

## **AMS 597 (3 credits, Spring 2024) Statistical Computing**

<b>Instructor</b>	Changsoon(C.S.) Park Research Professor, Department of Applied Mathematics & Statistics, SUNY Korea
<b>Class</b>	Mon, Wed 2:00 PM - 3:20 PM
<b>Office</b>	A611
<b>Office Hour</b>	Mon, Wed 09:00-10:30
<b>Phone</b>	1916
<b>E-Mail</b>	Changsoon.park@stonybrook.edu
<b>Text</b>	Introductory Statistics with R, 2nd Edition, Springer Peter Dalgaard ISBN: 978-0-387-79053-4 An Introduction to Mediation, Moderation, and Conditional Process Analysis  A Regression-Based Approach Andrew F Hayes ISBN: 978-1-4625-34675-4
<b>Prerequisite</b>	AMS 310 or AMS 315
<b>Room</b>	B206
<b>Grading</b>	ABCDF grading

### **Course Description:**

This course is designed for students interested in statistics and their applications. Basic statistical techniques including sampling, design, regression, and analysis of variance are introduced. In addition, Path analysis especially for mediation, moderation, and conditional process effect model will be studied. The lecture includes the use of statistical packages such as R. Students translate realistic research problems into a statistical context and perform the analysis. R program should be installed in each student's computer.

### **Learning Outcomes:**

- 1) Understand basic methodology for manipulating data sets, especially with variable transformation, stacking and unstacking, missing handling.
- 2) Understand basic concepts of various Statistical methods.
- 3) Understand mediation and moderation process models
- 4) Understand how to apply those methods into R syntax.
- 5) Understand how to interpret the outputs of R in the statistical sense.
- 6) Understand the process analysis concepts and apply them to R program.

### **Grades:**

Class attendance – 10%

Homework – 10%  
Midterm I, II – 20% each (April 3, May 1)  
Final – 40% (TBA)

Homework will be assigned at the end of two or three chapters, and is due one week from the day it is assigned on. Each student must turn in the homework at the beginning of the lecture on the due date. Late homework will not be accepted. Solutions will be posted on the webpage after the due date. All homework should be submitted via Blackboard.

All exams will be taken using each student's computer.

Final grade will be given according to the distribution of sum of five items.

### **Lectures:**

Lecture notes will be available to be downloaded from the course webpage.

No reference is needed, and examples and problems only in the textbook will be explained.

Bring the textbook and a notebook computer to the class.

### **Academic Integrity:**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

### **School Policy on Attendance:**

1. If a student has over 20% unexcused absences, the student's final course grade will be an F.
2. Students should report the reason of absence to the professor in advance, or immediately after the absence.
3. When a student excuses his/her absence, the student must provide documentation of the reason for the absence to the professor.
4. The professor of the course reserves the right to excuse absences.
5. The professor may excuse the absence if the submitted documentation fulfills the following conditions: extreme emergencies, severe medical reasons with doctor's note, very important events.

### **Tentative Course Schedule**

Week	Dates	Chapter	Topic
1	2/26, 2/28	Chapter 1	Basics
2	3/4, 3/6	Chapter 2	The R Environment
3	3/11, 3/13	Chapter 3	Probability Distributions
4	3/18, 3/20	Chapter 3	Probability Distributions

		Chapter 4	Descriptive Statistics & graphics
5	3/25, 3/27	Chapter 4 Chapter 5	Descriptive Statistics & graphics One & Two Sample Tests
6	4/1 4/3	Review Midterm #1	
7	4/8 4/10	Chapter 6 No Class	Regression & Correlation
8	4/15, 4/17	Chapter 7	Analysis of Variances
9	4/22, 4/24	Chapter 8 Chapter 9	Tabular Data Power and the computation of sample size
10	4/29 5/1	Chapter 10 Midterm #2	Advanced Data Handling
11	5/6 5/8	No Class Chapter 11 Chapter 12	Multiple Regression
12	5/13, 5/14(Tues) 5/15	Chapter 12 Chapter 13 No Class	Linear Models Logistic Regression
13	5/20, 5/22	Hayes' book	Part II
14	5/27, 5/29	Hayes' book	Part III
15	6/3  6/5	Within-Subject Model Review	

### Classroom Mask Policy

*"Everyone participating in this class during in-person sessions must wear a mask or face covering at all times or have the appropriate documentation for medical exemption. Any student not in compliance with this policy will be asked to leave the classroom. If students need to drink or eat, they should step out of the classroom to do so."*