Course ID:	Course Title:	Fall 2021
STA 220	Introduction to Business Statistics II	Prerequisite: STA 210
		Credits: 3

Class Information		Instructor Information		Important Dates	
Delivery:	In Class	**Instructor:**	John Wiest, M.Sc.	**First Day of Classes:**	September 8, 2021
Days:	Tue/Thu	**Email:**	jwiest@ambrose.edu	**Last Day to Add/Drop:**	September 19, 2021
Time:	1:30 PM – 2:45 PM	**Phone:**	(403)410-6915	**Last Day to Withdraw:**	November 22, 2021
Room:	L2084	**Office:**	L2115	**Last Day to Apply for Extension:**	November 23, 2021
Lab/ Tutorial:	Mon: 1:00PM – 2:30 PM, A2133	**Office Hours:**	Tues: 10AM – Noon, or pop by	**Last Day of Classes:**	December 13, 2021
Final Exam:	None				

Important Dates and Information

For a list of all important dates and information regarding participating in classes at Ambrose University, please refer to the Academic Calendar at https://ambrose.edu/academic-calendar .

MIDTERM Assignment due: October 28, 2021. (These dates are subject to change based on class consensus)
FINAL Assignment due: December 17, 2021.

Course Description

Students will deepen their skills in data analysis and decision making under uncertainty using quantitative methods. Emphasis centers on regression analysis, modeling, time series forecasting, nonparametric methods, and statistical process control. Optimization modeling, simulation modeling, and data mining will also be introduced. These tools will be used in the context of business data and examples. Prerequisite: STA 210, or BHS 310, or BIO 310.

Expected Learning Outcomes

- Demonstrate knowledge of regression analysis, modeling, time series forecasting, nonparametric methods, and statistical process control.
- Develop a basic understanding of optimization modelling, simulation modeling, and data mining.
- Analyze the advantages and drawbacks of different quantitative methods; demonstrate ability to apply statistical methods in a business context

- Show knowledge of computer-based statistical analysis and Excel spreadsheets, be able to choose and apply right tools while provide their statistical analysis
- Interpret the results of statistical analyses and spreadsheets outputs, draw conclusions to make decisions under uncertainty

Textbooks

Bowerman, Bruce L., Drougas, Anne M., Duckworth, William M., Froelich, Amy G., Hummel, Ruth M., Moninger, Kyle B., Schur, Patrick J. (2019), ***Business Statistics and Analytics in Practice (9th Edition)***, McGraw Hill, New York, NY, ISBN: 978-1-260-18749-6

Note, you are not required to get a paper version of this textbook. The assignments for our class will be posted online through our course ***Connect*** page. When you purchase access to the course ***Connect*** page you will also be given access to an e-book copy of the course textbook.

Course Schedule

Part 1: Experimental Design

- Experimental Design & Analysis of Variance (ANOVA)
    - Basic Concepts of Experimental Design
    - One-Way Analysis of Variance
    - The Randomized Block Design
    - Two-Way Analysis of Variance Review
- Multinomial Data & Chi-Square Tests
    - The Multinomial Experiment
    - Chi-Square Goodness of Fit Tests
    - A Chi-Square Test for Independence

Part 2: Regression Analysis: Simple Regression

- Using Simple Regression to Describe a Linear Relationship
- Model Assumptions and the Standard Error
- Testing the Significance
- Confidence and Prediction Intervals
- Simple Coefficients of Determination and Correlation
- Residual Analysis

Part 3: Regression Analysis: Multiple Regression

- Using Multiple Regression to Describe a Linear Relationship
- Model Assumptions and the Standard Error
- Testing the Significance
- Confidence and Prediction Intervals
- Multiple Coefficients of Determination and Correlation
- Multiple Regression and Model Building

Part 4: Time Series Analysis and Forecasting

- Time Series Patterns
- Forecast Accuracy
- Time Series Analysis and Forecasting Modeling:

- Moving Averages
- Exponential Smoothing
- Trend Projection
- Seasonality and Trend
- Time Series Decomposition

Part 5: Special Topics

- Statistical Methods for Quality Control
  - Quality: Philosophies and Frameworks
  - Statistical Process Control
  - Control Charts
  - Acceptance Sampling
- Introduction to Decision Analysis
- Optimization and Simulation Modeling
- Non-Parametric Methods
- Data Mining

Requirements:

All students will be required to gain access to our course ***Connect*** page. You can access the page at https://connect.mheducation.com/class/w-john-fall-2021. When you first go to this website, you will need to create an account with Login and password. It will then give you the option to purchase your course access for CAD$82.00. The course assignments will be accessible through this website only, so getting this access is essential.

