A.) COURSE DESCRIPTION
The aim of this 3-credit course is to introduce basic statistical methods commonly used to solve bioinformatics problems. Basic relevant concepts from probability, statistical inference will be introduced and illustrated by examples from bioinformatics applications. Statistical programming language R will be introduced and used to solve statistical problems.

B.) PRE/CO-REQUISITES
Prerequisite or Co-requisite: BINF 1101 (Introduction to Bioinformatics) and one of MATH 1100 (College Algebra) and MATH 1120 (Calculus), or by instructor’s permission.

C.) LEARNING OBJECTIVES
Having successfully completed this course, the student will be able to:
• Master the basic concepts and theories in probability and statistics.
• Understand the basic statistical methods commonly used to solve bioinformatics problems.
• Be able to use R to solve statistical problems.
• Lay a solid foundation in probability and statistics for more advanced statistical bioinformatics courses.

D.) INSTRUCTIONAL METHODS
The course will be presented in a lecture format and interactive demonstrations of R programming in computer lab.

E.) GRADING
Homework (40%) + Mid-term (25%) + Final (25%) + attendance and classroom questions (10%)

F.) TOPICAL OUTLINE OF COURSE CONTENT
• Introduction to R
• Basic probability and statistics
• Random variables and distribution functions
• Introduction to classic hypothesis tests: $t$-tests, and non-parametric tests
• Correlation and regression
• Statistics for -omics data analysis

G.) POLICIES AND PROCEDURES
a. ACADEMIC INTEGRITY
All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code. The Code is available from the Dean of Students Office or online at: http://www.legal.uncc.edu/policies/ps-105.html. A set of links to various resources on plagiarism and how to avoid it is available at the UNCC Library website: http://library.uncc.edu/display/?dept=instruction&format=open&page=920.
b. ATTENDANCE

Attendance at lecture is required, although exceptions will be made for reasons such as illness or family emergency. Excessive absences will result in a reduced classroom participation score at the instructor’s discretion, and will negatively impact the overall course grade.

H.) RECOMMENDED BOOKS AND LEARNING MATERIALS

- *The Vassar stats online textbook*: [http://vassarstats.net/textbook/](http://vassarstats.net/textbook/)