**QMB-3200**
**Business & Economic Statistics II – Summer 2023**

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Office Hours: By appointment in person and via Teams

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**PREREQUISITES:** MAC 2233 / MAC 2241, QMB 2100.
STA 2023 can serve as equivalent to QMB 2100.
Students should have earned a "C" grade or better (and not C-) in QMB 2100 or STA 2023.

**COURSE DESCRIPTION:** This is a Core course for all Business Majors.

**Catalog Description of the course:** Simple linear regression and correlation, multiple regression and model building, forecasting models, analysis of variance, chi-square tests, nonparametric methods.

**Purpose of the course:** QMB 3200 is the second course in Statistics. It builds upon the foundation established in your first course in Statistics (QMB 2100 or its equivalent). The purpose of QMB 3200 is to prepare students to appreciate the role statistics plays in business analytics and decision making. In particular, the course emphasizes and prepares students to "learn", "interpret", and "be ready to apply" the concepts and methods, rather than learn calculations alone.

**COURSE OBJECTIVES:** Through this course, students would develop a working knowledge and expertise on how to apply statistical methods on business problems. In particular, students will be able to:

1. Strengthen fundamentals, formulate hypothesis from the problem statement, and learn to perform analyses,
2. Interpret statistical results generated from a selected software program and communicate the findings in simple terms to the decision-maker.
3. Identify opportunities for and learn to apply statistical tests on Categorical data such as contingency analysis and goodness of fit tests
4. Explain the basis and apply Analysis of Variance (ANOVA) techniques on data from experiments/observational studies in business
5. Identify application opportunities and learn to perform simple linear and multiple regression analyses, extract valuable information, and apply the results for predictions and improved business decision-making
6. Analyze Time-series patterns and learn to apply forecasting methods for various business applications

**COURSE STUDENT LEARNING OUTCOMES**: At the conclusion of the course students should be able to:

1. Develop a hypothesis from a problem statement, choose an appropriate statistical technique to apply given the problem context, perform the analysis; and most importantly, interpret the reports/results, and develop well-reasoned and evidence-based conclusions
2. Learn to perform hypotheses tests on categorical data using Chi-Square goodness of fit tests and tests of

independence Understand the principles of designed experimentation, identify an appropriate experimental design to perform Analysis of Variance (ANOVA) on data from experimental/observational studies; develop hypothesis statements, perform the analysis, understand, and interpret ANOVA output from a select software; and develop conclusions

3. Develop both simple and multiple regression models from given data, understand and interpret regression analysis output from a select software package, test hypotheses and infer relationships between variables, and make predictions on response.
4. Develop an understanding for patterns in Time Series data, select appropriate forecasting techniques given the pattern, develop forecasts and forecast accuracy measures to identify the best forecasting method

**TOPICS TO BE COVERED:**

- Review of Concepts and Topics (Probability Distributions, Estimation, and Hypothesis Testing) from QMB 2100 that are important for QMB 3200
- Categorical Data Analysis – Chi-square Tests
- Analysis of Variance
- Simple Linear Regression
- Multiple Regression
- Time Series Analysis and Forecasting

## MATERIALS

**(Required) Statistics for Business & Economics** (13th or 14th edition), Pearson Education, McClave, Benson, and Sincich. Copies of this text are available for purchase at the USF Bookstore and other retailers. Both a hard copy and an electronic version are available.

**(Required) STATISTIX 10.0** This software can be purchased for Windows only. It is also available for free using the apps.usf.edu gateway (Mac or Windows). **It is highly recommended that you purchase and install this software** on your laptop or one that is available to you. Application Gateway can be problematic, and students are responsible for having reliable access to the STATISTIX program. Issues relating to the Application Gateway should be directed to USF Information Technology (https://www.usf.edu/it/), **NOT THE INSTRUCTOR OR THE TAs.**

**(Recommended) Pro-Copy Packet** A spiral-bound course packet is available for purchase from Pro-Copy located at 5219 E. Fowler Avenue, Tampa, FL 33617. This packet includes course notes, practice exam questions, and more. Historically, students have found the Pro-Copy packet extremely useful.

