



THE UNIVERSITY OF BRITISH COLUMBIA

Department of Computer Science, Mathematics, Physics and Statistics  
Okanagan Campus

## DATA 315 Applied Time Series and Forecasting W2021 – T-2

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**Instructor:** Lengyi Han                      **E-mail:** lengyi.han@ubc.ca  
**Classroom Schedule:** Monday and Wednesday 8:00-9:30  
**Location:** On-line Canvas  
**Office Hours:** Wednesday 9:30-10:30 or by Appointment  
**Course Website:** Canvas  
**TA Name:** Ladan Tazik                      **TA E-mail:** ladan.tazik@ubc.ca

### Calendar Course Description

#### DATA 315 (3) Applied Time Series and Forecasting

Trends, stationary and nonstationary time series models, forecasting, seasonal models. [3-1-0]

Prerequisite: STAT 230.

### Materials Required

**Textbook:** Notes will be posted on Canvas

**Reference Book:** Woodward, Gray and Elliott. (2012) *Applied Time Series Analysis*, Boca Raton, CRC Press.

**Software:** R or R Studio

**Homepage:** <https://www.r-project.org>, <https://www.rstudio.com> and

**Download page:** <https://cran.r-project.org>,  
<https://www.rstudio.com/products/rstudio/download/>

### Course Overview:

This course will cover standard topics in models of time series and statistical inference for these models. Topics will include probability and linear algebra review for time series, moving average process, autoregressive process, general linear process and introduction to advanced time series models.

### Learning Outcomes:

The successful student will, using modern software, be able to fit a model to time series data and be able to critically access the appropriateness of the model.



## Evaluation

**Quizzes:** There will be 5 quizzes online. Each quiz will be open until one hour before the **final exam**. You can try the quizzes as many times as you want and we will use the highest mark for you. The schedule is tentative. Posting time will be adjusted based on the actual pace of the course.

Quiz 1	In the week of Jan 17
Quiz 2	In the week of Jan 31
Quiz 3	In the week of Feb 14
Quiz 4	In the week of Mar 14
Quiz 5	In the week of Mar 28

**Midterm Exam:** The midterm exam will be two hours and will be held online. You can choose any two hours to finish your test during the open period. It will be scheduled as below:

Test	Open	Close
Midterm exam	8:00 am on Feb 27	11:59 pm on March 1

**Assignments:** There will be 5 assignments. They will be scheduled tentatively as below:

Assignment	Post
Assignment 1	In the week of Jan 17
Assignment 2	In the week of Jan 31
Assignment 3	In the week of Feb 14
Assignment 4	In the week of Mar 14



Assignment 5	In the week of Mar 28
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**Final Exam:** There will be one 2.5-hour-long final exam online. The exam will be held using browser lockdown. You will be allowed one two-sided page of formulas etc (i.e a cheat sheet or your own brief course summary). The exam time will be announced by the registrar's office.

### Evaluation Weights:

Assignments (5)	25%
Quizzes (5)	15%
Midterm Exam	25%
Final Exam	35%

Final grades will be based on the evaluations listed above and the final grade will be assigned according to the standardized grading system outlined in the UBC Okanagan Calendar.

### Policies:

Late assignment won't be accepted except you have a reasonable explanation. The weight for the assignment you miss will put in your final exam

You pass the course if you overall evaluated grade with weighted assignment, quizzes and final exam is 50 or higher.

### Grading Practices

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record.

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014>



## Final Examinations

The examination period for **W20201 T-2 is April 14 - 29, 2022**. Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 24-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges

that arise during a term and changes in the requirements of an ongoing job.

Further information on **Academic Concession** can be found under **Policies and Regulation in the Okanagan Academic Calendar** <http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0>

## 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.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at: <http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0>.

## Cooperation vs. Cheating

Working with others on assignments is a good way to learn the material and we encourage it. However, there are limits to the degree of cooperation that we will permit. Any level of cooperation beyond what is permitted is considered cheating.

When working on programming assignments, you must work only with others whose understanding of the material is approximately equal to yours. In this situation, working together to find a good approach for solving a programming problem is cooperation; listening while someone dictates a solution is cheating. You must limit collaboration to a high-



level discussion of solution strategies, and stop short of actually writing down a group answer. Anything that you hand in, whether it is a written problem or a computer program, must be written by you, from scratch, in your own words. If you base your solution on any other written solution, you are cheating. If you provide your solution for others to use, you are also cheating.

