The George Washington University
Department of Statistics
STAT 1051-Section 12: Introduction to Business and Economic Statistics
<mark>**Tentative Syllabus (Updated on Aug 19, 2021)**</mark>

Course information
    Semester: Fall 2021, from Aug 31 (T, first class) to Dec 9 (R, last class)
    Class: **TR 2:20pm-3:35pm (DC Time, i.e., Eastern Time)**
    Location: **MPA 309**
    No Class/Recitation: Nov 24-25 (WR, Thanksgiving Break), Dec 7 (T, Designated Friday)

Instructor
    Name: Dr. Xiaoke Zhang
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    Office hours: **TBA**, or by appointment

Teaching assistant (TA)
    Name: TBA
    Campus Address: TBA
    Email: TBA
    Recitation: W 12:45pm-1:35pm (1957 E 112, Section 34) and 11:10am-12:00pm (TOMP 301, Section 35)
    Office hours: **TBA**, or by appointment

Course description
    This is an introductory course on statistics, which covers the following fundamental elements of statistics: frequency distributions, descriptive measures, probability, probability distributions, sampling, estimation, tests of hypotheses, regression and correlation, and applications to business.
Note: STAT1051, 1053, 1111 and 1127 are related in their subject matter, and credit for only one of them may be applied toward a degree.

Course prerequisites
    Arithmetic and algebra at the high school level may be needed.

Learning outcomes
    Students will learn analyze "small data" (of small size, low dimension, and simple structure) and interpret classical statistical results. As a result of completing this course, students will be able to
1. Distinguish different data types;
2. Perform exploratory analysis in terms of various summary statistics and visualization tools;

3. Calculate probabilities for important distributions;
4. Conduct univariate statistical analysis using confidence intervals and hypothesis testing procedures;
5. Describe and interpret bivariate relationship in terms of simple linear regression and correlation (if time permits);
6. Utilize software, i.e., R, to analyze real datasets.

Required textbooks and recommended reference
1. **REQUIRED textbooks (<mark>either hard or electronic copy</mark>):**
- **Main textbook (MBS):** *Statistics for Business and Economics*, **14th Edition, Pearson.** Authors: McClave, Benson and Sincich
- **Supplementary textbook (FPP):** *Statistics*, 4th Edition, W. W. Norton & Company. Authors: Freedman, Pisani and Purves
2. Recommended reference: Student solution manual for MBS.

Blackboard.
   Blackboard is the only online management system for this course and please get familiar with Blackboard and check it frequently. It will be used by the instructor and/or TA for posting announcements (**Announcements**), course materials (**Electronic Reserves**), assignments (**Assignments**), tests (**Tests**), lecture/recitation recordings (**GW Lecture Capture**), grades, etc.

Average amount of direct instruction or guided interaction with the instructor
   2.5 hours per week.

Average minimum amount of independent (out-of-class) learning
   5 hours per week.

Week-by-week schedule of topics to be presented and scheduling of final examinations
   This is a tentative plan. The actual schedule may be slightly different.

Week	Suspended Classes	Topics
1		Introduction; Describing Data
2	Labor Day (M)	Describing Data
3		Describing Data
4		Probability
5		Probability
6	Fall Break (F)	Random Variables and Distributions
7		Random Variables and Distributions
8		Sampling Distributions
9		Sampling Distributions
10		One-Sample Inferences

11		One-Sample Inferences
12		One-Sample Inferences
13	Thanksgiving Break (WR)	One-Sample Inferences
14		One-Sample Inferences
15	Designated Friday (T)	Review
NOTE: In accordance with university policy, the final exam will be given during the final exam period and not the last week of the semester. For details and complete policy, see: https://provost.gwu.edu/administration-final-examinations-during-examination-period		

Grading
1. Composition: Total=101%
   a. Homework (25%)
      i. Homework will be assigned and posted on **Blackboard/Assignments**.
      ii. Each student will be **assigned to a group** (group assignment TBA by the instructor) before the first homework. Each group will submit one copy of each homework, and **all members in the same group will receive the same grade** for each homework. Group discussion is encouraged, but all submitted homework by different groups must be completed independently.
      iii. Each homework **MUST be submitted by email to the TA** at TBA by its due date/time. **The email writer MUST CC all the other members in the same group; otherwise the homework won't be accepted.** Late homework will NOT be accepted either.
      iv. Homework answers may be either typed, or handwritten and then scanned, or both, but **ONLY ONE file (MS Word or PDF)** may be submitted. Multiple submissions are allowed, but **only the last submission by its due date/time will be graded**.
      v. Grade will be based on completion of all problems with sufficient justification (50%) and correctness of the answers (50%). Solutions will be posted on Blackboard. **One homework with the lowest grade will be dropped** before calculating the overall grade.
   b. Quizzes (16%=4% × 4): Six quizzes will be given on the following dates: **Sep 16 (R), Sep 30 (R), Oct 14 (R), Oct 28 (R), Nov 11 (R), and Dec 2 (R). Four highest quiz grades (4% each) will be counted** towards the overall grade. Detailed information will be given before the first quiz.
   c. Midterms (30% = 15% + 15%): Two midterms will be given. The dates are **Oct 21 (R)** and **Nov 18 (R).** Detailed information will be given about one week before each midterm.
   d. Final exam (30%): As scheduled by the Office of the Registrar, the final exam will be given on **TBA**. Detailed information will be given by the last week of the semester.