**(Required) Student Data Set** – each student is required to collect and enter into an Excel spreadsheet or directly into Statistix 10 a data set consisting of 75 used automobiles, 25 each from three different models of vehicles of your choice (for example, Toyota Camry, Honda Accord, and Nissan Altima). For each vehicle, you will enter the asking price, the number of miles, whether it was made in the year 2015 or earlier (enter as 0) or 2016 or later (enter as 1), and the vehicle model (label as 1, 2, or 3). When entering the asking price and mileage, please use numbers only without dollar signs or commas. Information regarding the requirements for the Student Data Set will be posted to the Resources module in Canvas. You will receive more instruction regarding this data set during the first week of class and will begin collecting your data then; you do not need to have this data already collected at the start of class.

## COURSE POLICIES

**Format**

This course will be conducted entirely online in an asynchronous manner. Weekly Modules will be published, and you will be responsible for completing that week's assignments by **Saturday at 11:59pm** at the end of each week. You will watch two recorded lectures and then complete a short test and an assignment.

All of the week's lectures and assignments will be posted to Canvas by the end of the day on the Saturday preceding that week, giving you through the following Saturday to watch the lectures and complete the work. Occasionally the material may be posted in advance and you will be able to work ahead, but keep in mind that this is not a "work at your own pace" course. You will need to be able to be "present" for the entire 6 weeks.

**You should begin every week by reading the Weekly Overview.** This will inform you of the material we will cover that week; the assignments you will need to complete; as well as any pertinent information regarding Stat Lab, Teams availability, and other information I may need to convey to you. **Always read the Weekly Overview**.

**Attendance**

No attendance will be taken other than the First Day Attendance. This will take place in the form of a Syllabus Quiz (for no grade) that will be present in Module 1. Students who do not complete this quiz by the first day of class will be dropped from the course.

**Document Signatures**

If you at any time during the semester require the instructor's signature on a document, you will need to submit the document virtually via DocuSign (look under the Business Systems tab on the MyUSF homepage)

**Communication**

I will communicate with you via Canvas messaging and announcements. It is important that you check Canvas on at least a daily basis. **If you don't read the announcements, you will very likely miss important information!**

When you have a question, please first refer to the syllabus, the Weekly Overview, and recent announcements. If your question is still unanswered, message me through Canvas and I will respond as quickly as possible.

**Office Hours**

I am available to meet with students in person in my office on campus by appointment. In addition, I will host a weekly Teams discussion open to all students. Teams availability for that week will be posted in the Weekly Overview.

**Late Work**

Late assignments will not be accepted and tests cannot be made up. This class moves at a fast pace and it's important that you not fall behind. You have a full week to complete the work for each module; don't wait until the last minute.

**Cheating** The policy for this course for students caught cheating is as follows: **At minimum, the student will receive a 0 on the relevant assignment and be prevented from dropping the course. At maximum, the student will receive an FF course grade and the case will be turned over to USF for further action.** (*See USF Regulation-3.026, Academic Integrity of Students* and last page of syllabus). Falsifying documents (e.g., excuse letters, doctor's notes, etc.) will be treated as cheating. Assisting another student with quizzes or exams or sharing your work with other students for them to submit as their own constitutes cheating. THERE ARE NO EXCEPTIONS TO THIS POLICY!

**Extra Credit and Grade Adjustment**

I do not offer extra credit, but I do allow you to drop your lowest test grade and your lowest assignment grade (assuming you complete all work). There will be no curving of grades, however, if the final course average is below 75%, points will be added to each student's score until the course average is 75%. Lastly, I round final course grades up or down to the nearest whole number (89.4 becomes 89; 89.5 becomes 90).

**STAT LAB**

Stat Lab is a tutoring service offered by the TAs. This is available via Teams. Scheduling and further details regarding Stat Lab will be posted under the Resources Module in Canvas. You are highly encouraged to utilize this excellent resource! The TAs are highly knowledgeable and are there to help you succeed in this class.

