UNSW Course Outline

ECON5248 Business Forecasting - 2024

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General Course Information

Course Code : ECON5248
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : UNSW Business School
Academic Unit : School of Economics
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

<u>Useful Links</u>

<u>Handbook</u> <u>Class Timetable</u>

Course Details & Outcomes

Course Description

This course looks at the use of econometric and statistical techniques relevant to forecasting in a business environment and computer implementation of the methods: Both short-term forecasting with simple time series models, and longer-term forecasting that include seasonal

and trend terms are considered. Applied work using a statistical software package is emphasised in this non-specialist course.

Course Aims

This course is offered as one of the data analysis options in the MCom and MAppEc degree. Building on basic theories and knowledge outlined in the COMM5005 Quantitative Methods for Business course description, this course aims to provide the elementary principles and techniques of time series analysis that can be used in business forecasting; the course emphasises practical data analysis and keeps mathematical derivations to a necessary minimum. If you are planning to enrol in this course you need to have successfully completed, at a minimum, a course equivalent to COMM5005.

Relationship to Other Courses

This course is offered as one of the data analysis options in the MCom and MAppEc degree. Building on basic theories and knowledge outlined in the COMM5005 Quantitative Methods for Business course description, this course aims to provide the elementary principles and techniques of time series analysis that can be used in business forecasting, and emphasises practical data analysis. If you are planning to enrol in this course you need to have successfully completed, at a minimum, a course equivalent to COMM5005.

Course Learning Outcomes

Course Learning Outcomes	Program learning outcomes
CLO1 : Explain various notions/concepts/ principles in time series analysis and forecasting.	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO4 : Teamwork
CLO2 : Choose and use the standard techniques of time series analysis to analyse real data, and build appropriate forecasting models.	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO4 : Teamwork
CLO3 : Review and interpret models and forecasting results critically.	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO5 : Responsible Business Practice
CLO4 : Construct written work, which is logically and professionally presented.	• PLO3 : Business Communication
CLO5 : Master a modern statistical computer language.	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO4 : Teamwork
CLO6 : Master problem solving as a team.	• PLO2 : Problem Solving • PLO3 : Business Communication • PLO4 : Teamwork

Course Learning Outcomes	Assessment Item
CLO1 : Explain various notions/concepts/principles in time series analysis and forecasting.	• Problem Sets • Project • Final Exam
CLO2 : Choose and use the standard techniques of time series analysis to analyse real data, and build appropriate forecasting models.	• Problem Sets • Project • Final Exam
CLO3 : Review and interpret models and forecasting results critically.	• Problem Sets • Project • Final Exam
CLO4 : Construct written work, which is logically and professionally presented.	• Problem Sets • Project • Final Exam
CLO5 : Master a modern statistical computer language.	• Problem Sets • Project
CLO6 : Master problem solving as a team.	• Project

Learning and Teaching Technologies

Moodle - Learning Management System | Zoom

Learning and Teaching in this course

Learning Activities and Teaching Strategies

The examinable content of the course is defined by the references given in the lecture schedule, the content of lectures, and the content of the seminar program.

Lectures

The purpose of lectures is to provide a logical structure for the topics that make up the course; to emphasise the important principles/concepts/methods of each topic; and to provide relevant examples to which the principles/concepts/methods are applied. The lectures help you to see as a whole the material for each lecture, the preceding lectures and sometimes the following lectures; i.e., where the current material is motivated by previous material and where it will lead to future material. This is much harder to perceive from just reading the notes. The lectures also enable you to ask questions to enhance the learning process. The expectation is that students will attend the lectures if at all possible.

Seminars

The seminar program is scheduled in Weeks 1 to 10. Seminars are an integral part of the subject. Seminar presentations, discussions, and solutions to problems are designed to help students deepen their understanding and practise learnt material. The seminars will also help you learn and use the statistical package R that is used in the course.

Statistics Computer Package R is the computer package used in the course. The seminars will show you how to download and use R.

Out-of-Class Study

While students may have preferred individual learning strategies, most learning will be achieved outside of class time. Lectures can only provide a structure to assist your study, and tutorial time is limited.

