

COURSE INFORMATION

Course title:	Forecasting and Time Series Prediction		
Course code:	BABS 502	Credits:	1.5
Session, term, period:	2021W2, Period 4	Class location:	HA 337
Section(s):	BA1	Class times:	Mon/Wed 4-6PM
Course duration:	February 28 – April 9, 2022	Pre-requisites:	N/A
Division:	Operations and Logistics	Co-requisites:	N/A
Program:	MBAN		

INSTRUCTOR INFORMATION

Instructor:	Katherine Sunderland, MPH		
Phone:	604-842-7807	Office location:	HA 531
Email:	Katherine.sunderland@sauder.ubc.ca	Office hours:	By appointment

Teaching assistant:	Karthik Narayanan		
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COURSE DESCRIPTION

Organizations depend on forecasts to drive myriad aspects of decision-making. Accurate forecasts, based on solid theoretical foundations, applied in a practical way, enable organizations to create more efficient and effective processes. This course will focus on the practicalities of common forecasting methods, describing their use and providing practice in their application. Given students' background in BABS 507 and BABS 508, there will be less of an emphasis on theory in this course and more of an emphasis on practice with forecasting and time series methods.

COURSE FORMAT

Class time will consist of lectures, discussions, and activities. Students will complete readings, questions, quizzes, and the group project outside of class time. Respect and professionalism is expected in all interactions related to the course both inside and outside the classroom.

LEARNING OBJECTIVES

By the end of this course, students will be able to:

1. Articulate how forecasting can be used to inform organizational decision-making
2. Employ major forecasting methods used in practice
3. Contrast and compare the strengths and weaknesses of forecasting methods in view of their practical application
4. Interpret forecasts prepared by themselves and others
5. Use R code to employ forecasting to derive insights relevant to the intended goal
6. Work in groups to prepare forecasts

ASSESSMENTS

Summary

<u>Component</u>	<u>Weight</u>
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Class prep questions (5)	15%
Quizzes (5)	30%
Group Project (2 deliverables)	45%
Attendance and participation	<u>10%</u>
Total	<u>100%</u>

Details of Assessments

Class prep questions (15%)

Some classes have a prep question due at the beginning of class and will be posted and submitted on Canvas. These must be completed individually.

Quizzes (30%)

Quizzes 1-4 will each be worth 5% and the final quiz #5 will be worth 10%. Students will work individually on the quizzes, which will be hosted on canvas.

Group Projects (45%)

Students will work in groups of 3-4 students to prepare and interpret forecasts in the form of reports. Students will be allowed to choose their own groups. Groups for the projects will be formed by the end of Mar 6, 2022 at 11:59 pm PT. Each group should select a group leader who will set up your group in Canvas – details will be posted on Canvas. If you have problems finding a group, please email the instructor.

There are 2 deliverables for this project. For each deliverable, 5% of the grade will be based on a peer assessment of your participation in the group. The peer assessment will be done using iPeer – details will be posted on Canvas.

Deliverable #1 (20% weight):

- Due on Sunday March 20 at 11:59 pm PT

Student teams will choose a dataset to perform analyses using basic forecasting methods and time series decomposition. The group leader will submit the assignment electronically through Canvas on behalf of the group.

Deliverable #2 (25% weight):

- Due date TBD

Student teams will choose a dataset to perform analyses using exponential smoothing methods and ARIMA models.

Students are expected to work together in a professional manner. Students are encouraged to manage conflict themselves, but the instructor is available to help if necessary.

Class Participation (10%):

Participation will be assessed based on professionalism. This includes getting to class on time, participation in class activities and discussions, and professional and respectful interactions with students and the instructor in all topics related to the course, both inside and outside of class.

LEARNING MATERIALS

Required Reading Materials: “Forecasting: Principles and Practice, 2nd edition” by Hyndman and Athanasopoulos (2018).

This text is available for free online at the library and at <https://otexts.com/fpp2/>

Required statistical software:

R or RStudio will be required these can be downloaded for free at the following websites:

Download R at: <https://cran.r-project.org/>

Download RStudio at: <https://rstudio.com/products/rstudio/download/>

Required learning technologies:

- Canvas (course site)
- iPeer
- iClicker Cloud (see below)

Use of iClicker Cloud for Class Participation Assessments:

iClicker Cloud will be used for taking attendance and for student polls.

Follow the link for instructions on setting up iClicker Cloud for Students:

<https://lthub.ubc.ca/guides/iclicker-cloud-student-guide/>

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](https://webforms.sauder.ubc.ca/academic-concession-rhlee) <https://webforms.sauder.ubc.ca/academic-concession-rhlee>. 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](#).

Other Course Policies and Resources

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.

COVID-19 Policies for Attendance & Academic Concessions:

If a student feels unwell, they should stay home and send a courtesy email to each impacted instructor and cc their program manager. The student should also submit an [Academic Concession Request & Declaration Form](#).

If a student suspects possible COVID-19 infection, they should use the BC Ministry of Health’s [self-assessment tool](#), to help determine whether further assessment or testing for COVID-19 is recommended.

If a student is required to self-isolate (e.g., while waiting for test results), they should follow the steps above (stay home, email instructor(s) and program manager, submit an [Academic Concession Request & Declaration Form](#), and follow BC Health Guidance.

Students who are required to quarantine, should get in touch with their Program Manager to discuss the possibility of academic concessions for each impacted course. The Program Manager will work closely with your instructors to explore options for you to make up the missed learning.

