OCEAN COUNTY COLLEGE

OFFICIAL COURSE DESCRIPTION

SCHOOL OF MATHEMATICS, SCIENCE, & TECHNOLOGY

1. Course Number and Title: MATH 158: Algebraic Modeling
2. Semester Hours: 4 Contact Hours: ( 4 + 0 )

Lecture + Lab

1. Catalog Description

This course is designed for students in a variety of fields for which a conceptual understanding of college algebra topics is appropriate. Continuous and discrete functions will be studied from graphical, numerical, verbal, and algebraic perspectives with applications to diverse disciplines. Topics will include linear, quadratic, polynomial, exponential, logarithmic absolute value, radical, and rational functions and their application. This course will NOT satisfy the prerequisite for Precalculus courses.

1. PREREQUISITES:

Algebra Placement of no remediation or satisfaction of developmental math courses.

Corequisites: None

1. Maximum Class Size: 35 Course Fee Code: 1

Differential Funding Category: A

Course Type for Perkins Reporting:

\_\_\_ vocational (approved for Perkins funding)

\_x\_ non-vocational (not approved for Perkins funding)

1. Justification
2. Describe the need for this course.

## This course will provide students with the mathematical knowledge needed to integrate mathematics into their chosen area of study or career path. It is designed for students whose major does not require rigorous symbolic manipulation but requires an increased understanding of functions and graphs. Students planning a major in education, social sciences, allied health, and humanities are among those who will benefit from this course.

1. Relationship to courses within the College
2. Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course which satisfies a general education requirement? \_x\_\_ yes \_\_\_ no

If yes, mark with an “x” the appropriate category below.

\_\_\_ Communication \_\_\_ Social Science \_\_\_ History

\_\_\_ Humanities \_\_\_ Lab Science \_\_\_ Science (Non-Lab)

\_x\_ Mathematics \_\_\_ Technology \_\_\_ Diversity

\_\_\_ Information Literacy \_\_\_ Ethical Reasoning/Action

1. If the course does not satisfy a general education requirement, which of the following does it satisfy:

\_\_\_ Program-specific requirement for the following degree program(s):

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_ Elective

1. Related courses in other institutions

[NOTE: The two charts below need to be completed when submitting a new course proposal. They do not need to be completed for most course revisions, unless an Official Course Description is so old that the course’s transferability needs to be reconsidered, as in the case of an obsolete course which may be reactivated.]

1. List any comparable course(s) at other community colleges by completing the table below. Insert “None” if there are no comparable courses.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comparable Courses at NJ Community Colleges | | | | |
| Institution  (ex., Brookdale CC, Mercer CC, Atlantic Cape CC, etc.) | Course  Title | Course Number | Number  of Credits | Comments |
| Brookdale CC | Algebraic Modeling | Math 145 | 4 |  |
| Mercer CC | Applied College Algebra | Mat 140 | 4 |  |
| Sussex CC | Mathematical Concepts | Math 106 | 3 |  |

1. If “None” was inserted, please explain.
2. Complete the table below. The four-year institutions listed below comprise the top six institutions queried on NJTransfer by OCC students.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Transferability of Proposed Course | | | | |
| Institution | Course Code,  Title,  and Credits | Transfer Category  (Major, General Ed.,  or Elective) | Will NOT  Transfer  (Place an “x” in box) | Unable to Determine Status  (Place “U” in box) |
| Georgian Court  University | MA 106 Modern Concepts II -  4 credits | Gen Ed Mathematics |  |  |
| Kean  University | MATHX1006 – 4 credits | Math Free Elective |  |  |
| Monmouth University | MA 105 Mathematical Modeling in Social Sciences - 3 or 4 credits | Mathematics |  |  |
| Richard Stockton College |  | Quantitative Reasoning Gen Ed / Elective Transfer Cr |  |  |
| Rowan  University | Math 01075 – 3 or 4 credits  Math 01123 College Algebra – 3 cr. | GE Math Elective  Gen Ed Mathematics |  |  |
| Rutgers – New Brunswick | Depending on the Rutgers school, the course either transfers as elective credit (New Brunswick) or does not transfer. | Elective Credit |  |  |

1. If a “U” was inserted above, document the course transferability by providing either (a) the name of a contact person at the four-year institution, or (b) an email from the contact person (attach to this proposal).
2. If not transferable to any institution, explain.
3. Consistency with the vision and mission statements, the Academic Master Plan, and the strategic initiatives of the College:

