Department of Marketing | Te Mātauranga Tokoka

Otago Business School |Te Kura Pakihi

Semester Two | Kaupeka Tuarua
2026

MART548 Advanced Business Analytics

Nau Mai Haere Mai
Welcome | Afio Mai | Aere Mai | Mālō e me'a mai | Fakatalofa atu | Bula | Fakalofa lahi atu | Ulu tonu mai

Course Description and Aims | *Whāinga o te Akoranga*

This paper aims to develop mastery in the application of advanced analytics in a business marketing context using SAS. Topics include data marts, data access and integration, predictive modelling integrating machine learning, statistical methods, honest assessment, oversampling, decision weights, text mining and experimental design. A basic knowledge of undergraduate statistics for science, engineering, business etc., including regression, is expected.

Semester Two **0.1667 EFTS** **20 points**

Prerequisites:

Teaching Staff | *Kaiako*

Course Coordinator/Lecturer

Name: Dr Damien Mather
Office: OBS438
Email: Damien.mather@otago.ac.nz
Office Hours: Please see Blackboard.

You should contact Dr Damien Mather with any administrative enquiries about the course.
All requests for late submissions of assignments should be addressed to Dr Mathew Parackal
Email: mathew.parackal@otago.ac.nz

Expectations for Staff Response Time to Email Enquiries – 9am to 5pm, Monday to Friday, email response will generally be within 48 hours. Please be aware that staff are not available to respond to emails between 5pm Friday and 9am Monday.

Course Information | *Mōhiohio akoranga*

Lecture Day/Time: Mon 10:0-10:50am, Tue 10:00-10:50am, Fri 9:00-9:50am
Room: Please see your eVision timetable for venue information
Labs Day/Time: Tue 9:00-9:50am, Wed 1:00-1:50pm, Fri 4:00-4:50pm

Every week students must engage in 3 x 50-minute lectures and 3 x 50-minute labs. As much as possible of the lecture and lab material will be available online as an alternative to face-to-face delivery. The third timetabled lab slot on Friday will be held in reserve for additional contact time as required to keep up with the course calendar. This is noted in the course information above and in the Blackboard page for this course. Please check Blackboard regularly to ensure that you review any online material as it becomes available, usually on a Monday at 9:00am.

Lectures present the key conceptual material through discussion and interaction between teaching staff and students. Lectures are supported by readings.

Calendar The calendar (in this outline) details scheduling information. Note that this calendar may change as the course proceeds. Any changes will be announced at lectures and be detailed on Blackboard.

Students are expected to prepare for and attend all classes to gain full benefit from the course

These activities should be prepared for by reviewing information detailed on Blackboard and completing any assigned readings. Students unable to attend a lecture are expected to catch up on missed material. Unless stated otherwise, all aspects of the course are examinable.

Expectations and Workload | *Te Nui o te Mahi*

MART548 is a 20-point paper. As a general guide, 1 point represents study in formal instruction or independent study for 12 hours, made up of a combination of lectures, laboratories, assignments, and readings. As a result, you should anticipate spending approximately 240 hours on this subject over the duration of the semester, or, to put it another way, an average of 20 hours on average every teaching week.

Students are therefore expected to attend all scheduled sessions of lectures and labs each week and, in addition, to put in on average another 14 hours each week on self-directed study, analysis and writing reports and assignments. Students must spend about 1.5 hours per week preparing for lectures, 3 hours per week attending lectures, 3 hours per week attending computer labs, 3 hours per week on targeted readings, 30 minutes per week preparing participative monthly summaries and 5 hours a week writing each one of the 2 assignments or preparing for the final lab assessment. Participation in classes is an essential part of the course, in line with a peer assisted learning pedagogy. In order to encourage students to engage, participation will be assessed and rewarded. Note that class participation requires students to discuss questions posed by the lecturer in the class, critically evaluate their conclusions and attempt answers. Students will also be expected to contribute to Blackboard blogs on relevant course topics, posing and answering questions to and

from other students and the Course Leader. Lab participation includes documenting the lab work with screenshots and comments and critically answering questions about implications of findings for the business analysis problems in the course material.

Textbook Information | *Pukapuka Kaupapa*

The required text is Advanced Business Analytics, volumes 1 and 2, SAS Institute, 2012, referred to as the course notes in the calendar below. A PDF of the text is available for download from the Blackboard Course Documents page for this course. This text is supplemented by additional SAS special collection publications as noted in lectures, also available from the Blackboard Course Documents page for this course.