## ASSIGNMENTS

You are required to complete a weekly test. You will be allowed to drop the lowest of these test grades, but if you miss one you may not make it up and that will be your dropped grade. You have the entire week to take the test, so there is really no reason to miss one. Be sure to add this to your calendar so you don't forget, and don't wait until the last minute in case something comes up. You will also complete a weekly homework assignment, some of which will be for completion only, and you will be allowed to drop the lowest of these scores. The due dates and times of these assignments can be found in the Course Schedule. **Any changes will be noted in a Canvas announcement, so make sure to read the course announcements daily.**

**Tests**

You are required to complete **five of six tests**, each worth 30 points for a total of **150** points. Only the **top 5 of your 6 test grades will be included in your grade** at the end of the semester**.** Test questions will usually be multiple choice and true/false, but other formats may sometimes be included (you will receive advance notice of this). **Tests MUST be taken by Saturday at 11:59pm.** Tests will be open in Canvas for the entire week and you may take the quiz at any point during this time. You are allowed only one attempt for each test and late tests will not be administered under any circumstances.

**Homework**

You are required to complete **five out of six homework assignments**, worth a total of **150** points total. Each homework assignment must be typed and submitted in Canvas as a **SINGLE** .doc or .docx file by the assignment's respective due date. We do not grade submissions consisting of several separate files. Hand-written work will not

be accepted. Some homework assignments will be submitted via Turnitin to assess for plagiarism. All homework assignments are due by Saturday at 11:59pm. Late homework assignments will not be accepted. **It is your responsibility to make sure you submit your homework on time in the proper format.** If you submit the incorrect file or submit a document that is unreadable, you will be allowed to resubmit but will be assessed a 25% penalty. **Check the document you are submitting to make sure it is the correct one!**

## Grading

A total of **300** points can be earned in this course (**150** points for the exams plus **150** points for homework). To obtain your percentage grade, just divide your total points earned by 300. Grades will be assigned as follows:

| Percentages | Points | Letter | Percentages | Points | Letter |
|---|---|---|---|---|---|
| 97.00-100.0 | 388-400.00 | A+ | 77.00-79.99 | 308-319.99 | C+ |
| 93.00-96.99 | 372-387.99 | A | 73.00-76.99 | 292-307.99 | C |
| 90.00-92.99 | 360-371.99 | A- | 70.00-72.99 | **280**-291.99 | C- |
| 87.00-89.99 | 348-359.99 | B+ | 67.00-69.99 | 268-279.99 | D+ |
| 83.00-86.99 | 332-347.99 | B | 60.00-66.99 | 240-267.99 | D |
| 80.00-82.99 | 320-331.99 | B- | 00.00-59.99 | 000-239.99 | F |

## USF GUIDELINES AND POLICIES

**University Policy On Academic Dishonesty** Each individual is expected to earn his or her degree on the basis of personal effort. Consequently, any form of cheating on examinations or plagiarism on assigned papers constitutes unacceptable deceit and dishonesty. This cannot be tolerated in the University community and will be punishable, according to the seriousness of the offense, in conformity with this rule. More information about the policies regarding academic dishonesty can be obtained from http://www.ugs.usf.edu/policy/AcademicIntegrityOfStudents.pdf

Cheating is defined as follows: (a) the unauthorized granting or receiving of aid during the prescribed period of a course-graded exercise: students may not consult written materials such as notes or books, many not look at the paper of another student, nor consult orally with any other student taking the same test; (b) asking another person to take an examination in his or her place; (c) taking an examination for or in place of another student; (d) stealing visual concepts, such as drawings, sketches, diagrams, musical programs and scores, graphs, maps, etc. and presenting them as one's own; (e) stealing, borrowing, buying, or disseminating tests, answer keys or other examination material except as officially authorized, research papers, creative papers, speeches, etc.; (f) stealing or copying of computer programs and presenting them as one's own.

