COURSE INFORMATION

Course title:	Forecasting and Time Series Prediction		
Course code:	BABS 502	Credits:	1.5
Session and term:	2023W2, Period 3	Class location:	HA 337
Section(s):	BA2	Class times:	Mon./Wed. 2-4pm
Course duration:	Jan. 8 to Feb. 16, 2023	Pre-requisites:	BABS 507
Division:	Operations & Logistics	Co-requisites:	N/A

INSTRUCTOR INFORMATION

Instructor:	Martha Essak, M.Sc.		
Phone:	778-819-8368	Office location:	HA 351
Email:	martha.essak@sauder.ubc.ca	Office hours:	Mon./Wed. 12pm-1pm

COURSE DESCRIPTION

Forecasting is an integral part of decision-making activities. Organizations define goals, seek to predict environmental factors, and then take actions that they hope will result in the achievement of these goals. Forecasting allows organizations to decrease their dependence on chance and become more scientific in dealing with their environments. Today, forecasting rests on solid theoretical foundations while also having a realistic, practical base that increases its relevance and usefulness to organizations.

This course covers the full range of major forecasting methods, providing a complete description of their essential characteristics and presenting the steps needed for their practical application, while avoiding getting bogged down in the theoretical details that are not essential to understanding how the various methods work. It provides a systematic comparison of the advantages and disadvantages of various methods so that the most appropriate method can be selected for each forecasting situation.

COURSE FORMAT

Class time will consist of lectures, discussions and activities. Students will complete readings, quizzes, homework assignments, and the project outside of class time.

LEARNING OBJECTIVES

This course will:

1. Introduce students to basic forecasting concepts and to major forecasting methods.
2. Teach students a structured and objective approach to forecasting.
3. Enable students to use forecasting to address different business problems.

At the end of the course, students will be able to:

1. Appreciate the key role that forecasting plays in organizational decision-making.
2. Understand and effectively apply the full range of major forecasting methods used in practice, and appreciate their strengths and weaknesses in view of their practical application.
3. Use forecasting to derive managerial insights relevant to the intended application.
4. Use and interpret output from statistical software, and critique and interpret forecasts prepared by others.

SUSTAINABLE DEVELOPMENT GOALS (SDGS)

At UBC Sauder, we are committed to responsible business practices that can have transformative impacts on society. One of the ways we are reinforcing our commitment to responsible business is by showcasing relevant content in our courses via the lens of the United Nations Sustainable Development Goals. In this course, we will touch on topics that relate to the following goals:

Sustainable Development Goal	Description of how and when the goal is covered in the course.
Goal 7: Affordable and Clean Energy 7 AFFORDABLE AND CLEAN ENERGY	In week 1, we will visualize and forecast energy demand. A better understanding of the historical demand aids planning for interventions to reduce electricity use and planning for use of renewable energy sources for the future.
Goal 12: Responsible Consumption and Production 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	In weeks 3 and 5, we will forecast demand for electrical equipment. Forecasting demand aids in the creation of a supply chain that is sustainable and responsible toward the environment.

ASSESSMENTS

Summary

Component	Weight
Assignments	40%
Final project	40%
Quizzes	8%
Professionalism and participation	7%
Judgmental forecasting activity	5%
Total	100%

Details of Assessments

Assignments

Students will work <u>individually</u> to solve the problems in the homework assignments. Late submissions will not be accepted and will receive a zero. Homework assignments should be handed in electronically via the UBC Canvas system. Assignments will be graded on correctness and clarity.

Final project

Students will work <u>in pairs</u> on a project (in report form) that uses the techniques learned throughout the course. You may not work with classmates outside your pair or obtain outside help. Please consult with the instructor if you need help or clarification. The project will be completed in two parts (Part A and B).

Quizzes

Students will work <u>individually</u> on quizzes, which are designed to be completed after you have finished the readings about the relevant material.

Professionalism and participation
Professionalism and participation will be assessed based on: punctuality, preparation for class, participation in class activities (including iClicker), contribution to class discussions, and interaction with peers and the instructor.

Judgmental forecasting class activity
This is a class activity that students will contribute to in pairs. Each pair will be graded on their contribution to the class activity.

LEARNING MATERIALS
Required Reading Materials: "Forecasting: Principles and Practice, 2nd edition" by Hyndman and Athanasopoulos (2018). This text is available for free online at https://otexts.com/fpp2/ (Note that we are not using the 3rd edition)
Readings are indicated in the course schedule.

Required: iClicker https://www.iclicker.com/students/
Either iClicker app for iOS or Android, or can get up account through Web portal to use through browser.
Please use your student number if asked as this is essential for tracking participation.
Then add yourself to the course by searching "University of British Columbia" and "BABS 502 BA2".

Technology Requirements: Computer installed with R, RStudio, Microsoft Excel, and Anaconda (Jupyter Notebook).
R: http://www.r-project.org
RStudio: http://rstudio.org/download/

Estimated cost of required materials: $0
Additional materials recommended but not required: N/A

COURSE-SPECIFIC POLICIES AND RESOURCES
Missed or late assignments, and regrading of assessments
Late submissions will not be accepted and will receive a grade of zero.