2. Final Grade Curve: Below is a minimum guarantee:

90.00 or above=A, 89.99-87.00=A-, 86.99-84.00=B+, 83.99-81.00=B, 80.99-78.00=B-, 77.99-75.00=C+, 74.99-72.00=C, 71.99-69.00=C-, 68.99-66.00=D+, 65.99-63.00=D, 62.99-60.00=D-, < 60.00=F.

Course policies
1. Attendance: Attendance is required for all students but won't be checked. If you miss a class or recitation, the instructor or TA will NOT provide a makeup class or recitation; please go to Blackboard to find relevant course materials and announcements. Those who are not enrolled in this course are NOT allowed to attend any class or recitation.
2. Makeup quizzes/exams: No makeup quizzes or exams will be given except for emergencies with proper documentation. Requests for makeup quizzes or exams must be made to the instructor by email for approval BEFORE the original quiz/exam time. If approved, students are responsible for both reminding the instructor of giving makeup quizzes/exams and taking them within one week of the original quiz/exam dates. Any missed quiz or exam will be counted as zero point.
3. Disputes on grades: Contact the instructor and TA within one week after the grades are posted on Blackboard.
4. Asking questions: Office hours are absolutely the best time to ask questions and receive prompt answers. It is not recommended to ask questions by email since it is very inefficient, and it is often unrealistic to receive immediate responses. If you have to ask questions by email, itemize all your questions in one email for clarity and convenience to reply (writing emails is NOT texting). The instructor typically checks emails ONLY on workdays.

Advice
1. Syllabus: **The syllabus serves as a reliable guideline for the course. Please keep the latest version of the syllabus and get familiar.** You can find the answers to a lot of your questions regarding this course from the syllabus.
2. Attitude: Sufficient in-class and out-of-class efforts are needed to receive a satisfactory grade (no pain no gain).
3. In-class learning:
   a. **Due to time limit, lectures by the instructor focus on motivations, concepts, important formulas and skills, and representative examples (not many).**
   b. Recitations primarily focus on exercises and software use.
4. Recommended learning strategy:
   a. Attend lectures and recitations.
   b. After each lecture or recitation:
      i. Review recordings, lecture/recitation slides, your own notes and corresponding chapters of the textbooks, independently or in groups, preferably within one day after each class (suggested by the Ebbinghaus "forgetting curve").
      ii. Redo lecture/recitation examples independently or in groups.

        iii. Attend office hours with your remaining questions.
- c. After each homework is assigned:
    - i. <u>Start working on each homework as soon as it is assigned</u>.
    - ii. Scan through homework problems. If you feel difficult in working on a majority of them, review the notes and textbooks again, and/or discuss with classmates; otherwise do homework independently with minimum reference to the notes or textbooks.
    - iii. After each homework is returned, compare your answers with solutions and/or discuss with other classmates. If there are many errors, review the notes and textbooks again, and/or discuss with other classmates.
    - iv. Attend office hours with your remaining questions; do more textbook exercises if necessary.
5. Calculators: **Get familiar with your calculator** (and your backup calculator). Use it when doing homework (for this course and others).
6. Internet: Search engines are our friends!

University policies

Academic Integrity Code

Academic integrity is an essential part of the educational process, and all members of the GW community take these matters very seriously. As the instructor of record for this course, my role is to provide clear expectations and uphold them in all assessments. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and otherwise violate the Code of Academic Integrity. If you have any questions about whether or not particular academic practices or resources are permitted, you should ask me for clarification. If you are reported for an academic integrity violation, you should contact the Office of Student Rights and Responsibilities (SRR) to learn more about your rights and options in the process. Consequences can range from failure of assignment to expulsion from the university and may include a transcript notation. For more information, please refer to the SRR website (https://studentconduct.gwu.edu/academic-integrity), email rights@gwu.edu, or call 202-994-6757.

University policy on observance of religious holidays

Students must notify faculty during the first week of the semester in which they are enrolled in the course, or as early as possible, but no later than three weeks prior to the absence, of their intention to be absent from class on their day(s) of religious observance. If the holiday falls within the first three weeks of class, the student must

inform faculty in the first week of the semester. For details and policy, see "Religious Holidays" at provost.gwu.edu/policies-procedures-and-guidelines.

Use of Electronic Course Materials and Class Recordings

Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Please contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Please contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

Academic support

Writing Center

GW's Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online at gwu.mywconline.