COVID-19 Safety in the Classroom:

Masks: Masks are **required** for all indoor classes, as per the BC Public Health Officer orders. For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. For the purposes of this order, the term “masks” refers to medical and non-medical masks that cover our noses and mouths. Masks are a primary tool to make it harder for COVID-19 to find a new host. You will need to wear a medical or non-medical mask for the duration of our class meetings, for your own protection, and the safety and comfort of everyone else in the class. You may be asked to remove your mask briefly for an ID check for an exam, but otherwise, your mask should cover your nose and mouth. Please do not eat in class. If you need to drink water/coffee/tea/etc, please keep your mask on between sips. Students who need special accommodation are asked to discuss this with the program office.

Seating in class: To reduce the risk of COVID-19 transmission, please sit in a consistent area of the classroom each day. This will minimize your contacts and will still allow for the pedagogical methods planned for this class to help your learning.

Visit the following website for the most recent updates regarding COVID-19 protocol on campus:
<https://students.ubc.ca/campus-life/returning-to-campus>

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

In-Person Regulations

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.

On-Line Lecture Regulations

During online lectures, students are not permitted to use any electronic devices other than the primary one used for attending the online lecture (e.g. laptop or desktop). Only Zoom should be open during the online lecture unless an instructor advises the use of another program/website for an in-class activity. Feedback from students indicates that personal devices are the number one distraction from effective learning and participation in the online learning environment.

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 status as a First Nation, Metis, Inuit, or Indigenous person, 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.

Academic Freedom and Students Studying from Outside Canada

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC, including changes to health and safety considerations. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities (please visit <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,33,86,0> for an articulation of the values of the University conveyed in the Senate Statement on Academic Freedom). Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses. For further information and support, please visit: <http://academic.ubc.ca/support-resources/freedom-expression>

COPYRIGHT

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the instructor or licensed to be used in this course by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline and could be subject to legal action. Any lecture recordings are for the sole use of the instructor and students enrolled in the class. In no case may the lecture recording or part of the recording be used by students for any other purpose, either personal or commercial. Further, audio or video recording of classes are not permitted without the prior consent of the instructor. Students may not share class Zoom links or invite others who are not registered to view sessions.

ACKNOWLEDGEMENT

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

ONLINE TEACHING TOOL & REQUIREMENTS

This course might be taught using Zoom for synchronous classes and office hours.

For this course, you might be required to use a Zoom account during synchronous classes and office hours. If you do not have a Zoom account, you can create one here: <https://zoom.us/signup>. Note: creating a Zoom account requires that you provide a first name, last name, and email address to Zoom. For privacy purposes, you may consent to using your existing email address and your real name. Alternatively, if you prefer, you may sign up using an alternative email address and an anonymized name that does not identify you (i.e. Jane Doe, jane.doe@email.com). If you have trouble creating an account, or accessing a Zoom session, please contact CLCHelp@sauder.ubc.ca. You will be required to provide the email address associated with your Zoom account in a Canvas quiz for identification purposes.

To help replicate the classroom experience, make sessions more dynamic and hold each person accountable, both students and instructors are required to have their cameras on during Zoom sessions. Students who require an accommodation with regard to the “camera on” requirement must contact their instructors in advance of the first class to discuss options. As professional graduate students, students are expected to conduct themselves professionally by joining sessions on time, muting mics when not speaking, refraining from using any other technology when in-session, attending in business casual dress (at a minimum), and participating from a quiet environment. Content from synchronous sessions will be selectively recorded per instructor discretion and made available to students on Canvas for a maximum duration of the course length. This is done to allow students the opportunity to return to lecture content to solidify learnings.

COURSE SCHEDULE

Class	Date	Topic	Readings or Activities	Assessments due
1	February 28, 2022 (Mon)	Introduction to forecasting	Ch 1-4 in Forecasting: Principles and Practice	Prep question #1 Due Mon Feb 28, 2022 at 8:00 am PT
2	March 2, 2022 (Wed)	Basic forecasting methods		Group project groups must be formed by Sun Mar 6, 2022 at 11:59 pm PT
3	March 7, 2022 (Mon)	Time series decomposition	Ch 6 in Forecasting: Principles and Practice	Prep question #2 Due Mon Mar 7, 2022 at 8:00 am PT Quiz #1 Due Mon Mar 7, 2022 at 11:59 pm PT
4	March 9, 2022 (Wed)	Time series decomposition		
5	March 14, 2022 (Mon)	Exponential smoothing methods	Ch 7 in Forecasting: Principles and Practice	Prep question #3 Due Mon Mar 14, 2022 at 8:00 am PT Quiz #2 due Mon Mar 14, 2022 at 11:59 pm PT
6	March 16, 2022 (Wed)	Exponential smoothing methods		Group project deliverable #1 due Sun Mar 20, 2022 at 11:59 PM
7	March 21, 2022 (Mon)	ARIMA Models	Ch 8 in Forecasting: Principles and Practice	Prep question #4 Due Mon Mar 21, 2022 at 8:00 am PT Quiz #3 due Mon Mar 21, 2022 at 11:59 pm PT
8	March 23, 2022 (Wed)	ARIMA Models		

9	March 28, 2022 (Mon)	Simple and multiple regression	Ch 5 in Forecasting: Principles and Practice	Prep question #5 Due Mon Mar 28, 2022 at 8:00 am PT Quiz #4 due Mon Mar 28, 2022 at 11:59 pm PT
10	March 30, 2022 (Wed)	Topics related to the group project		Quiz #5 due Sat Apr 2, 2022 at 11:59 pm PT
	April 5-9, 2022	Exam Week		Group project final deliverable – To be scheduled by RHL Office