MATH 157: INTRODUCTION TO DATA SCIENCE

History

1. Oct 14, 2021 by Pinkava Samuel (spinkava)
2. Oct 28, 2021 by O'Connor Susan (soconnor)

Viewing: MATH 157 : Introduction to Data Science
Last approved: Thu, 28 Oct 2021 08:01:28 GMT
Last edit: Wed, 27 Oct 2021 16:24:20 GMT

1. Course Information

Subject
MATH - Mathematics

Course Number
157

School
Science, Technology, Engineering, Mathematics

Course Title
Introduction to Data Science

2. Hours

Semester Hours
4

Lecture
4

Lab
0

Practicum
0

3. Catalog Description

For display in the online catalog
Introduction to Data Science will provide students with data literacy skills in order to understand techniques in data manipulation, visualization, and interpretation. This project-based course will allow students to utilize a toolkit of statistical software to perform data science methods.

4. Requisites

Prerequisites
None

Corequisites
None

5. Course Type

Course Fee Code
2

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

6. Justification

Describe the need for this course

Data science is the foundation of several fields related to data analytics, including big data, artificial intelligence, and machine learning. This course will provide both the mathematical and programming skills necessary to succeed in several courses related to analyzing data.

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

Proposed

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	Mission & Vision Statemen: This innovative course will further secure our academic leadership.
2	Academic Master Plan Goal 3a: Create New Programs and Certificates
3	Strategic Goal 1: Empower Students to Learn, Engage, and Achieve

9. Related Courses at Other Institutions

Comparable Courses at NJ Community Colleges

Institution

County College of Morris

Course Title

Introduction to Data Science

Course Number

MAT-114

Number of Credits

3

Institution

Brookdale CC

Course Title

Data Science and Statistics II

Course Number

MATH 132

Number of Credits

4

Transferability of Course

Georgian Court University

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

Kean University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MATH3710		

Monmouth University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CS001 (CS Elective)		

Rowan University

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

Rutgers - New Brunswick, Mason Gross School of the Arts

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
		Will not transfer

Stockton University

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

10. Course Learning Outcomes

Learning Outcomes

	Students who successfully complete this course will be able to:
CLO1	Produce and interpret data visualizations and numerical summaries to describe and explore large data sets.
CLO2	Investigate and explore relationships between more than two variables with multivariate analysis.
CLO3	Solve problems utilizing programming languages for data scientists.
CLO4	Clean and prepare data for analysis; identify problems with messy and missing data.
CLO5	Communicate findings and outcomes based on data science techniques.
CLO6	Explain the relationships of the sub-fields of data science.

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	The Data Science Model	Practice Problems	Quizzes & Projects	ALL
TO2	R Programming - Base Functions - Data Aggregation - Workflow Basics	Practice Problems	Quizzes & Projects	CL3
TO3	Data Visualization - Grammar of Graphics - Facets - Objects - Transformations	Practice Problems	Quizzes & Projects	CL1; CL2

TO4	Tidy Data & Data Transformation - Pipes - Filters - Sub-setting - Grouping - Missing Values - Relational Data	Practice Problems	Quizzes & Projects	CL4
TO5	Exploratory Data Analysis - Patterns - Modeling - Predictions	Practice Problems	Quizzes & Projects	CL1; CL2
TO6	Applications of Data Science - Big Data - Artificial Intelligence & Machine Learning - Business Analytics	Practice Problems	Quizzes & Projects	CL5, CL6

12. Methods of Instruction

In the structuring of this course, what major methods of instruction will be utilized?
Direct instruction and active learning activities.

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)
Projects

_____

_____

_____

_____

_____

_____

_____

_____

_____

14. Needs

Instructional Materials (text etc.):
Text and OER resources determined by department.

Technology Needs:
RStudio software package

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
New course board approved: September 23, 2021

Key: 2239