STAT8122

Time Series

Session 2, Online-scheduled-In person assessment, Exam centre within Australia 2024

School of Mathematical and Physical Sciences

Contents

General Information

Unit convenor and teaching staff
Unit Convenor/Instructor
Nan Zou
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Room 606, 12 Wally's Walk
Consultation hours: by appointment

Credit points
10

Prerequisites
((Admission to MAppStat or MSc or MScInnovation or GradCertAppStat or GradDipAppStat or MActPrac) and (STAT6110 or STAT806 or STAT810 or STAT8310)) or (Admission to BMathScMAppStat and permission by special approval)

Corequisites

Co-badged status
STAT7122

Unit description
This unit is an introduction to Time Series Analysis and Forecasting. This unit introduces methods suitable for forecasting including the decomposition of time series, exponential smoothing methods, ARIMA modelling, and regression with autocorrelated disturbances.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: provide an understanding of common statistical methods used in forecasting

ULO2: develop computer skills for forecasting time series data

ULO3: provide insights into the problems of implementing and operating large scale forecasting systems

General Assessment Information

Requirements to Pass this Unit

To pass this unit you must meet ALL of the following requirements:

- Achieve a total mark equal to or greater than 50%

Hurdle Assessments

There is no Hurdle Assessment

Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for Special Consideration.

Assessments where Late Submissions will be accepted

- Assignment 1 – YES, Standard Late Penalty applies
- Assignment 2 – YES, Standard Late Penalty applies
- Assignment 3 – YES, Standard Late Penalty applies
- Final Exam – NO, unless Special Consideration is granted

Special Consideration

The Special Consideration Policy aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the written assessments in this unit on time, please inform the convenor and submit a Special Consideration request through ask.mq.edu.au.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1	15%	No	Week 4
Assignment 2	15%	No	Week 8
Assignment 3	15%	No	Week 12

Name	Weighting	Hurdle	Due
Final Examination	55%	No	Exam Period

Assignment 1

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 10 hours
Due: **Week 4**
Weighting: **15%**

Reinforce and apply the concepts covered in lectures and the skills learned in SGTA sessions, through data analysis.

On successful completion you will be able to:

- provide an understanding of common statistical methods used in forecasting
- develop computer skills for forecasting time series data

Assignment 2

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 10 hours
Due: **Week 8**
Weighting: **15%**

Reinforce and apply the concepts covered in lectures and the skills learned in SGTA sessions, through data analysis.

On successful completion you will be able to:

- provide an understanding of common statistical methods used in forecasting
- develop computer skills for forecasting time series data
- provide insights into the problems of implementing and operating large scale forecasting systems

Assignment 3

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 10 hours
Due: **Week 12**

Weighting: **15%**

Reinforce and apply the concepts covered in lectures and the skills learned in SGTA sessions, through data analysis.

On successful completion you will be able to:

- provide an understanding of common statistical methods used in forecasting
- develop computer skills for forecasting time series data
- provide insights into the problems of implementing and operating large scale forecasting systems

Final Examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **Exam Period**
Weighting: **55%**

An invigilated final examination to be scheduled in the university examination period.

On successful completion you will be able to:

- provide an understanding of common statistical methods used in forecasting
- develop computer skills for forecasting time series data
- provide insights into the problems of implementing and operating large scale forecasting systems

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Lectures and SGTAs

There is one two-hour synchronous lecture and one one-hour SGTA each week.

Lectures begin in Week 1 and SGTAs in Week 2.

Please consult the timetable for the scheduling of these activities.

Discussion Forum & Consultation Hours:

If you have any questions on the math/programming aspects of lectures or assessments, you could either post these questions on our iLearn discussion forum or visit our office hours. The discussion forum is a platform for you and your classmates to discuss the unit with each other, although we will pop in from time to time. The office hour will be released in the upper right corner of our iLearn webpage.

Email

We will communicate with you via your university email or through announcements on iLearn. If you have any questions on the logistics part of this unit or any urgent issues, you can always email Nan at nan.zou@mq.edu.au and Nan will do his best to help.

Technologies used and required

Lecture material will be placed on iLearn. R is used throughout the unit. R is free and is extensively used for performing statistical analysis.

Textbook

Rob J Hyndman and George Athanasopoulos (2021) Forecasting: principles and practice, 3rd edition, OTexts: Melbourne, Australia.

The online version of this book could be found at https://otexts.com/fpp3/

COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: https://www.mq.edu.au/about/coronavirus-faqs. Remember to check this page regularly in case the information and requirements change during the semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

Unit Schedule

Tentatively:

Week	Topic
1	Introduction

Week	Topic
2	Time series graphics
3	Time series decomposition
4	Time series features
5	The forecaster's toolbox
6	Time series regression models
7	Exponential smoothing
8	Exponential smoothing
9	ARIMA models
10	ARIMA models
11	ARIMA models
12	Dynamic Regression models
13	Neural Network

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Assessment Procedure
- Complaints Resolution Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault

- Social support including information about finances, tenancy and legal issues
- Student Advocacy provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page.

Student feedback from the previous offering of this unit was very positive overall, with students pleased with the clarity around assessment requirements and the level of support from teaching staff. As such, no change to the delivery of the unit is planned, however, we will continue to strive to improve the level of support and the level of student engagement.

Unit information based on version 2024.01R of the Handbook