Through the use of technology to perform problem-solving tasks, the proposed course encourages students to think critically about advanced mathematical concepts encountered in their everyday world. By expanding students’ access to quantitative concepts utilized in disciplines other than the science, math, and engineering fields, it thus serves to contribute to the fulfillment of the college mission to “offer comprehensive educational programs that develop intentional learners of all ages and ensure the full assessment of student learning in these programs.” By providing students the conceptual and technological tools to master mathematical problems that they can expect to encounter in their daily lives, this course also contributes to the fulfillment of the divisional goal to prepare “students to thrive in a complex and challenging world” (FY15 Planning Documents of Academic Affairs, 2013). Further, this course will also address the school’s goal to provide courses that help “students to master the fundamental concepts of each discipline, attain the competencies that allow them to critically think, problem-solve, continue their education, and become productive citizens of society” (FY15 Planning Documents of the School of Math, Science, & Technology, 2013).

1. Mark with an “x” the General Education goal(s) addressed by this course:

\_ 1. Communication – Written and Oral \_ 6. Humanistic Perspective

X 2. Quantitative Knowledge and Skills \_ 7. Historical Perspective

\_ 3. Scientific Knowledge and Reasoning \_ 8. Global and Cultural Awareness

\_ 4. Technological Competency/Info Literacy \_ 9. Ethical Reasoning and Action

\_ 5. Society and Human Behavior X 10. Independent/Critical Thinking

1. Specific Course Learning Objectives

Students who successfully complete this course will be able to:

1. Distinguish between a relation and a function when given graphs, tables, or diagrams.
2. Use graphing utilities, spreadsheets, or calculators to evaluate expressions with

function notation.

1. Classify continuous and discrete functions as linear, quadratic, polynomial,

exponential, logarithmic, radical, or rational, given the graph or rule of the function.

1. Relate verbal descriptions of functions to mathematical models.
2. Describe the mathematical characteristics of linear, exponential, logarithmic,

polynomial, and rational functions.

1. Use graphing utilities to identify an appropriate model for a set of data points.
2. Examine charts and graphs to determine the zeros and intercepts of a function.
3. Solve equations and inequalities with the aid of charts, graphs, calculators, and/or

computer software.

1. Graph functions and two-variable equations with the aid of a graphing utility.
2. Solve systems of equations graphically and numerically using charts, graphs,

calculators, and/or computer software.

1. Perform basic algebraic manipulations in the context of solving practical problems.
2. Illustrate problem solving techniques using computer software or graphing utilities.
3. Apply function concepts and mathematical modeling to practical applications.
4. Methods of Instruction

a. Lecture

b. Class discussion

c. Group Projects and Presentations

d. Computer applications

e. Graphing utility applications

f. Laboratory investigations

g. Writing

1. Instructional Materials / Technology Needs / Human Resource Needs (Presently Employed vs. New Faculty)

Text: An appropriate textbook will be selected. Please contact the department for current adoptions.

Technology: Access to PC computer software or tablets with graphing utilities will be

required for use during and between classes.

1. Tentative Topical Outline
2. Modeling Data with Functions – Continuous and Discrete
3. Linear Models
4. Quadratic and Polynomial Models
5. Exponential and Logarithmic Models
6. Rational and Radical Models
7. 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 C Average I Incomplete

B+ Very Good D Below Average W Withdrawn

B Good F Failure R Audit

C+ Above Average P Passing NC No Credit

1. Number of Papers and Examinations

A minimum of three exams and one project.

**APPROVAL PROCESS FOR REVISED COURSE PROPOSALS**

In order to maintain a central file of current course documents on Ocean Cruiser, any changes to the Course Proposal Format or to an Official Course Description must be sent to the Curriculum Committee, College Senate, and Board of Trustees for action or “For Information Only.” This process will ensure that current course information is accessible to Advising, Financial Aid, and the college community and that accurate information will appear in the OCC College Catalog.

|  |  |
| --- | --- |
| **Revisions to the following items must receive action by the Curriculum Committee, College Senate, and Board of Trustees.** | **Revisions to the following items must be sent**  **“For Information Only” to the Curriculum Committee, College Senate, and Board of Trustees.** |
|  |  |
| #1 Course Number & Title | #5 Maximum Class Size / Course Fee Code  Differential Funding Category |
| #2 Semester Hours/Contact Hours | #8 Methods of Instruction |
| #3 Catalog Description | #9 Instructional Materials |
| #4 Prerequisites & Corequisites | #10 Tentative Topical Outline |
| #6 Justification | #11 Grade Determinants |
| #7 Course Objectives | #12 Number of Papers and Examinations |
|  |  |

Board of Trustees Approval Date: January 27, 2014