An "ideal" strategy (on which the provision of the course materials is based) might include:

- Read the relevant chapter(s) of the text and lecture slides before the lecture. This will give you a general idea of the topic area.
- Attend lectures. Here the context of the topic in the course and the important elements of the topic are identified. The relevance of the topic is explained.
- Attempt seminar questions before attending the seminar class. This helps you identify issues that can be discussed and resolved in the seminar class.

Other Professional Outcomes

You will gain confidence in using a statistical/econometric language and also doing some improvisation in that language. You will also gain confidence in talking to your fellow students about the aims of a project as well as technical aspects of the statistical analysis.

Additional Course Information

The teaching strategy is to introduce the student with an underlying forecasting principle(s), connect that principle with a method and show how to implement the method in the statistical package used in the class. In our case it is the R language with fpp3 the forecasting package within R. Practice problems will be given each week to practice what is taught in class, and these will be reviewed in the tutorials.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates	Program learning outcomes
Problem Sets Assessment Format: Individual	20%	Start Date: PS1 will be available on Wed of W3 and PS2 on Wed of W6 Due Date: PS1 is due 6pm on Wed of W4 and PS2 due 6pm On Wed of W7	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO5 : Responsible Business Practice
Project Assessment Format: Group	25%	Start Date: 5 pm Monday of Week 6 Due Date: Due at 6 pm Monday of Week 9.	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO5 : Responsible Business Practice • PLO4 : Teamwork
Final Exam Assessment Format: Individual	55%	Due Date: UNSW Exam Period	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO5 : Responsible Business Practice

Assessment Details
Problem Sets

Assessment Overview

Two problem sets from which you will be asked to submit answers for selected questions for marking. Note that you will also be given other exercise sets to practice on, for which no submission is required. Solutions to all the exercise sets and the two problem sets will be available and discussed in the tutorials. The solutions you submit for the two problem sets should be entirely your own.

Course Learning Outcomes

- CLO1 : Explain various notions/concepts/principles in time series analysis and forecasting.
- CLO2 : Choose and use the standard techniques of time series analysis to analyse real data, and build appropriate forecasting models.
- CLO3 : Review and interpret models and forecasting results critically.
- CLO4 : Construct written work, which is logically and professionally presented.
- CLO5 : Master a modern statistical computer language.

Project

Assessment Overview

To be done in groups whose size will be specified during the course. The project report should be in the following form:

A description of the problem and a description of the proposed solution in some detail, and a description of the methodology. Plus an appendix with a more detailed description of the solution and methodology. The report without the appendix should be self sufficient.

Course Learning Outcomes

- CLO1 : Explain various notions/concepts/principles in time series analysis and forecasting.
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- CLO3 : Review and interpret models and forecasting results critically.
- CLO4 : Construct written work, which is logically and professionally presented.
- CLO5 : Master a modern statistical computer language.
- CLO6 : Master problem solving as a team.

Detailed Assessment Description

The purpose of this assignment is to test your ability to analyse data using the methods you have learnt in the course; to concisely summarise the issues involved and the conclusions you reach; and to work cooperatively in a team. It is your responsibility to find a partner. **The solution**

submitted by your group should be entirely that of your team.

A group contract, outlining group members' roles and responsibilities, must be agreed, finalised and submitted to the LIC and the tutor before group work commences. Students must also participate in a peer assessment, which will contribute 5% to the total mark for this assessment item.

Final Exam

Assessment Overview

The final exam is based on the whole course, covering the material in the lectures, tutorials, lecture notes, the relevant chapters from the assigned book, material in ALL the problem sets and exercise sets handed out, as well as any assigned reading. You may need to carry out data analyses using R.

Course Learning Outcomes

- CLO1 : Explain various notions/concepts/principles in time series analysis and forecasting.
- CLO2 : Choose and use the standard techniques of time series analysis to analyse real data, and build appropriate forecasting models.
- CLO3 : Review and interpret models and forecasting results critically.
- CLO4 : Construct written work, which is logically and professionally presented.

