

CLASS SUMMARY | [BACK TO COURSE DETAILS](#)

Statistical Learning

A Postgraduate course offered by the **Rsch Sch of Finance, Actuarial Studies & App Stats.**

STAT7040

Overview

Assessment

Submission

Contacts

Statistical Learning is a course designed for students who need to carry out statistical analysis, or “learning”, from real data. Emphasis will be placed on the development of statistical concepts and statistical computing. The content will be motivated by problem-solving in many diverse areas of application. This course will cover a range of topics in statistical learning including linear and non-linear regression, classification techniques, resampling methods (e.g., the bootstrap), regularisation methods, tree based methods and unsupervised learning techniques (e.g. principle components analysis and clustering).

Learning Outcomes

Upon successful completion, students will have the knowledge and skills to:

1. Use packages and process output relating to statistical learning in the statistical computing package R.
2. Fit linear and non-linear regression models and analyse relationships between a response variable and covariates.
3. Perform a variety of classification techniques on qualitative response variables.
4. Assess models based on resampling methods.
5. Carry out model selection based on a variety of regularisation methods.
6. Utilise tree-based methods.
7. Perform unsupervised learning techniques.

Research-Led Teaching

An important component of this course is a final project, which will allow students to think creatively about potential solutions to data analytic problems.

CLASS NUMBER 2829

TERM CODE 3230

CLASS INFO

CLASS DATES

Unit Value	Class Start Date
6 units	21/02/2022
Mode of Delivery	Class End Date
In Person	27/05/2022
COURSE CONVENER	Census Date
Dr Anton Westveld	31/03/2022

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Dr Anton Westveld	31/03/2022
LECTURER	Last Date to Enrol
Dr Anton Westveld	28/02/2022

STATISTICAL LEARNING
([STAT7040](#))

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 - Assessment 3
- Submission Details
- Class Contacts

Additional Course Costs

A computer which is able to operate the current versions of R and RStudio.

Examination Material or equipment

There are no exams in the course.

Required Resources

Required Texts:

- James, Witten, Hastie,, and Tibshirani. 2021. An Introduction to Statistical Learning (second edition). Springer.
- The authors provide a free e-book for downloading at https://hastie.su.domains/ISLR2/ISLRv2_website.pdf
- Hastie, Tibshirani, and Friedman. 2009. The Elements of Statistical Learning: Data Mining, Inference, and Prediction (second edition). Springer.
- The authors provide a free e-book for downloading at <https://web.stanford.edu/~hastie/ElemStatLearn/>

Staff Feedback

Students will be given feedback in the following forms in this course:

- Self-study feedback in tutorials
- Self-study feedback from assignments
- Group in class or written feedback on performance in assignments
- Individual feedback on student performance in assessment tasks via Turnitin

Student Feedback

ANU is committed to the demonstration of educational excellence and regularly seeks feedback from students. Students are encouraged to offer feedback directly to their Course Convener or through their College and Course representatives (if applicable). Feedback can also be provided to Course Conveners and teachers via the [Student Experience of Learning & Teaching \(SELT\) feedback program](#). SELT surveys are confidential and also provide the Colleges and ANU Executive with opportunities to recognise excellent teaching, and opportunities for improvement.

Other Information

Support for Students

The University offers a number of support services for students. Information on these is available online from <http://students.anu.edu.au/studentlife/>

Communication via Email

If I, or anyone in the School, College or University administration, need to contact you, we will do so via your official ANU student email address, which you need to check regularly. If you have any questions for the teaching and course convenor make sure you email them using your ANU email address. Emails from personal email accounts will not be answered.

Announcements

Students are expected to check the Wattle site for announcements about this course, e.g. changes to timetables or notifications of cancellations.

Assessment Requirements

Any student identified, either during the current semester or in retrospect, as having used ghost writing services will be investigated under the University's Academic Misconduct Rule.

Scaling

Your final mark for the course will be based on the raw marks allocated for each of your assessment items. However, your final mark may not be the same number as produced by that formula, as marks may be scaled. Any scaling applied will preserve the rank order of raw marks and may be either up or down.

Co-teaching

The courses [STAT3040](#), [STAT4040](#), and [STAT7040](#) are co-taught.

Class Schedule

WEEK/SESSION	SUMMARY OF ACTIVITIES	ASSESSMENT
1	Introduction to Statistical Learning	
2	Regression - Review	Assignment 1 is Released; Tutorials Begin
3	Classification	
4	Resampling Methods	Assignment 1 is Due
5	Multiple Testing	
6	Linear Model Selection and Regularisation	Feedback for Assignment 1
7	Moving Beyond Linearity	Assignment 2 is Released
8	Tree-Based Methods	
9	Support Vector Machines	Assignment 2 is Due
10	Unsupervised Learning	
11	Time Permitting: Deep Learning (or another topic)	Final Project is Released

WEEK/SESSION	SUMMARY OF ACTIVITIES	ASSESSMENT
12	Time Permitting: Deep Learning (or another topic)	Feedback for Assignment 2

Tutorial Registration

Tutorials will be available on campus, live through scheduled Zoom sessions and as pre-recorded videos. Information regarding enrollments for these options will be provided on Wattle no later than week one of the semester

Assessment Summary

ASSESSMENT TASK	VALUE	DUE DATE	RETURN OF ASSESSMENT	LEARNING OUTCOMES
Assignment 1	10 %	18/03/2022	01/04/2022	1,2
Assignment 2	30 %	06/05/2022	29/05/2022	1,2,3,4,5
Final Project - Data Analysis and Competition	60 %	10/06/2022	30/06/2022	1,2,3,4,5,6,7

* If the Due Date and Return of Assessment date are blank, see the Assessment Tab for specific Assessment Task details

Policies

ANU has [educational policies, procedures and guidelines](#), which are designed to ensure that staff and students are aware of the University's academic standards, and implement them. Students are expected to have read the [Academic Integrity Rule](#) before the commencement of their course. Other key policies and guidelines include:

- Academic Integrity [Policy](#) and [Procedure](#)
- Student Assessment (Coursework) [Policy](#) and [Procedure](#)
- Special Assessment Consideration [Guideline](#) and [General Information](#)
- [Student Surveys and Evaluations](#)
- [Deferred Examinations](#)
- Student Complaint Resolution [Policy](#) and [Procedure](#)
- [Code of practice for teaching and learning](#)

Responsible Officer: Registrar, Student Administration / **Page Contact:** [Website Administrator](#) / [Frequently Asked Questions](#)