Calendar | *Maramataka*

Week	Week Commencing*	Topic	Reading
1	13 July	Overview of business analytics, data marts, data access & integration Basics of business analytics: thinking analytically, and introduction to terminology. SAS Viya for learners practical introduction	Course notes vol. 1 Chapters 1 & 2. Discovering SAS Viya special collection.
2	20 July	Classical statistics vs. business analytics, overview of techniques, data management, case studies (a financial institution, exploring data, descriptive reporting, visual exploration) SAS Enterprise Miner and SAS Viya Model Studio	Course notes vol. 1 Chapter 2, Exploring SAS Data Mining and Machine Learning
3	27 July	Data difficulties, SAS Enterprise Miner and Model Studio: Mail order catalog campaign case study: data source, defining column metadata, changing sampling defaults	Course notes vol. 1 Chapter 2; Exploring SAS Enterprise Miner special collection.
4	3 August	Honest Assessment, Project analytics methodology	Course notes vol. 1 Chapter 2
5	10 August	Honest Assessment, Project analytics methodology,	Course notes vol. 1 Chapter 2
6	17 August	Predictive Modelling: Decision trees, binary logistic regression using SAS, Catalog case study – logit regression	Course notes vol. 1 Chapter 4
7	24 August	Predictive Modelling: Model management, Churn case study, model management using SAS	Course notes vol. 1 Chapter 4. SAS and Open Source Model Management
Mid Semester Break 31st August – 4th September			
8	7 September	SAS Enterprise Miner and Sas Viya Model Studio: Text Mining: introduction, concepts, tools, example marketing applications	See Text Analytics with SAS special collection and Blackboard. **Assignment 1 due Monday the 7th. Of September at 5:00pm**
9	14 September	Multinomial Logit models as extension of binary logit. UK Coy House big data driven insolvency	See Blackboard for details

		consultancy client sales prospecting example. Contains an advanced use of SAS text mining to optimally adapt to big missing data problems.	
10	21 September	Motivation for experimentation, introducing experiments, multifactor experiments using SAS Viya Studio	SAS MR2010, Course Documents
11	28 September	Experimental design in a modern business context, orthogonality, case study: credit card case study, blocking designs, designs for interval/ratio target responses. Case study – battery life	Course notes vol. 1 Chapter 5. **Assignment 2 due Tuesday the 29th. September at 5:00pm**
12	5 October	Survival models 1: introduction, concepts, tools, simpler example applications using SAS Enterprise Miner Survival Application	See Blackboard for details.
13	12 October	Survival models 2: introduction, concepts, tools, more realistic example applications using SAS Enterprise Miner Survival Application.	See Blackboard for details. **The in-lab practical test starts at 1:00pm Wednesday the 14th. October**

*** First week of Semester 2 is ACADEMIC WEEK 29**
Lectures end Friday 16 October
University Exam Period Second Semester Begins Monday 19th Oct until Saturday 7th November.

Assessment | *Aromatawai*

All material presented is examinable (except where stated otherwise) by assignments and the final examination. All-important assessment information such as due dates and times, content, guidelines and so on will be discussed at lectures and, where appropriate, detailed on Blackboard. *Students are responsible for ensuring that they are aware of this information, keeping track of their own progress, and catching up on any missed classes.*

Assessment	Due date	% of final grade
Assignment 1: Part 1, the practical report: Create a subfolder for the SAS Enterprise Miner project called Organics in your EMP folder. Conduct the exercise in the course notes Ch 4 pp 75-76. Now perform the same analysis steps using SAS Viya Model Studio. Critically review and include selected only screen snapshots of your process to communicate your process quality. In other words, document the important steps in the practical exercise using screenshots and explanatory paragraphs to inform the reader. Answer all the questions posed in the exercise. Is there anything you could not do in SAS Viya Model manager that you could do in SAS Enterprise Miner? Explain your answers to all the questions. Part 2 essay topics:	5pm Monday the 7th. September	29

Research, discuss and debate: "Everyone will need analytics eventually. Proactively analytical people will be more marketable and more successful in their work" OR, if you prefer: Research, discuss and debate: What we have learnt from AI from the perspectives of business ethics, wellbeing, sustainable business models, and advanced predictive analytics? OR see any additional Assignment topics on Blackboard		
Assignment 2: Part1: Practical Report: Conduct a SAS Enterprise Miner Predictive Modelling exercise using regression: Start a new project called ORGANICS_3. Follow the steps in the textbook in Ch. 4 pp 75 and 76 up to step (d) adding a partition node). Then follow the steps in the textbook in Ch. 4 p 130. Now perform the same analysis steps using SAS Viya Model Studio. Remember to document the important steps in the practical exercise using screenshots and explanatory paragraphs to inform the reader. Is there anything you could not do in SAS Viya Model manager that you could do in Sas Enterprise Miner? Explain your answers to all the questions. Part 2 essay topics: Either: Research, discuss and debate: "What we have learnt about AI from the perspectives of business ethics, wellbeing, sustainable business models, and advanced predictive analytics?" OR "Research and debate the ethics of algorithms in the context of equity. Use a topical algorithm example and your knowledge of predictive model structures to recommend a way to make that algorithm more equitable." The first topic is not available if the student has already chosen the AI topic above for Assignment 1.	5pm Tuesday the 29th. September	29
Class participation: Assessed by lecturer based on depth and quality of questions and contributions both in class and online in Blackboard discussion threads, emails, and monthly learning summaries, assessed by the depth, quality, structure, organisation and grammar evident in the written questions, answers and reflections	Continuous (participation,) Wed 29th. July, Wed. 26th. August, and Wed. 23th. September (learning summaries)	13
Practical lab test in class. You will be given instructions at the beginning of the lab practical test.	Wednesday the 14th. October	29

Course Requirements

There are no terms requirements. To pass you just have to achieve 50% or higher overall.