Academic Concessions
If extenuating circumstances arise, please contact the RHL Graduate School program office as early as reasonably possible, and submit an Academic Concession Request & Declaration Form. If an academic concession is granted during the course, the student will be provided options by RHL, or by the instructor in consultation with RHL, per UBC's policy on Academic Concession.

Code Plagiarism
Code plagiarism falls under the UBC policy for Academic Misconduct. Students must correctly cite any code that has been authored by someone else or by the student themselves for other assignments. Cases of "reuse" may include, but are not limited to:
- the reproduction (copying and pasting) of code with none or minimal reformatting (e.g., changing the name of the variables)
- the translation of an algorithm or a script from a language to another
- the generation of code by automatic code-generations software

An "adequate acknowledgement" requires a detailed identification of the (parts of the) code reused and a full citation of the original source code that has been reused.

Students are responsible for ensuring that any work submitted does not constitute plagiarism. Students who are in any doubt as to what constitutes plagiarism should consult their instructor before handing in any assignments.

POLICIES APPLICABLE TO COURSES IN THE ROBERT H. LEE GRADUATE SCHOOL

Attendance

Excepting extenuating circumstances, students are expected to attend 100% of their scheduled class hours. Absent students limit their own academic potential, and that of their classmates, and cause unnecessary disruption to the learning environment. Students missing more than 20% of the total scheduled class hours for a course (including classes held during the add/drop period) without having received an academic concession will be withdrawn from that course. Withdrawals, depending on timing, could result in a "W" or an "F" standing on the transcript.

Punctuality

Students are expected to arrive for classes and activities on time and fully prepared to engage. Late arrivals may be refused entry at the discretion of the instructor or activity lead. Students arriving later than halfway through a scheduled class will be treated as absent for that class.

Electronic Devices

Devices such as laptops, tablets, and cell phones are not permitted to be used in class unless directed by the instructor for in-class activities. Students who do not follow the School's policy in this regard may be required to leave the room for the remainder of the class, so that they do not distract others. Research shows that students' use of laptops in class has negative implications for the learning environment, including reducing their own grades and the grades of those sitting around them.

Citation Style

Please use the American Psychological Association (APA) reference style to cite your sources.

Details of the above policies and other RHL Policies are available at:
http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,199,506,1625

UNIVERSITY POLICIES AND RESOURCES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the UBC Senate website at https://senate.ubc.ca/policies-resources-support-student-success.

Respect for Equity, Diversity, and Inclusion

The UBC Sauder School of Business strives to promote an intellectual community that is enhanced by diversity along various dimensions including Indigeneity (including identification as First Nation, Métis, or Inuit), race, ethnicity, gender identity, sexual orientation, religion, political beliefs, social class, and/or disability. It is critical that students from diverse backgrounds and perspectives be valued in and well-served by their courses. Furthermore, the diversity that students bring to the classroom should be viewed as a resource, benefit, and source of strength for your learning experience. It is expected that all students and members of our community conduct themselves with empathy and respect for others.

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

Use of Artificial Intelligence

Generative AI (Including ChatGPT) Not Permitted

Any work submitted must be your own original work, written without outside assistance or collaboration. Any use of generative artificial intelligence (AI), including ChatGPT, is not permitted and constitutes academic misconduct. Any student suspected of submitting work that includes AI generated content may be asked for preliminary work or other materials to evidence the student's original and unaided authorship. The student may also be asked to separately explain or support their work. AI identification methods may also be employed by the instructor. After review, if it is determined by the instructor that submitted work likely contains AI generated content, the work may receive a zero and may be subject to further misconduct measures set out in the UBC Academic Calendar.

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ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (Musqueam) people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

COURSE SCHEDULE

(Subject to change with class consultation)

Class	Date	Topic	Readings or Activities	Assessments due
1	Jan. 8	Course Overview, Introduction to Forecasting	Ch. 1 – 4	Quiz #1 Due Mon. Jan. 8 at 11:59 pm
2	Jan. 10	Basic Forecasting Methods		Judgmental forecasting class activity Due Thurs. Jan. 11 at 11:59pm
3	Jan. 15	Time Series Decomposition	Ch. 6	Quiz #2 Due Mon. Jan. 15 at 11:59pm
4	Jan. 17	Time Series Decomposition		**Assignment 01**: Basic Forecasting methods Due Wed. Jan. 17 at 11:59pm
5	Jan. 22	Exponential Smoothing Methods	Ch. 7	Quiz #3 Due Mon. Jan. 22 at 11:59pm
6	Jan. 24	Exponential Smoothing Methods		**Assignment 02**: Time Series Decomposition Due Wed. Jan. 24 at 11:59pm
7	Jan. 29	ARIMA Models	Ch. 8	Quiz #4 Due Mon. Jan. 29 at 11:59pm
8	Jan. 31	ARIMA Models		**Assignment 03**: Exponential Smoothing Methods Due Wed. Jan. 31 at 11:59pm **Final Project Part A** Due Fri. Feb. 2 at 11:59pm
9	Feb. 5	Explanatory models	Ch. 5	
10	Feb. 7	Explanatory models		**Assignment 04**: ARIMA models Due Wed. Feb. 7 at 11:59pm
	Feb. 12-16	Final exam week		**Final Project Part B deadline TBA**