STAT3128

Market Research and Forecasting

Session 2, In person-scheduled-weekday, North Ryde 2024

School of Mathematical and Physical Sciences

Contents

General Information

Unit convenor and teaching staff
Unit Convenor, Lecturer
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12 Wally's Walk, Level 6, Room 639
See iLearn for Consultation hours.

Credit points
10

Prerequisites
20cp at 2000 level including STAT270 or STAT2170 or STAT271 or STAT2371 or BIOL235(P) or BIOL2610 or PSY222 or PSY248(P) or PSYU2248

Corequisites

Co-badged status

Unit description
Advanced quantitative methods including conjoint analysis, principal component analysis and other statistical techniques that have important applications in market research form the first part of this unit. Emphasis is placed on market research applications. The unit then covers methods for modelling and forecasting trends based on time series data, including procedures for seasonal adjustment.

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: perform an appropriate principal components analysis (PCA) and interpret the results.

ULO2: perform an appropriate Factor Analysis (FA) and interpret the results.

ULO3: perform a Conjoint Analysis (CA) and generate an orthogonal plan.

ULO4: fit an appropriate AR, MA or ARIMA time series model to data and interpret the results.

ULO5: fit an appropriate ARIMA with regressors to data and interpret the results.

ULO6: smooth data and fit an appropriate ARIMA to the smoothed data.

General Assessment Information

There is no "group work" assessment in this unit.

ASSIGNMENT SUBMISSION

Assignment submission will be online through the iLearn page.

Submit the assignment online via the appropriate assignment link on the iLearn page. A personalised cover sheet is not required with online submissions. Read the submission statement carefully before accepting it as there are substantial penalties for making a false declaration. The assignment should be word processed.

- Assignment submission is via iLearn. You should upload this as a single PDF file.
- It is your responsibility to make sure your assignment submission is legible.
- If there are technical obstructions to your submission online, please email us to let us know.

You may submit as often as required prior to the due date/time. Please note that each submission will completely replace any previous submissions. It is in your interests to make frequent submissions of your partially completed work as insurance against technical or other problems near the submission deadline.

Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following university standard late penalty applied.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7 th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11:55 pm.
A 1-hour grace period is 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, students need to submit an application for Special Consideration.

Assessments where Late Submissions will be accepted

In this unit, late submissions will accepted as follows:

- **Assignment - YES, Standard Late Penalty applies**
- **Class Test 1 - NO, unless Special Consideration is Granted**
- **Class Test 2 - NO, unless Special Consideration is Granted**
- **Final Examination - NO, unless Special Consideration is Granted**

Requirements to Pass this Unit

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

The University Key Dates

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

Assessment Tasks

Name	Weighting	Hurdle	Due
Class Test 1	15%	No	Week 6
Assignment	10%	No	Week 9
Class Test 2	15%	No	Week 12
Final Examination	60%	No	University Examination Period

Class Test 1

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 10 hours
Due: **Week 6**
Weighting: **15%**

Test

On successful completion you will be able to:

- perform an appropriate Factor Analysis (FA) and interpret the results.
- perform a Conjoint Analysis (CA) and generate an orthogonal plan.

Assignment

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 10 hours
Due: **Week 9**
Weighting: **10%**

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:

- perform an appropriate principal components analysis (PCA) and interpret the results.
- perform an appropriate Factor Analysis (FA) and interpret the results.
- perform a Conjoint Analysis (CA) and generate an orthogonal plan.
- fit an appropriate AR, MA or ARIMA time series model to data and interpret the results.
- fit an appropriate ARIMA with regressors to data and interpret the results.

Class Test 2

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 10 hours
Due: **Week 12**
Weighting: **15%**

Test

On successful completion you will be able to:

- fit an appropriate AR, MA or ARIMA time series model to data and interpret the results.
- fit an appropriate ARIMA with regressors to data and interpret the results.
- smooth data and fit an appropriate ARIMA to the smoothed data.

Final Examination

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **University Examination Period**
Weighting: **60%**

Formal invigilated examination testing the learning outcomes of the unit.

On successful completion you will be able to:

- perform an appropriate principal components analysis (PCA) and interpret the results.
- perform an appropriate Factor Analysis (FA) and interpret the results.
- perform a Conjoint Analysis (CA) and generate an orthogonal plan.
- fit an appropriate AR, MA or ARIMA time series model to data and interpret the results.

- fit an appropriate ARIMA with regressors to data and interpret the results.
- smooth data and fit an appropriate ARIMA to the smoothed data.

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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

Classes

Lectures commencing **Week 1**: 1-hour lecture per week.

SGTA classes commencing **Week 2**: 2-hour class per week.

Technologies used and required

Lecture and SGTA materials will be available on *iLearn*. The statistical package *SPSS* will be used.

Recommended Texts

There is no set textbook for this unit.

Useful reference texts for the Market Research part of the unit are

- *Applied Multivariate Techniques* by Subhash Sharma (QA278.S485/1996)
- *Applied Multivariate Methods for Data Analysis* by Dallas E. Johnson (QA278.J615/1998)
- *Multivariate Statistical Methods* by Bryan F. J. Manly (QA278.M35/2004)

There is no suitable text for Conjoint Analysis. Most treatments in Market Research textbooks are either too simple or too technical. A useful reference for the Forecasting part is

- R J Hyndman and G Athanasopoulos (2021) Forecasting: principles and practice, (3rd ed.), OTexts: Melbourne, Australia.

Communication

We will communicate with you via your university email or through announcements on iLearn. Queries to the convenor can be posted on the iLearn *General Discussion*, sent via iLearn *Private Message to Unit Contact,* or emailed to your lecturer from your University email address.

COVID Information

If there are any changes to this unit concerning COVID -19, these will be communicated to you.

Unit Schedule

Week	Topic
1	Principal Component Analysis (PCA)
2	PCA
3	Factor Analysis (FA)
4	FA
5	Conjoint Analysis (CA)
6	Class Test 1
7	Introduction to Forecasting
8	ARIMA models
9	ARIMA models
10	Dynamic Regression models and intervention analysis
11	Exponential smoothing and Periodicity
12	Class Test 2
13	Revision

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

Since it is anticipated that this is the last time this unit will be offered, no change to the delivery of the unit is planned. However, we value student feedback and encourage students to provide constructive feedback via the FSE Student Experience & Feedback link on iLearn.

Unit information based on version 2024.01R of the Handbook