



ISTG 630-01: Applied Time Series and Forecasting

Professor:	David Holleran, PhD	Credit Hours:	3
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Semester/Year:	Spring 2022	Office:	SSB 308
Class Day/Time:	Thursday 6:30PM-8:30PM Saturday 1:00PM-3:00PM	Office Hours:	Google Hangout by appointment
Class Location:	Zoom Online		

Course Synopsis

This course develops the foundation of applied time series analysis and forecasting. The software package R will be employed for time series modeling and data visualization. The course culminates in a research project where an ensemble of the methods explored this semester will be employed.

Course Objectives

This course will pursue, at a minimum, to develop within the dedicated student the ability to:

- Formulate, estimate and evaluate time series regression models for description, explanation, and control;
- Understand the roles of trend and seasonality in influencing time series data;
- Understand and evaluate autocorrelation, moving average, mixed ARMA and ARIMA models;
- Understand and apply forecasting procedures such as smoothing, multiple regression modeling, and econometric models;
- Understand and apply frequency domain and spectral analyses.

Learning Outcomes

Upon completion of this course, students will be able to demonstrate mastery in the following areas:

1. Formulate and estimate time series regression models with the purpose of analyzing business problems over short-term and long-term time horizons.

2. Visualize time series data in substantively meaningful ways to examine functional form, evaluate statistical models and construct alternative models with the goal of analyzing and solving business problems.
3. Employ and evaluate walk-forward validation techniques for business forecasting.
4. Formulate and deploy an analytical protocol using an ensemble of statistical learning methods with the goal of analyzing and solving business problems.

Assessment Plan for Learning Outcomes

To assess student knowledge after completing this course, students will be able to:

1. Learning Outcome #1-#3 – Complete modules applying time series analysis and visualization procedures;
2. Learning Outcome #4 – Create and present a culminating research paper and presentation on an applied business problem using time series analysis and forecasting methods.

For each learning outcome, rubrics will be developed through a collaborative process with industry experts and DA faculty.

Required Materials

- (1) *The Analysis of Time Series: An Introduction with* R. Chris Chatfield and Haipeng Xing. 2019. Boca Raton, FL: CRC Press. ISBN 978-1-138-06613-7.

Course Expectations

Attendance will be taken at the beginning of every class meeting. The final grade for the course will not be affected by attendance, however. If you do not attend a class meeting, then it is your responsibility to obtain class lecture notes from a classmate. I will not under any circumstances provide lecture notes or tutoring for a class session missed by a student. Moreover, I will not be responsible for helping a student get “caught up” with the rest of the class if he/she is late for a class meeting. Please review the TCNJ policies concerning attendance (<http://policies.tcnj.edu/policies/digest.php?docId=9134>).

Assessment

Grades will not be given in this class; they will be *earned*. Late work is not accepted without medical documentation. A final grade for this course will be the result of:

Research Project - Stage 1	5 points
Research Project - Stage 2	10 points
Research Project - Stage 3	10 points
Research Project - Stage 4	15 points
Research Project - Stage 5	15 points
Research Project - Stage 6	25 points
<u>Research Project - Presentation</u>	<u>20 points</u>
Total Points	100 points

<u>Final Grade</u>	<u>Average Points</u>	<u>Final Grade</u>	<u>Average Points</u>
<u>A</u>	<u>94-100</u>	<u>C+</u>	<u>77-79.99</u>
<u>A-</u>	<u>90-93.99</u>	<u>C</u>	<u>74.76.99</u>
<u>B+</u>	<u>87-89.99</u>	<u>C-</u>	<u>70-73.99</u>
<u>B</u>	<u>84-86.99</u>	<u>D+</u>	<u>66-69.99</u>
<u>B-</u>	<u>80-83.9</u>	<u>D</u>	<u>60-65.99</u>

Research Project

Each student will be responsible for drafting an original paper to be completed in stages on a business topic to be assigned or approved by me using an ensemble of data preprocessing, regression analysis, time series analysis, and forecasting methods learned in this class. Written feedback via MS Word “Track Changes” will be provided on each student’s manuscript file. Inline comments will be made by me in addition to comments in the margins. I will not provide written feedback on the entire document. Comments provided will be provided by me in various parts of the drafts with the idea that the student will then identify and correct any thematic issues that surface in their writing later in the document. Each student, in other words, will editorialize their own document on the basis of the writing issues that I identify early in the document.

Course Policies and Shared Expectations

The College of New Jersey has developed shared policies that apply to all of our courses. Click [here](#) for a complete listing of these policies. In addition, here is a link to the [Graduate Bulletin](#) where you can find contact information and services regarding graduate education. Here are policies designed for this course.

Academic Integrity

You are responsible to know the Academic Integrity policy published by the college. You may only represent work that is their own. Cheating on tests, failing to cite sources, or submitting someone else’s work are just a few examples that may result in failing the entire course or dismissal from the college. In addition to academic performance, you are expected to demonstrate the qualities of honesty and integrity. All submissions by you or your team are expected to be your original work. Material that, in any way, violates this principle, or any form of dishonesty, cheating, fabrication, the facilitation of academic

dishonesty, and/or plagiarism, may result in you receiving a failing grade for the assignment, quiz, test, or the course. In addition, further appropriate disciplinary action may be initiated.