Detailed Assessment Description

You must pass the exam to pass this course.

The exam will be an open- book, take-home exam, where students will be given a window within which to read, complete, and submit the exam through Moodle. **There is to be no cooperation or discussion between students during the duration of the final exam.**

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

General Assessment Information

Grading Basis

Standard

Requirements to pass course

In order to pass this course students must:

- **You must pass the exam to pass this course.**
- Achieve a composite mark of at least 50 out of 100
- Engage actively in course learning activities and attempt all assessment requirements
- Meet any additional requirements specified in the assessment details
- Meet the specified attendance requirements of the course (see Schedule section)

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Lecture	Introduction to Forecasting and Time Series Graphics. PLease read 1. Chapters 1 and 2 of the textbook and the corresponding textbook slides. 2. My notes for week 1
	Seminar	The seminars covers: • Introduction to R • Class exercises in R Please read book appendix: Using R
Week 2 : 19 February - 25 February	Seminar	Go over some of the concepts in Lectures 1 and 2. Go over Exercise 1, given in Week 1
	Lecture	Please read textbook. Chapter 2: Time series graphics Chapter 3: Time series decomposition Chapter 4: Time series features My notes for Lecture 2
Week 3 : 26 February - 3 March	Lecture	Read chapter 5 of book. Read my notes for Lecture 3
	Seminar	Go over some concepts covered in Lecture 3 Go over Exercise 2
Week 4 : 4 March - 10 March	Lecture	Continue with ideas in Chapter 5 of book My notes for Lecture 4
	Seminar	Go over methods and ideas in Lecture 4 Go over Problem set 1 and possibly Exercise set 3
Week 5 : 11 March - 17 March	Lecture	Read chapter 8 of book. Read lecture notes for Lecture 5
	Seminar	Go over ideas in Lecture 5 Read my lecture notes for week 5 Go over exercise 4
Week 6 : 18 March - 24 March	Lecture	Continue with chapter 5 of book. Read my notes for Lecture 6
	Seminar	Go over concepts in Lecture of Week 6 Go over Exercise set 5
Week 7 : 25 March - 31 March	Seminar	Go over Problem set 2 and possibly Exercise set 6
	Lecture	Read chapter 9 on ARIMA models in textbook Read my notes on ARIMA models.
Week 8 : 1 April - 7 April	Seminar	Go over Exercise 7 Review concepts and code for week 5 to 7
	Lecture	Easter Monday. No lecture
Week 9 : 8 April - 14 April	Lecture	Contimue discussion on ARIMA models. Read my notes on Week 9 lecture
	Seminar	Discuss concepts and code for ARIMA and ETS models Go over Exercise set 8
Week 10 : 15 April - 21 April	Lecture	Read Chapter 7 of book. Time series regression models. Read my Week 10 notes
	Seminar	Go over exercise set 9 possibly include some project presentations by students
Week 11 : 22 April - 28 April	Lecture	Read chapters 10 and 13 of book. Chapter 10: Dynamic regression models. Chapter 13: Some practical forecasting issues
	Seminar	Review of exercise sets in course Some project presentations by students

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

Course Resources

Prescribed Resources

The website for this course is on Moodle:

The textbook for this course is:

Rob J Hyndman and George Athanasopoulos (3rd Edn, 2021), Forecasting: Principles and Practice.

The book is available online at https://otexts.com/fpp3/

You can also purchase the book in soft copy.

You will also find the slides based on the book at https://robjhyndman.com/teaching/

Lecture notes and slides will also be posted on Moodle.

SOFTWARE

- The software for the course is R and most of the exercises that you do will be in R. The assigned book uses R extensively. R is a modern statistical language that that has extensive capabilities and is free. This means that as part of the course you will master a modern computer package for data analytics and machine learning that is used extensively in business.

