, Converge, and WinPlot

Human Resource Needs (Presently Employed vs. New Faculty):
Presently Employed Faculty

Facility Needs:
None

Library needs:
None

15. Grade Determinants

The final grade in the course will be the cumulative grade based on the following letter grades or their numerical equivalents for the course assignments and examinations

A: Excellent

B+: Very Good

B: Good

C+: Above Average

C: Average

D: Below Average

F: Failure

I: Incomplete

R: Audit

For more detailed information on the Ocean County College grading system, please see Policy #5154.

16. Board Approval

History of Board approval dates
Reviewed/Revised: December 1990; February 27, 1996; April 30, 1996; December 1998; March 2003; May 4, 2004; February 28, 2006; March 8, 2006; June 2006
Board of Trustees Approval Date: November 6, 2006
Board of Trustees Approval Date: August 24, 2009
Board of Trustees Approval Date: March 26, 2012
Board of Trustees Approval Date: March 29, 2018
Board of Trustees Approval Date: April 26, 2018