Assessment Format
Practical reports should include sufficient screenshots to demonstrate or show evidence of the results of key decisions students make regarding inclusion or sequencing of analytic nodes and any changes to default node properties. Essays should be well-written in good academic English, with arguments, critiques and conclusions supported by citations and a bibliography that draws equally from both scholarly academic articles and proceedings as well as non-peer-reviewed industry sector periodicals and newspaper articles wherever possible. Submit all assignments via email to damien.mather@otago.ac.nz

Referencing Style
For this course the referencing style is *APA 7th*. Style guides are available on the University Library website: https://www.otago.ac.nz/library/referencing

Late Assignments
The standard late penalty shall be 5% of the maximum mark per day late or part thereof.
For example, assignments received up to 24 hours after the deadline will have 5% deducted from the available grade for the piece of assessment (i.e. a 78% becomes a 73%). Assignments received between 24 - 48 hours after the deadline will have 10% marks deducted from the available grade (i.e. 78% becomes 68%). An additional 5% penalty will be applied for every day late. Assignments submitted after seven days of the deadline, or after feedback is returned if this is less than seven days, will not be marked.
All penalty timeframes are inclusive of weekends, public holidays and university semester breaks and closure times.

Group Work
There is no group work in this course.

Learning Outcomes | *Hua Akoranga*

Learning Outcome	Assignment 1	Assignment 2	Engagement	Practical Test	Total
Understand modern data analytics in the context of typical business problems, data environments, business structures, ethical and sustainable business and customer contexts.	Y	Y	Y	N/A	
Reliably select and specify useful analysis steps in a given data mining / predictive modelling problem approach using SAS.	Y	Y	Y	Y	
Apply SAS analytical tools to typical business problems and data	Y	Y	Y	Y	
Critically evaluate data preparation and techniques to become effective analysts of typically messy, flawed business data using SAS.	Y	Y	Y	N/A	
Total	29%	29%	13%	29%	100%

Academic Integrity | *Pono-ā-wānanga*
Students should ensure that all submitted work is their own.
Academic integrity means being honest in your studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust,

responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, submitting work written by someone else (including from a file sharing website, text generation software, or purchased work) taking unauthorised material into a test or exam, impersonation, and assisting someone else's misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures.

It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the University's Academic Integrity website at **www.otago.ac.nz/study/academicintegrity**, or ask at the Student Learning Centre (HEDC) or the Library, or seek advice from your paper coordinator.

For further information on academic integrity at Otago:
Academic Integrity Policy

Student Academic Misconduct Procedures

A note about Artificial Intelligence: MART548 does not ban the use of large language models (LLMs) such as ChatGPT or Copilot, but you must fully disclose any LLM use in submitted internal assessment work, including full details of how and why you used them. Failure to do so may lead to academic misconduct proceedings.
You should be wary of LLMs in general, as they are purely statistical models with no actual "under- standing" or "knowledge". While their output sounds authoritative, it can often be misleading, incorrect, or totally fake. This is particularly dangerous when you do not have sufficient understanding of a topic to spot the errors.

For all submitted assessments students need to include a GenAI Use Disclosure & Evaluation statement as per the following:

GenAI Use Disclosure & Evaluation (Mandatory Component)
If GenAI was used, the following must be included:

- *the purpose for using GenAI*
- *prompts used*
- *critical evaluation of AI outputs (usefulness, limitations, and risks)*

If GenAI was not used:

- *a signed declaration confirming that GenAI was not used*

For further information on artificial intelligence at Otago:
Use of Generative-Artificial Intelligences and Autonomous Content Generation in Learning and Teaching Policy

Concerns about the Course | *Ngā māharahara mō te akoranga*

We hope you will feel comfortable coming to talk to us if you have a concern about the course. The Course Co-ordinator will be happy to discuss any concerns you may have. Alternatively, you can report your

concerns to the Class Representative who will follow up with departmental staff. If, after making approaches via these channels, you do not feel that your concerns have been addressed, there are University channels that may aid resolution. For further advice or more information on these, contact the departmental administrator or head of department.

Disclaimer | *Kupu Whakatonu*

While every effort is made to ensure that the information contained in this document is accurate, it is subject to change. Changes will be notified in class and via Blackboard. Students are encouraged to check Blackboard regularly. It is the student's responsibility to be informed.