Recommended Resources

A useful book that was used as a textbook previously is

- Diebold, F.X. (2007), Elements of Forecasting, 4th Edition, Thomson South-Western

Some other useful books:
- Ord, J. K., Fildes, R., & Kourentzes, N. (2017). Principles of business forecasting (2nd ed.). Wessex Press Publishing Co. [Amazon]
- Armstrong, J. S. (Ed.). (2001). Principles of forecasting: A handbook for researchers and

practitioners. Kluwer Academic Publishers. [Amazon]

If you have the time and capability, you will also profit from reading some of Rob Hyndman's research papers.

Course Evaluation and Development

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the myExperience survey, which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

The School of Economics strives to be responsive to student feedback. If you would like more information on how the design of this course and changes made to it over time have taken students' needs and preferences into account, please contact the Director of Education at the School of Economics.

Consent for De-Identified Data to be Used for Secondary Research into Improving Student Experience

To enhance your student experience, researchers at UNSW conduct academic research that involves the use of de-identified student data, such as assessment outcomes, course grades, course engagement and participation, etc. Students of this course are being invited to provide their consent for their de-identified data to be shared with UNSW researchers for research purposes after the course is completed.

Providing consent for your de-identified data to be used in academic research is voluntary and not doing so will not have an impact on your course grades.

Researchers who want to access your de-identified data for future research projects will need to submit individual UNSW Ethics Applications for approval before they can access your data.

A full description of the research activities aims, risks associated with these activities and how your privacy and confidentiality will be protected at all times can be found here.

If you **consent** to have your de-identified data used for academic research into improving student experience, you do not need to do anything. Your consent will be implied, and your data may be used for research in a format that will not individually identify you after the course is completed.

If you **do not consent** for this to happen, please email the [opt-out form](#) to [seer@unsw.edu.au](#) to opt-out from having your de-identified data used in this manner. If you complete the opt-out form, the information about you that was collected during this course will not be used in academic research.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Head lecturer	Robert Kohn		UNSW Business School, Room 434	+61424802159	Wednesdays 4- 6 pm or by appointment	No	Yes
Tutor	Yangqi Zhang		UNSW Business School, Room 447		at tutorials	No	No

Other Useful Information

Academic Information

COURSE POLICIES AND SUPPORT

The Business School expects that you are familiar with the contents of this course outline and the UNSW and Business School learning expectations, rules, policies and support services as listed below:

- Program Learning Outcomes
- Academic Integrity and Plagiarism
- Student Responsibilities and Conduct
- Special Consideration
- Protocol for Viewing Final Exam Scripts
- Student Learning Support Services

Further information is provided on the [key policies and support](#) page.

Students may not circulate or post online any course materials such as handouts, exams, syllabi or similar resources from their courses without the written permission of their instructor.

STUDENT LEARNING OUTCOMES

The Course Learning Outcomes (CLOs) – under the Outcomes tab – are what you should be able to demonstrate by the end of this course, if you participate fully in learning activities and successfully complete the assessment items.

CLOs also contribute to your achievement of the Program Learning Outcomes (PLOs), which are developed across the duration of a program. PLOs are, in turn, directly linked to UNSW graduate capabilities. More information on Coursework PLOs is available on the key policies and support page. For PG Research PLOs, including MPDBS, please refer to the UNSW HDR Learning Outcomes.

Academic Honesty and Plagarism

As a student at UNSW you are expected to display academic integrity in your work and interactions. Where a student breaches the UNSW Student Code with respect to academic integrity, the University may take disciplinary action under the Student Misconduct Procedure. To assure academic integrity, you may be required to demonstrate reasoning, research and the process of constructing work submitted for assessment.

To assist you in understanding what academic integrity means, and how to ensure that you do comply with the UNSW Student Code, it is strongly recommended that you complete the Working with Academic Integrity module before submitting your first assessment task. It is a free, online self-paced Moodle module that should take about one hour to complete.

Submission of Assessment Tasks

SPECIAL CONSIDERATION

You can apply for special consideration when illness or other circumstances beyond your control interfere with your performance in a specific assessment task or tasks, including online exams. Students studying remotely who have exams scheduled between 10pm and 7am local time, are also able to apply for special consideration to sit a supplementary exam at a time outside of these hours.