All students will need a laptop able to access Microsoft Excel. Much of the coursework in this class requires the student to be able to do lengthy computations which would be very difficult to do by hand, or even with a typical statistical calculator. The students will also be required to obtain the Excel Add-on *MegaStat*. Without this add-on there will be portions of the course work that you will not be able to complete (i.e. that portions that are not covered by the basic Excel package). Registration for *MegaStat* can be purchased at mhhe.com/megastat (you can click on the link in the class e-book front matter to get there, *Page xvi: Additional Resources* in the table of contents)

Attendance:

Students are expected to attend all lectures and labs to ensure success on exams, and quizzes. Students not attending lectures may find themselves missing information not covered in the textbook. Any student who is absent for an exam or misses an assignment due date should speak to the professor and, where possible, provide a doctor's note.

Grade Summary:

Online Assignments:	48%
Midterm Assignment:	20%
Final Assignment:	32%

There will be 6 online assignments to be completed over the course of the semester; these will all be accessible through the course ***Connect*** page. The Midterm and Final Assignments will be paper assignments that you will need to print out

and then complete on paper and then hand in. These assignments will have a specified time frame for completion that we will negotiate as a class as we get nearer to them.

The available letters for course grades are as follows:

Grade	Interpretation	Percentage	Grade Points
A+	Excellent	95 to 100	4.00
A		90 to 94	4.00
A-		85 to 89	3.70
B+	Good	80 to 84	3.30
B		76 to 79	3.00
B-		72 to 75	2.70
C+	Satisfactory	68 to 71	2.30
C		64 to 67	2.00
C-		60 to 63	1.70
D+	Poor	55 to 59	1.30
D	Minimal Pass	50 to 54	1.0
F	Failure	0 to 49	0.00
P	Pass		No Grade Points

Please note that final grades will be available on student registration system. Printed grade sheets are not mailed out.

Other:

Math is best learned in a participatory manner. Please come to class prepared to engage with the materials, the instructor, and your classmates. The hope is that our return to in-person learning will allow greater engagement with the concepts at play, but it is still up to you to ask questions when you're confused, try out new techniques and explore new ideas, and generally be an active learner.

Ambrose University Important Information:

Communication
All students have received an Ambrose e-mail account upon registration. It is the student's responsibility to check this account regularly as the Ambrose email system will be the professor's instrument for notifying students of important matters (cancelled class sessions, extensions, requested appointments, etc.) between class sessions.

Exam Scheduling
Students who find a conflict in their exam schedule must submit a Revised Examination Request form to the Registrar's Office by the deadline date; please consult the Academic Calendar. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; 2) the student has three final exams within three consecutive exam time blocks; 3) the scheduled final exam slot conflicts with an exam at another institution; 4) extenuating circumstances. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

Standards of Behaviour in the Classroom Setting
Learning is an active and interactive process, a joint venture between student and instructor and between student and student. Some topics covered within a class may lead to strong reactions and opinions. It is important that Students understand that they are entitled to hold contradictory beliefs and that they should be encouraged to engage with these topics in a critical manner. Committing to this type of "active learning" significantly increases the learning experience for both teacher and student, and reflects the Christian imperative to pursue truth, which lies at the heart of the Ambrose educational experience. However, active discussion of controversial topics will be undertaken with respect and empathy, which are the foundations of civil discourse in the Classroom Setting. Primary responsibility for managing the classroom rests with the instructor. The instructor may direct a student to leave the class if the student engages in any behaviour that disrupts the classroom setting. If necessary, Ambrose security will be contacted to escort the student from class. Please refer to your professor regarding their electronic etiquette expectations.

