

UGRD_SOA_2520_ACCT420_Benjamin LEE



Singapore Management University

COURSE INFORMATION

Course Code & Title	Academic Year / Term	Effective Start Date
ACCT420 - Forecasting and Forensic Analytics	AY2025-26 January Term	25/08/2025

Offering Unit / Department / School	Course Career
SOA	Undergraduate

Course Units	Grading Basis
CU:	GRD - Graded

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Course Description

This course explores how data can be used to solve problems across financial accounting, managerial accounting, and audit contexts. Students will gain exposure to techniques to explore how financial and non-financial data is used to forecast events, detect financial discrepancies and frauds, predict corporate default, optimize operations, and determine business strategy. Some programming and data visualisation skills will be required to draw insights from large volumes of data. Advanced analytics methods such as text analytics, neural networks and deep learning will also be introduced. This course has been designed to equip students with an analytics mind-set to develop analytics strategies and make better business decisions.

Standard Learning Outcomes (for SOA only)

LO1.1: Our students can recognize, develop, measure, record, validate and communicate financial and other related information., LO1.2: Our students can analyze, synthesize and evaluate financial and other related information for decision making in a management context.

Course Learning Outcomes

By the end of this course, students should be able to:

SMU Graduate Learning Outcomes

Multidisciplinary Knowledge, Interdisciplinary Knowledge, Critical thinking & problem solving, Self-directed learning, Resilience

Discipline Specific Competencies

Risk Assessment, Data Analytics, Programming and Coding

Course Area(s)

AREA - Accounting Data and Analytics Electives, AREA - Accounting Electives, AREA - Accounting Options, AREA - Analytics Major, AREA - Business Options, AREA - Business-Oriented Electives, AREA - Data Science and Analytics Electives, AREA - Econ Major Rel/Econ Options, AREA - Financial Forensics Core, AREA - Grad Req - Dig Tech/Data Ana (Intake 2024 onwards), AREA - IS Related Courses, AREA - Social Sciences/PLE Major-related, ENRL - SS Enrolment: 1 ISEP; 1 SUSEP, RQCP - ACCT419/ACCT337/DSA211, TRCK - Accounting Major: Data Analytics Track, TRCK - Analytics Major: Accounting Track

Simple Requirements

ACCT337/DSA211 - Pre-req

Type

Prerequisite

Complete ANY of the following Courses:

- ACCT337 - Statistical Programming

- DSA211 - Statistical Learning with R

CLASS SECTION INFORMATION

Instructor(s)

BENJAMIN LEE - (benjaminlee@smu.edu.sg)

Instruction Mode

In Person

Assessment Components (New)

Category	Description	Weightage
Class Participation and Activities	including DataCamp Assignments	25

Category	Description	Weightage
Projects/Assignments	Take-home and In-Class Assignments	25

Category	Description	Weightage
Projects/Assignments	Group Project and Presentation	40

Weekly Lesson Plan			
Category	Description		Weightage
Week	Topic(s)		
Projects/Assignments	Project Peer Evaluation		10
1	(Individual) Forecasting and Forensic Analytics Learning Roadmap		
	Accounting Manipulation Concepts		
2	Pre-Seminar Recording: <i>Classic Financial Fraud models, Logistic Regression, Model Evaluation</i>		
	Predicting Accruals using Linear Regression		
	Logistic Regression for Fraud Prediction		
3	Pre-Seminar Recording: <i>Ensembles, Text Analytics, and Explainability</i>		
	Modern Machine Learning and Text Analytics for Fraud Detection		
4	Explainability of Algorithms	SMU Research Librarian WRDS Primer	
5	In-Class Assignment (I)	Guest Speaker Session	
6	Pre-recorded Seminar and Python Walkthrough: Introduction to Conformal Prediction <i>Week of Chinese New Year</i>		
7	Project Consultations	Client Introduction	
8	Mid-Term Break		
9-10	Practical AI Applications for Forensic Analytics		
11	In-Class Assignment (II)	Project Consultations	
12	Course Summary	Project Consultations	
13	Group Project Presentations		

Recommended Textbooks and Readings

Online Resource: DataCamp (link will be provided on eLearn discussion board and Telegram)

Optional Reference Text: R for Everyone by Jared Lander 2nd edition (2017)

Additional Reference Books (previously used in ACCT337 Statistical Programming):

Data Mining for Business Analytics: Concepts, Techniques, and Applications in R by

Galit Shmueli, Peter C. Bruce, Inbal Yahav, Nitin R. Patel, Kenneth C. Lichtendahl Jr. (2018)*

*Physical copies are available in the Library and e-copies are available at library.smu.edu.sg

An Introduction to Statistical Learning (with applications in R) by Gareth James, Daniela Witten,

Trevor Hastie and Robert Tibshirani (2013); available at: <http://www-bcf.usc.edu/~gareth/ISL/>

The Art of R Programming by Norman Matloff (2009); available at:
<http://heather.cs.ucdavis.edu/~matloff/132/NSPpart.pdf>

Other resources:

- o Students are required to install R and RStudio on their laptops.