Special consideration is primarily intended to provide you with an extra opportunity to demonstrate the level of performance of which you are capable. To apply, and for further information, see Special Consideration on the UNSW Current Students page.

Special consideration applications will be assessed centrally by the Case Review Team, who will update the online application with the outcome and add any relevant comments. The change to the status of the application immediately sends an email to the student and to the assessor with the outcome of the application.

Please note the following:

1. Applications can only be made through Online Services in myUNSW (see the UNSW Current Students page). Applications will not be accepted by teaching staff. The lecturer-in-charge/ course coordinator will be automatically notified when your application is processed.
2. Applying for special consideration does not automatically mean that you will be granted a supplementary exam or other concession.
3. If you experience illness or misadventure in the lead up to an exam or assessment, you must submit an application for special consideration, either prior to the examination taking place, or prior to the assessment submission deadline, except where illness or misadventure prevent you from doing so.
4. If your circumstances stop you from applying before your exam or assessment due date, you must apply within 3 working days of the assessment or the period covered by your supporting documentation.
5. Under the UNSW Fit To Sit/Submit rule, if you sit the exam/submit an assignment, you are declaring yourself well enough to do so and are cannot subsequently apply for special consideration.
6. If you become unwell on the day of – or during – an exam, you must stop working on your exam, advise your course coordinator or tutor and provide a medical certificate dated within 24 hours of the exam, with your special consideration application. For online exams, you must contact your course coordinator or tutor immediately via email, Moodle or chat and advise them you are unwell and submit screenshots of your conversation along with your medical certificate and application.
7. Special consideration requests do not allow the awarding of additional marks to students.

Further information on Business School policy and procedure can be found under "Special Consideration" on the key policies and support page.

LATE SUBMISSION PENALTIES

For assessments other than examinations, late submission will incur a penalty of 5% per day or part thereof (including weekends) from the due date and time. An assessment will not be accepted after 5 days (120 hours) of the original deadline unless special consideration has been approved. An assignment is considered late if the requested format, such as hard copy or electronic copy, has not been submitted on time or where the 'wrong' assignment has been submitted.

For assessments which account for 10% or less of the overall course grade, and where answers are immediately discussed or debriefed, the LIC may stipulate a different penalty. Details of such late penalties will be available on the course Moodle page.

FEEDBACK ON YOUR ASSESSMENT TASK PERFORMANCE

Feedback on student performance from formative and summative assessment tasks will be provided to students in a timely manner. Assessment tasks completed within the teaching period of a course, other than a final assessment, will be assessed and students provided with feedback, with or without a provisional result, within 10 working days of submission, under normal circumstances. Feedback on continuous assessment tasks (e.g. laboratory and studio-based, workplace-based, weekly quizzes) will be provided prior to the midpoint of the course.

Faculty-specific Information

PROTOCOL FOR VIEWING FINAL EXAM SCRIPTS

UNSW students have the right to view their final exam scripts, subject to a small number of very specific exemptions. The UNSW Business School has set a protocol under which students may view their final exam script. Individual schools within the Faculty may also set up additional local processes for viewing final exam scripts, so it is important that you check with your School.

If you are completing courses from the following schools, please note the additional school-specific information:

- Students in the **School of Accounting, Auditing & Taxation** who wish to view their final examination script should also refer to this page.
- Students in the **School of Banking & Finance** should also refer to this page.
- Students in the **School of Information Systems & Technology Management** should also refer to this page.

COURSE EVALUATION AND DEVELOPMENT

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the myExperience survey, which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

QUALITY ASSURANCE

The Business School is actively monitoring student learning and quality of the student experience in all its programs. A random selection of completed assessment tasks may be used

for quality assurance, such as to determine the extent to which program learning goals are being achieved. The information is required for accreditation purposes, and aggregated findings will be used to inform changes aimed at improving the quality of Business School programs. All material used for such processes will be treated as confidential.

TEACHING TIMES AND LOCATIONS

Please note that teaching times and locations are subject to change. Students are strongly advised to refer to the Class Timetable website for the most up-to-date teaching times and locations.