Course Assessment Document for CS 125 Introduction to R

Departmental Outcomes

1. Proficiency in computational thinking

2. Ability to analyze systems at the three levels of computer science: theory, software, and hardware

3. Proficiency in the design and implementation of algorithms using multiple programming languages

4. Ability to apply computational thinking to a diverse set of problems and disciplines

5. Ability to communicate effectively and collaborate with others

6. Ability to adapt to new challenges and computational environments

Course Description

An introduction to the programming language R and how it can be used for statistical analysis and visualization of data. Students will learn how to write basic R programs that can read, write, and manipulate data. They will make use of R functions for executing common statistical analysis and learn how to display the results using graphs and charts. Through a series of projects, students will get experience with writing their own functions, learn how to make use of R documentation and how to extend their own knowledge of the language.

Prerequisites: None

Rationale for prerequisites: The course is intended for students with little or no experience with computer science or programming who need to make use of the programming language R in their coursework or research.

Desired Course Outcomes

A. Students can read a simple R program and correctly predict its behavior.

B. Students can write programs in R to read, write, and manipulate data.

C. Students can write programs in R to execute common statistical analyses and generate visualizations of the results.

D. Students have experience with the concepts of functions, modularity, and abstraction.

E. Students have experience with R documentation and how to extend their knowledge on their own.

We will disseminate the desired course outcomes to students via the course web page, syllabus and in class.

Course Matrix

Outcome	Activities	Method of Assessment	Departmental Outcome
A	Videotaped lectures, Homework, Projects	Graded projects, HW	1, 3
B	Homework, Labs, Projects	Graded projects, HW	1, 3, 4
C	Homework, Labs, Projects	Graded projects, HW	1, 3, 4
D	Homework, Labs, Projects	Graded projects, HW	1, 3, 4
E	Homework, Labs, Projects	Graded projects, HW	6

Course Format

This course is a 1-credit course with CR/NC grading that will meet for only the first four weeks of the semester. A series of 12 lectures, 30-min each, will be provided as videos for students to watch on their own time. In addition, each student will be required to attend two 50-min lab sessions per week, complete 8 short projects, and take a final quiz.

Grade Calibration Matrix

Outcome	Meaning of the grade CR
A	The student can understand simple R programs given to them and correctly specify their behavior.
B	The student can create a working R program to read data, manipulate data frames, and write data out to a new file.
C	The student can create a working R program that executes an analysis or visualization that meets a given specification.
D	The student can create functions in R with appropriate parameters to solve a given problem.
E	The student is able to learn how to make use of new capabilities and functions in R using available documentation.

Outcome	Meaning of the grade NC
A	In most cases, the student cannot understand R programs given to them and figure out their behavior.
B	In most cases, the student cannot create a working R program that reads, writes, or manipulates data given a specification.
C	In most cases, the student cannot create a working R program to execute a statistical analysis or visualization given a specification.
D	In most cases, the student cannot create functions with appropriate parameters to solve the problem given.
E	The student has difficulty learning how to make use of novel capabilities or functions using available documentation.