



ACCT420

Forecasting and Forensic Analytics

Course Outline 2023/2024 Term I

A. Instructor and general information

Instructor:	Richard Crowley
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Course website:	https://elearn.smu.edu.sg and https://rmc.link/acct420
Consultation hours:	By appointment. book at https://rmc.link/420OH
Class hours:	3:30pm to 6:45pm, Tuesdays

B. Course prerequisites

Experience using R (ACCT337 Statistical Programming (previously ACCT419), equivalent, or another approved course)

C. Course description

This course explores how data can be used to solve accounting 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 defaults, optimize operations, and determine business strategy. The emphasis of this class will be on problem solving, theory, and application, with additional emphasis on interpretation and communication. Some programming will be required, but programming help will be provided at the start of the semester via online tutorial and through instructor-provided code. Some 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.

D. At a glance:

- Class sessions will consist of lecture, class discussion, problem solving, and some group work
- Electronic device usage is encouraged, given the nature of the subject
- All important announcements will be made on eLearn and in class (time permitting)
- Assessment: 10% participation, 20% individual projects, 30% group project, 40% final exam
- *Readings:*
 - Textbook: N/A. If you prefer having a book, I recommend *R for Everyone* by Jared Lander
 - Selected excerpts from recommended texts.
- *Other resources:*
 - Students are required to install R on their laptops.
 - R is a free statistical language widely used by data science professionals
 - Students are recommended to install RStudio on their laptops, a free R interface
 - Financial databases and other data as provided in class



E. Learning goals, course objectives, and skill development

This course contributes to the development of the following learning goals and objectives of the School's Bachelor of Accountancy program:

Learning Goal 1 (Accounting Competencies):

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.

Students are expected to demonstrate the following technical competencies upon successful completion of this course:

Understand the role of data analytics in solving accounting and business problems, such as revenue prediction, bankruptcy prediction, and fraud detection.

Demonstrate familiarity with statistical programming in the contexts of forecasting and forensics.

Transform financial and nonfinancial data into useful insights for business.

Communicate inferences from analysis through writing, speaking, and visuals.

Develop an ability to independently learn and explore new methods in analytics in this ever-changing field.

Class activities are designed to further develop students' analytical, communication, and active learning skills, as well as students' professional ethics. Students must be prepared to go beyond lecture materials and prescribed reading.

F. Course philosophy

The emphasis of the class will be on **problem solving, theory, and application**. Emphasis will also be placed on **interpretation** and **communication**, as being able to describe analysis and conclusions is as important as the analysis itself.

As this course is not a programming class, some coding assistance will be provided, though students are expected to have a working knowledge of statistical programming in R. The first week of the course will serve as a review of R, with in class training (by the professor) and optional out of class training (online). As new concepts are introduced, time will be provided in-class for hands-on coding practice. For all assignments and lessons, a body of code will be made available for the technical aspects of the project. Likewise, all code for analyses presented in-class in lecture slides is made available online. Students will be encouraged to write code themselves but are encouraged to reference provided code as needed. This allows students to implement needed coding while remaining focused on the underlying analysis.

As this course is too short to fully introduce students to all relevant methods for forecasting and forensic analytics, additional material will be made available to those interested in furthering their learning.

G. Abridged lesson plan

Introduction and review of statistics and statistical programming in R (1.5 weeks)	
Forecasting financial metrics (1.5 weeks)	Leveraging financial and nonfinancial data
Identifying red flags for contracting (1 week)	Logistic regression for prediction
Predicting default and bankruptcy (1 week)	Leveraging existing models
Fraud detection (1 week)	Textual analytics
Analyzing unstructured data (2 week)	Unsupervised methods
Ethics of Artificial Intelligence, neural networks, and other recent advances in analytics (3 weeks)	

H. Assessment

To pass this course, a student is required to obtain a **total** mark of 50% or better. The assessment components for this course are:

Class Participation	10%
Individual Assignments	20%
Group Project	30%
Final exam	40%
Total	100%

Individual assignment will relate to material discussed in class, encouraging students to dig deeper into the covered material. The group project will focus on using financial and nonfinancial information to enhance analytics for traditional financial forecasting or forensics analysis. Class participation will be based on both in and out of class participation and professionalism. No questions verbatim from past year papers or published test banks will be used for the graded continuous assessments and examinations in the course.

I. Other matters

Please check the course website regularly in order not to miss important announcements. Although major announcements will be made both in classroom and course website, it is the sole responsibility of the students to find out what has been announced during their absence from class.

I strongly encourage you to let me know of any course-related problems as soon as they arise. As each lesson builds on the previous lessons' material, it is important that you understand the material before moving on to new material. Furthermore, the level of difficulty of the course increases as it progresses; hence, it is important to address any confusion or difficulties upfront.

J. 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 offense.

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

K. Copyright

Please note that all course materials are meant for personal use only, namely, for the purposes of teaching, studying and research. You are strictly not permitted to make copies of or print additional copies or distribute such copies of the course materials or any parts thereof, for commercial gain or exchange.

For the full copyright notice, please visit: <https://smu.sg/Copyright-notice> or OASIS -> CAMPUS LIFE & EXCHANGE -> CONDUCT & DISCIPLINE -> UNIVERSITY COUNCIL OF STUDENT DISCIPLINE

L. Accessibility

SMU strives to make learning experiences accessible for all. If you anticipate or experience physical or academic barriers due to disability, please let me know immediately. You are also welcome to contact the university's disability services team if you have questions or concerns about academic provisions: DSS@smu.edu.sg. Please be aware that the accessible tables in our seminar room should remain available for students who require them.

M. 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.