## Copyright Disclaimer

Diagrams and figures included in lecture presentations adhere to Copyright Guidelines for UBC Faculty, Staff and Students <http://copyright.ubc.ca/requirements/copyright-guidelines/> and UBC Fair Dealing Requirements for Faculty and Staff <http://copyright.ubc.ca/requirements/fair-dealing/>. Some of these figures and images are subject to copyright and will not be posted to **Canvas**. All material uploaded to **Canvas** that contain diagrams and figures are used with

permission of the publisher; are in the public domain; are licensed by Creative Commons; meet the permitted terms of use of UBC's library license agreements for electronic items; and/or adhere to the UBC Fair Dealing Requirements for

Faculty and Staff. Access to the **Canvas** course site is limited to students currently registered in this course. Under no circumstance are students permitted to provide any other person with means to access this material. Anyone violating these restrictions may be subject to legal action. Permission to electronically record any course materials must be granted by the instructor. Distribution of this material to a third party is forbidden.

## Grievances and Complaints Procedures

A student who has a complaint related to this course should follow the procedures summarized below:

- The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor.
- If the complaint is not resolved to the student's satisfaction, the student should e-mail the Department Associate Head Dr. Heinz Bauschke at [heinz.bauschke@ubc.ca](mailto:heinz.bauschke@ubc.ca) or the Faculty of Science Associate Dean, Dr. Lael Parrott at [lael.parrott@ubc.ca](mailto:lael.parrott@ubc.ca)

## Student Service Resources

### Disability Assistance

The Disability Resource Centre ensures educational equity for students with disabilities, injuries or illness. If you are disabled, have an injury or illness and require academic accommodations to meet the course objectives, e-mail us or visit our website for more information.

**Web:** <http://students.ok.ubc.ca/drc/welcome.html>      **E-mail DRC at:** [drc.questions@ubc.ca](mailto:drc.questions@ubc.ca)

### Equity, Human Rights, Discrimination and Harassment

UBC Okanagan is a place where every student, staff and faculty member should be able to study and work in an



environment that is free from human rights-based discrimination and harassment. If you require assistance related to an issue of equity, discrimination or harassment, please contact the Equity Office, your administrative head of unit, and/or your unit's equity representative. **UBC Okanagan Equity Advisor: ph. 250-807-9291**

**Web:** <https://equity.ok.ubc.ca/>

**E-mail:** [equity.ubco@ubc.ca](mailto:equity.ubco@ubc.ca)

### **Health & Wellness - UNC 337**

At UBC Okanagan health services to students are provided by Health and Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus community. If you require assistance with your health, please contact Health and Wellness for more information or to book an appointment.

**Web:** [www.students.ok.ubc.ca/health-wellness](http://www.students.ok.ubc.ca/health-wellness)

**Email:** [healthwellness.okanagan@ubc.ca](mailto:healthwellness.okanagan@ubc.ca)

### **Sexual Violence Prevention and Response Office (SVPRO)**

A safe and confidential place for UBC students, staff and faculty who have experienced sexual violence regardless of when or where it took place. Just want to talk? We are here to listen and help you explore your options. We can help you find a safe place to stay, explain your reporting options (UBC or police), accompany you to the hospital, or support you with academic accommodations. You have the right to choose what happens next. We support your decision, whatever you decide. Visit [svpro.ok.ubc.ca](http://svpro.ok.ubc.ca) or call us at 250-807-9640

### **Independent Investigations Office (IIO)**

If you or someone you know has experienced sexual assault or some other form of sexual misconduct by a UBC community member and you want the Independent Investigations Office (IIO) at UBC to investigate, please contact the IIO. Investigations are conducted in a trauma informed, confidential and respectful manner in accordance with the principles of procedural fairness. You can report your experience directly to the IIO by calling 604-827-2060.

**Web:** <https://investigationoffice.ubc.ca/>

**E-mail:** [director.of.investigations@ubc.ca](mailto:director.of.investigations@ubc.ca)

### **The Hub**

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include **tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies.** **Web:** (<https://students.ok.ubc.ca/student-learning-hub/>) **Ph:** 250-807-9185.

**SAFEWALK** - Download the UBC SAFE – Okanagan app.

Don't want to walk alone at night? Not too sure how to get somewhere on campus?

**Call Safewalk at 250-807-8076** For more information: <https://security.ok.ubc.ca/safewalk/>