RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

MATH 296H
MATHEMATICS AND STATISTICS RESEARCH CAPSTONE HONORS

I. Basic Course Information

A. Course Number and Title: MATH 296H Mathematics and Statistics Research Capstone Honors

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall   Year: 2024

D. Effective Term: Fall 2025

E. Sponsoring Department: Mathematics and Computer Science

F. Semester Credit Hours: **3**

G. Weekly Contact Hours: 0   Lecture: 0
Laboratory: 0
Out of class student work per week: 9

H. ☐ Prerequisite (s):
☒ Corequisite (s): Student must be enrolled in his or her last Honors College academic year before graduation.

I. Additional Fees: None

II. Catalog Description

Corequisite: Student must be enrolled in his or her last Honors College academic year before graduation.
This course is intended to guide sophomore Honors College students from all disciplines through the stages of conducting a semester-long research project in Mathematics or Statistics. Topics cover various areas of mathematics, mathematics education, mathematical proof or statistical analysis. The methodology includes but is not limited to planning, research, problem solving, and documentation, all presented in both written reports, and oral presentations., Students will become proficient in ways of framing arguments, gathering information from journal articles and/or data, and coming to conclusions both within and beyond their fields of study, which will help them develop a more interdisciplinary perspective. The course will include research training

and developing a timeline, as well as independent study, research, and learning how to write a well thought out research report along with professionally presenting findings.

III. Statement of Course Need

    A. Research on the value of intensive undergraduate research experiences abounds, and requiring enrollment in this research capstone will provide RVCC Honors College students with: a strong student-faculty collaboration and scholarship; an original research to the discipline; an understanding of intensive research in preparation for classes in the major or for more intensive graduate school research; and a high profile project that will aid in transfer applications.

    Class will consist of five major components: library instruction, research and guidance with faculty member, group discussions on topics and progress, the final written (or artistic) project, and a formal presentation.

    B. This course has no lab component.

    C. This course is not designed for transfer, yet dependent on transfer institution may transfer as a Mathematics program elective.

IV. Place of Course in College Curriculum

    A. Free Elective
    B. This course does not meet a General Education requirement.
    C. This course meets a program requirement for the Honors College.
    D. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites.

V. Outline of Course Content

    Class will consist of the following major components:
    1. Information literacy instruction to support research in Mathematics or Statistics
    2. Advanced Mathematics or Statistics topic exploration
    3. Literature research utilizing discipline-specific information sources, databases, interlibrary loan, etc.
    4. Background research and discussion of the capstone topic with capstone Mathematics faculty advisor to create a timeline of completion
    5. Develop methods to understand and analyze the Mathematics or Statistics research topic
    6. Application of Mathematics or Statistics research topic and results to relevant situations

7. Research and guidance with capstone Mathematics faculty advisor via weekly consultations to discuss results, assess progress and adjust timeline as needed.
8. The final Mathematics or Statistics capstone project
9. A formal capstone presentation (Capstone Day).

VI.   A. <u>Course Learning Outcomes</u>:

At the completion of the course, students will be able to:

1. Logically and persuasively state and support orally and in writing their findings from the research or creative project. (GE-1, *****)
2. Evaluate relevance and authority of information. (GE-IL)
3. Create and revise drafts to address capstone objectives and employ standard appropriate editing practices for the specified discipline. (GE-1)
4. Use discipline-specific information sources and/or databases to better understand the research topic and find existing research in the field. (GE- IL)
5. Complete a research project or develop product that incorporates newly acquired and prior information and is delivered in a medium appropriate to the discipline and intended audience. (GE-IL)
6. Cite sources, compile a bibliography, and make consistent and correct use of a citation style appropriate to the discipline (GE-IL)
7. Explain and present all aspects of their Mathematics or Statistics capstone project

(*Embedded critical thinking)

B. <u>Assessment Instruments</u>

1. Research process
2. Final capstone product
3. Capstone project presentation

VII. Grade Determinants

What factors may enter into the determination of the final? LIST the grade determinants. Please note any grade determinants that will be *required* for the course. For example:

A. Research process
B. Completion of agreed upon timeline deadlines
C. Revisions of drafts
D. Final capstone product oral presentation

Given the goals and outcomes described above, the primary formats, modes, and methods for teaching and learning that may be used in the course:
A. lecture/discussion
B. small-group work
C. computer-assisted instruction
D. guest speakers and lecturers
E. student oral presentations
F. student-faculty collaboration
G. independent study and research

VIII. Texts and Materials

Any texts and materials will be dependent upon individual capstone project requirements.

Please Note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.

IX. Resources
Resources may include any of the following:

A. Databases
B. Archives
C. Subject matter experts

X. Check One: ☒Honors Course ☐Honors Options ☐ N/A

This is a course specifically designed for the honors college. There is not a non-honors course offered to which this course can be compared. Thus, the entirety of the course is focused on honors content and methods, and completion of the course is required to graduate from the Honors College.