Academic Commons

Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, access other academic support resources, or obtain assistance at academiccommons.gwu.edu.

Support for students outside the classroom

Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services at disabilitysupport.gwu.edu to establish eligibility and to coordinate reasonable accommodations.

Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services.

Safety and Security

- In an emergency: call GWPD 202-994-6111 or 911

- For situation-specific actions: review the Emergency Response Handbook at: safety.gwu.edu/emergency-response-handbook

- In an active violence situation: Get Out, Hide Out, or Take Out. See go.gwu.edu/shooterpret

- Stay informed: safety.gwu.edu/stay-informed

Statistical Software

    <u>**Copy and paste each link in a web browser to find each webpage.**</u>

    Step 1: Download and install **R**.

        (1) Go to https://www.r-project.org.

        (2) Click **download R**.

        (3) Among the list of CRAN mirrors, click any link in the USA.

        (4) Download R for Linux, Mac OS X or Windows (depending on your computer).

        (5a) For Windows, download base.

        (5b) For Mac OS X, download the latest version (a .pkg file) that is compatible with your laptop's OS version. To check the OS version of your laptop, you can click the small apple icon ☐ on the top-left corner of your laptop screen and choose "About This Mac". Then you can find the version number under "**macOS**".

        (6) Install R after the download is complete.

    Step 2: AFTER R is installed, download and install **RStudio**.

        (1) Go to https://www.rstudio.com/products/rstudio/download/

        (2) Click DOWNLOAD under RStudio Desktop (Open Source License, FREE).

        (3) Download the installer that is compatible with your laptop and install RStudio.

   *Step 3*: Install the R package **R Commander** in RStudio.

        (1) Open RStudio.

        (2) Click "Packages" in the bottom-right window; click "Install"; type and select **Rcmdr** under "Packages"; click "Install". You may see a lot of code running in the Console, which is normal, so don't worry.

(3) For Mac OS X users, download and install XQuartz (https://www.xquartz.org), and **restart your laptop**. For Windows users, skip this step.
(4) Type the command *library(Rcmdr)* in the RStudio Console, and install all missing packages if any.
(5) To use R Commander in the future, open RStudio, and type the command *library(Rcmdr)* in the Console.
(6) When a window like below pops up, congratulations-the installation is complete and successful!

Example: Import data to R Commander in RStudio.
(1) Download the MBS data zip folder from Blackboard -> Electronic Reserves and unzip it in your local computer.
(2) Open RStudio.
(3) Type the command *library(Rcmdr)* in the RStudio Console.
(4) In the window below, click "Data"-> "Import Data"-> "From Excel File"-> "OK" -> Select an Excel data file within a specific chapter subfolder of the MBS data folder and click "OK". If you are asked to select one table of the Excel file, always select "Sheet 1".
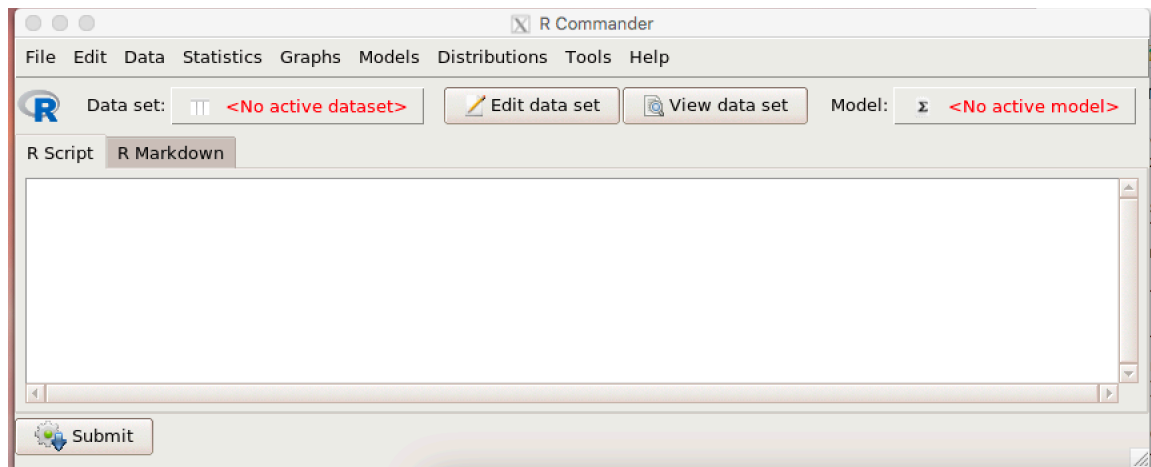
More installation notes for trouble shooting can be found here:
https://socialsciences.mcmaster.ca/jfox/Misc/Rcmdr/installation-notes.html

Disclaimer
The instructor retains the right to revise the syllabus. Whenever the syllabus is changed, announcements will be made in class and/or on Blackboard.