Academic Integrity
We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to acknowledge to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university. Students are expected to be familiar with the policies in the current Academic Calendar that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.

Academic Policies
It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. The academic calendar can be found at https://ambrose.edu/content/academic-calendar-2.

Privacy
Personal information (information about an individual that may be used to identify that individual) may be required as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at privacy@ambrose.edu.

Coursework Extensions
Should a request for a time extension on coursework exceed the end of the term, a *Coursework Extension Application* must be completed and submitted to the Office of the Registrar. The extension (if granted) will be recorded on the student record. Extensions are granted at the discretion of the instructor and are normally granted for 30 days beyond the last day of the term.

Normally, Course Extension Applications will be considered only when all of the following conditions are met:

- the quality of prior course work has been satisfactory;
- circumstances beyond your control, such as an extended illness or death of a family member, make it impossible for you to complete the course work on time; and
- you submit *Coursework Extension Application* to the Office of the Registrar on or before the deadline specified in the Academic Schedule.

If granted, time extensions do not excuse you from a final examination where one has been scheduled for the course.
A temporary grade of TX will be assigned until a final grade is submitted in accordance with the new deadline. A final grade of F will apply to:

- all course work submitted after the end of the semester unless a coursework extension has been granted; and all course work submitted after the revised due date provided by an approved extension to coursework.

Academic Success and Supports

Accessibility Services
Academic accommodation is provided to Ambrose students with disabilities in accordance with the Alberta Human Rights Act and the Canadian Charter of Rights and Freedoms. Provision of academic accommodation does not lower the academic standards of the university nor remove the need for evaluation and the need to meet essential learning outcomes. Reasonable accommodations are tailored to the individual student, are flexible, and are determined by considering the barriers within the unique environment of a

postsecondary institution. It can take time to organize academic accommodations and funding for disability-related services. Students with a disability who wish to have an academic accommodation are encouraged to contact Accessibility Services as early as possible to ensure appropriate planning for any needs that may include accommodations. Staff can then meet with students to determine areas to facilitate success, and if accommodations are required, ensure those accommodations are put in place by working with faculty.

Ambrose Writing Services
Ambrose Writing services provides academic support in the four foundational literacy skills—listening, speaking, reading, and writing. It also assists students with critical thinking and the research process. Throughout the academic year, students can meet with a writing tutor for personalized support, or they can attend a variety of workshops offered by Academic Success. These services are free to students enrolled at Ambrose University. Academic Success serves all students in all disciplines and at all levels, from history to biology and from theatre to theology. To learn more, please visit https://ambrose.edu/writingcentre

Ambrose Tutoring Services
Ambrose Tutoring Services provides support in specific disciplinary knowledge, especially in high-demand areas such as chemistry, philosophy, math and statistics, and religious studies. These tutors also coach students in general study skills, including listening and note-taking. During the academic year, Ambrose Tutoring Services offers drop-in tutoring for courses with high demand; for other courses, students can book a one-to-one appointment with a tutor in their discipline. These services are free to students enrolled at Ambrose University. To learn more, please visit https://ambrose.edu/tutoring.

Mental Health Support
All of us need a support system. We encourage students to build mental health supports and to reach out when help is needed.

On Campus:
- Counselling Services: ambrose.edu/counselling
- Peer Supportive Listening: One-to-one support in Student Life office. Hours posted at ambrose.edu/wellness.
- For immediate crisis support, there are staff on campus who are trained in Suicide Intervention and Mental Health First Aid. See ambrose.edu/crisissupport for a list of staff members.

Off Campus:
- Distress Centre - 403-266-4357
- Sheldon Chumir Health Care Centre - 403-955-6200
- Emergency - 911

Sexual Violence Support
All staff, faculty, and Residence student leaders have received *Sexual Violence Response to Disclosure* training. We will support you and help you find the resources you need. There is a website with on and off campus supports – ambrose.edu/sexual-violence-response-and-awareness.

Off Campus:
- Clinic: Sheldon Chumir Health Centre - 403-955-6200
- Calgary Communities Against Sexual Abuse - 403-237-5888

Note: Students are strongly advised to retain this syllabus for their records.