**University Statement on Delivery of Instruction in event of Emergency** In the event of an emergency, it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include but are not limited to: CANVAS, Elluminate, Skype, and email messaging and/or an alternate schedule. It's the responsibility of the student to monitor CANVAS site for each class for course specific communication, and the main USF, College, and department websites, emails, and MoBull messages for important general information.

**Final Examinations Policy** All final examinations are to be scheduled in accordance with the University's final examination policy. http://www.ugs.usf.edu/policy/FinalExams.pdf

**General Attendance Policy** Information about the general attendance policy at USF may be obtained from the following link: http://www.ugs.usf.edu/policy/GeneralAttendance.pdf

**Early Notification Requirement for Observed Religious Days** "No student shall be compelled to attend class or sit for an examination at a day or time prohibited by his or her religious belief. In accordance with the University policy on observance of religious holy days, students are expected to notify their instructors if they intend to be absent for a class or announced examination prior to the scheduled meeting." Students must provide notice of the date(s) to the instructor, in writing, at the beginning of the term. http://www.ugs.usf.edu/policy/ReligiousDays.pdf

**Disruption of the Academic Process** Information about this policy may be obtained from the following link: http://www.ugs.usf.edu/policy/DisruptionOfAcademicProcess.pdf

**Student Academic Grievance Procedures** Information about the policies regarding student academic grievance procedures may be obtained from the following link: http://www.ugs.usf.edu/policy/StudentAcademicGrievanceProcedures.pdf

**Students with Disabilities** Students with disabilities are responsible for registering with Students with Disabilities Services (SDS) in order to receive academic accommodations. SDS encourages students to notify instructors of accommodation needs at least 5 business days prior to needing the accommodation. A letter from SDS must accompany this request. *Contact SDS at 813-974-4309 or www.sds.usf.edu*

**Grades of "incomplete"** The current university policy concerning incomplete grades will be followed in this course. Incomplete grades are given only in extreme situations where unexpected emergencies prevent a student from completing the course and the remaining work can be completed in the next semester. Your instructor is the final authority on whether you qualify for an incomplete. Incomplete work must be finished by the end of the subsequent semester. If work is not finished by this deadline university policy is that the "I" automatically reverts to an "F".

**Sexual misconduct/sexual harassment** USF is committed to providing an environment free from sex discrimination, including sexual harassment and sexual violence (USF System Policy 0-004). The USF Center for Victim is a confidential resource where you can talk about incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. This confidential resource can help you without having to report your situation to either the Office of Student Rights and Responsibilities (OSSR) or the Office of Diversity, Inclusion, and Equal Opportunity (DIEO), unless you request that they make a report. Please be aware that in compliance with Title IX and under the USF System Policy, educators must report incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence.

If you disclose any of these situations in class, in papers, or to me personally, I am required to report it to OSSR or DIEO for investigation. Contact the USF Center for Victim Advocacy and Violence Prevention: (813) 974-5757.

## COURSE SCHEDULE

| Week | Dates | Lectures | Chapters | Topics | Due This Week by Saturday at 11:59pm |
|---|---|---|---|---|---|
| 1 | May 15-19 | 1, 2 | 1, 2, 3 | Syllabus Overview and QMB 2100 Review | **Syllabus Quiz must be taken on Monday, May 15th!** Test 1 Homework 1 |
| 2 | May 22-26 | 3, 4 | 9 | Hypothesis Testing | Test 2 Homework 2 |
| 3 | May 19-June 2 | 5, 6 | 10 | Analysis of Variance | Test 3 Homework 3 |
| 4 | June 5-9 | 7, 8 | 11, 12 | Regression Analysis | Test 4 Homework 4 |
| 5 | June 12-16 | 9, 10 | 12 | Model Building | Test 5 Homework 5 |
| 6 | June 19-23 | 11, 12 | 12 | Further Regression Topics and Time Series Forecasting | Test 6 Homework 6 |

This syllabus is subject to change at any time with notice.