<https://academicintegrity.tcnj.edu/>

Attendance

During the weeks where we do not have scheduled Saturday classes, plan to attend weekly synchronous lectures. You are expected to attend all classes and lectures in their entirety. Dates are provided in the course schedule. If you must miss a class, send an email to me beforehand stating the reason for missing it. I realize you work full-time and may be pulled away from this program because of it, but those occasions should be rare. At times, you will also be expected to attend team meetings. These meeting times should be scheduled by your student team at a time that works for all of you. [TCNJ's Attendance Policy](#)

Contact Information

The best way to contact me is through the Canvas Inbox. Notification is quick and your message won't get mixed up with other email. I will respond to you within one business day. You can also call my office at (609) 771-3366 or the School of Business office at (609) 771-3063.

Course Evaluations

I believe in continuous improvement and I learn about potential improvements from your course evaluations. At the end of the semester, you are expected to complete an evaluation for this course. Please take the time for this task and provide textual feedback whenever you can.

Exam & Quizzes

Unless there is a take-home exam, you will generally complete exams when you come to class on a Saturday. If you miss a scheduled exam for legitimate reasons and you have my permission to complete the exam late, you then need to contact the MBA Director, Chanelle Lester, to schedule an on-campus appointment. At times, you may be asked to complete a quiz at home through the Canvas system. These quizzes are not monitored by a third party. We do expect you to abide by our Academic Integrity Standards at the college and to honor the requirements for any quiz. Students are responsible for being present for all exams as scheduled by the college. TCNJ's final examination policy is available on the web: <https://policies.tcnj.edu/?p=266>

Faculty Schedule & Availability

There will be time towards the end of our weekly virtual meeting and our scheduled Saturday meetings to talk. You can also schedule a personal Zoom (or Google Hangout) meeting during weekdays. Send me an email through the Canvas Inbox suggesting a date and time to speak with you.

Getting Technical Support

For problems with course projects, contact me through the Canvas Inbox. For immediate problems with campus systems, contact the Help Desk (<https://tcnj.teamdynamix.com/TDClient/Home/>) or send an email describing technical issue to mbahelp@tcnj.edu.

Submitting Work

All work will be submitted through Canvas to the respective assignment. Review assignment details to determine the type of file you need to submit. Do not submit PDF files unless you are specifically asked to do so. In addition, we will be covering a great deal of material in this graduate course and you need to keep pace with the work to be successful. Unless you have arranged with me to submit work after the due date, all work must be submitted on time and in the proper format. Every additional day that your work is submitted late will reduce your grade by 5% for a total of 50% reduction.

Teams

Building relationships with your cohorts can be invaluable to you. In addition, businesses rely heavily on teams working cooperatively to work on the type of projects you learn in this course. At times, you may be assigned to work in a small team to complete an assignment. Each team member will be responsible to contribute to each group assignment and someone from that team should be assigned the role of Project Leader. Your team will be assigned virtual space in Canvas that only your team and I have access to. You can use this space to email team members, store and collaborate on team documents, develop study guides, leave messages, and document group activities and meeting times.

If you experience problems with your team, you should seek my advice quickly. I maintain the right to remove a team member or members from a group and either place them in another group or require that they complete the work independently. Students may request to be reassigned to another team during the semester. This request will be honored when reasonable and possible.

School of Business Writing Policy

Because writing is a fundamental business skill, your grade for each assignment will reflect, among other things, your ability to write, even for assignments with minimum writing. Feedback on your writing will be provided as deemed necessary and, if your writing needs improvement, you should seek help from someone who writes well or some other writing source. The responsibility to write well is yours. My responsibility is to hold you accountable for how well you write. Poor writing will be reflected in your final grade. Feedback on your writing will be provided as deemed necessary and, if your writing needs improvement, you should seek help from the Writing Center at (<https://tutoringcenter.tcnj.edu/humanities/writers-place/>), from someone who writes well, or some other writing source.

Accessibility Resource Center (ARC)

Students must be approved for any learning accommodations through ARC (arc@tcnj.edu) and share this official communication with you within the first two weeks of the semester.

Attending Online Meetings

All of our classes will be held online. To ensure that these classes run well, you need to follow these rules.

1. If you are not familiar with Zoom, go to this [link](#) and acquaint yourself with this application.
2. Be on time and, if you need to be late, notify me beforehand through the course email system. Our meeting software alerts us when someone joins a meeting so I will need to minimize the disruptions your lateness will cause in the meeting.
3. Keep your video on so that we can see you. Keep your microphone muted unless you are speaking.
4. Prepare yourself and your work area for a meeting. It should be free from external distractions (e.g., family members, pets, phones) and, if you need water, make sure you have it beforehand. Take necessary breaks before the meeting; your full attention is needed, and expected, in this class.
5. Keep a professional demeanor at all times. The tone of your voice and the words you used should be the same as if you were participating in an important business meeting. We have limited time, so your stories and discussions points need to be concise and to the point.
6. When we are having a discussion, you need to participate without dominating the conversation. All students will be expected to contribute to our meetings and be respectful of their peers' contributions. Before you speak, state your name so that your peers and I know who to respond to.
7. If you are asked to prepare a slide for a discussion, use fonts, color and layout effectively so that the slide is easy to read by others. Practice your presentation beforehand to ensure your words and ideas are easily understood by others. Readings certain facts and figures from your slide is

fine but you should not need to read it word for word.

8. When someone else is speaking, wait until they are finished before you comment or follow-up on an idea. You can raise your hand in Zoom. When I see multiple raised hands, I will generally call on you in the order the hands were raised.