- § R is a free statistical language widely used by data science professionals

- o For Python, it will be accessed through Google Colab

- o Access to financial databases and other data through SMU Library

Other Information

Students are expected to have RStudio and its necessary plugins installed before the first lab session. R Packages can be loaded from the library during the lab sessions. The R version that RStudio requires to run must be 4.0.2 or newer. If you are running an older version, please download an up-to-date version from www.r-project.org.

Course Assessment Details

No questions verbatim from past year papers or published test banks will be used for the graded continuous assessments in the course. (There is **no final exam** for this course.)

I. Class Participation (25%): a continuous assessment throughout the term where students are involved in interactive in-class discussions and other out-of-class activities.

4 components:

1. Attendance (3%)
2. Self-Reflection Journal (3%)
3. In-class discussions and participation (7%)
4. DataCamp Assignments on R (12%)

Details on DataCamp Assignments: 5 assigned DataCamp* courses.

#	Assignment	Due by end of	Est. Time (hours)
1	Introduction to R for Finance	Week 2	4
2	Modelling with Data in the tidyverse	Week 4	4
3	Supervised Learning in R: Regression	Week 6	4
4	Supervised Learning in R: Classification	Week 8	4
5	Modelling with tidymodels in R	Week 10	4
6	Introduction to Text Analysis in R	Week 12	4

*Note: DataCamp courses sometimes includes additional code and functions beyond course material. The other assessment components will only assess you on R code, techniques, and theories covered **in-class**. The purpose of these DataCamp assignments is to give you a broader exposure to R syntax and how it can be used for statistical learning and machine learning. Feel free to use what you have learnt in DataCamp in your Group Project. You will be graded on completion **only**.

II. In-Class Assignments (25%):

In-Class Assignment (I): Accounting Fraud (10%): To be done **DURING the first 1 hour of Week 5**.

In-Class Assignment (II): Forensic Analytics (15%): To be done **DURING the first 1 hour 30 minutes of Week 11.**

These are purely conceptual assignments that will be done in the Lockdown Browser environment. You **will not be required to use R or Python to code** for these assignments. But you might be asked about how you would use existing packages or functions to execute certain tasks. More details will be provided when term starts.

III. Group Project and Presentation (40% in total): Details TBC.

The projects will be evaluated on 3 main categories:

- R Code (10%) – Codes that are used to generate the analyses
- Report (10%) – Report that consists of a technical section explaining the logic behind the implementation the R codes and a writing section detailing the business analysis
- Group Presentation (20%) – Delivered in Week 13

***You are welcome to use other tools beyond the scope of the course such as.** However, you must ensure that your presentation and report are not overly technical and focused only on how your analysis answers the project problem statement.

IV. Internal Peer Evaluation (10%): to be completed on eLearn by end of

- Week 7
- Week 13

UNIVERSITY POLICIES

Academic Integrity

All acts of academic dishonesty (including, but not limited to, plagiarism, cheating, fabrication, facilitation of acts of academic dishonesty by others, unauthorized possession of exam questions, or tampering with the academic work of other students) are serious offences.

All work (whether oral or written) submitted for purposes of assessment must be the student's own work. Penalties for violation of the policy range from zero marks for the component assessment to expulsion, depending on the nature of the offence.

When in doubt, students should consult the instructors of the course. Details on the SMU Code of Academic Integrity may be accessed at <https://smu.sharepoint.com/sites/oasis/SitePages/DOS-WKLSWC/UCSC.aspx>.

Responsible Use of AI

The University recognises the importance of equipping students with the skills to navigate an AI-driven world. While AI tools may support learning, they must be used judiciously and responsibly. Students must not present AI-generated output as their own work.

Each course may set specific guidelines on the use of AI in assessments. Students are required to follow these guidelines carefully and should seek clarification from the instructors if uncertain.

Misuse of AI constitutes a breach of academic integrity and will be subject to the same penalties as other acts of academic dishonesty.

Copyright Notice

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Accessibility

SMU strives to make learning experiences accessible for all. Students who anticipate or experience physical or academic barriers due to disability are encouraged to inform the course instructor as soon as possible. Students may also contact the university's disability services team if they have questions or concerns about academic provisions:

accessibility@smu.edu.sg. Please be aware that the accessible tables in our seminar room should remain available for students who require them.

Digital Readiness for Teaching and Learning (DRTL)

As part of emergency preparedness, instructors may conduct lessons online via the Zoom platform during the term, to prepare students for online learning. During an actual emergency, students will be notified to access the Zoom platform for their online lessons. The class schedule will mirror the current face-to-face class timetable unless otherwise stated.