



## GLOBAL SUMMER PROGRAMME 2020

### ACCT008 ACCOUNTING ANALYTICS IN ASIA

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#### A. COURSE DESCRIPTION

Artificial Intelligence (AI), Machine Learning (ML) and Analytics are transforming and disrupting the accounting and finance profession in unprecedented ways. Beyond just being trending buzz words, AI/ML/Analytics now have the practical capabilities to carry out many tasks that are within the scope of accounting and finance professionals. However, rather than worrying that their jobs are on the line, accountants should embrace AI/ML/Analytics in their line of work. Doing so will free them from repetitive and mundane tasks, allowing them to focus on value-adding tasks while the tedious gruntwork is done by their AI counterparts.

This course aims to provide students with the foundational understanding of analytics through its 4 stages (descriptive, diagnostic, predictive and prescriptive). The course will focus on the application of analytics in accounting with a part of it involving the use of R Programming to statistically analyse accounting data. Along with the critical analysis of successful use cases in Asia, the course will also cover the misconceptions that Asian economies have about AI/ML/Analytics, the challenges faced during implementation and the ethical aspects of adopting these technologies.

#### B. LEARNING OBJECTIVES

At the end of the course, students are expected to:

- Understand the 4 Stages of Analytics and apply them into data analysis cases or projects
- Implement basic operations of R for statistical analysis (specifically in linear regression)
- Critically analyse analytics projects and come up with solutions on how to improve them

#### C. PRE-REQUISITES / REQUIREMENTS / MUTUALLY EXCLUSIVE COURSES (IF ANY)

This course does not require any pre-requisite.

#### D. ASSESSMENT METHODS / GRADING DETAILS

Individual Class Participation	20%
Weekly Individual Reflection Journal	20%
Individual Coding Assignment	30%
Group Project Presentation	30%
<b>Total</b>	<b>100%</b>

## E. 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 <http://www.smuscd.org/resources.html>.

## F. ACCESSIBILITY

SMU strives to make learning experiences accessible for all. If students anticipate or experience physical or academic barriers due to disability, please let the instructor know immediately. Students are also welcome to contact the university's disability services team if they have questions or concerns about academic provisions: [included@smu.edu.sg](mailto:included@smu.edu.sg).

Please be aware that the accessible tables in the seminar room should remain available for students who require them.

## G. INSTRUCTIONAL METHODS AND EXPECTATIONS

**Individual Class Participation:** Continuous assessment throughout the term where students are involved with interactive in-class discussions.

Selected in-class discussions will revolve around topics covered in CPA Australia's Charting the Future of Accountancy with AI:

<https://www.cpaaustralia.com.au/~media/corporate/allfiles/document/professional-resources/business/charting-the-future-of-accountancy-ai.pdf>

Mark Range	Comments
3	Outstanding Contributor. This student was well prepared and contributed actively to class discussion. His/her presence in the seminar significantly enhanced the learning experience for all students.
2	Good Contributor. This student was well prepared and contributed occasionally to class discussion, but was an active participant during in class small group learning
1	Poor contributor. This student had done minimal preparation and generally did not actively participate in class.
0	Unsatisfactory contributor. This student was unprepared and/or did not participate.

## Weekly Individual Reflection Journal

Self-reflection journal on what was learnt that week (3 classes)

- What did I expect to learn?
- What did I learn?
- How did I contribute to the learning of the class today (if any)?
- What problems did I encounter during the R session?
- Was I able to overcome them and how did I do that?
- Is there something I need more time to work on before the next lesson?

**Individual Coding Assignment:** Take-home R Coding Assignment incorporating the using of R for data manipulation, data mining, evaluation of mining results and interpretation of results (due by the end of week 3)

**Group Project Presentation:** Proposal Presentation of an accounting analytics project based on fictional cases which involves the incorporation of the Stages of Analytics and use of Machine Learning techniques.

## H. CLASSROOM POLICIES

Class Engagement Policy for Accounting Analytics in Asia

- If everyone plays their part and gets involved in discussions, all of us will have a more interesting and lively class that allows us to learn from each other
- To ensure that everyone is fully focused in class, these are some ground rules:
  - Laptops, tablets and mobile phones should only be used for note-taking, NOT YouTube, Reddit, Netflix (among the many other things we all get distracted by)
  - Laptop-use during R Lab session of the lessons
  - All web-messaging apps (WhatsApp, WeChat, Telegram, iMessage, Messenger etc.) MUST be switched off during the Lab sessions
- Prepare for classes beforehand by reading the slides and any related readings given
- Merely being in class is not sufficient for the Class Participation component
- Punctuality (including after breaks)

## I. IMPORTANT ASSIGNMENT DATES

1.	Weekly Individual Reflection Journal:	Lesson 3, 6, 9 and 11
2.	Individual Coding Assignment:	Lesson 9
3.	Group Project Presentation:	Lesson 12

## J. CONSULTATIONS

To be advised.

## K. RECOMMENDED TEXT / READING LIST / CASE STUDIES LIST

- **Charting the Future of Accountancy with AI:**  
<https://www.cpaaustralia.com.au/~media/corporate/allfiles/document/professional-resources/business/charting-the-future-of-accountancy-ai.pdf>

LESSON PLAN	
LESSONS	SESSIONS
<p>LESSON 1 (Tue, 30 June)</p>	<p><b>WHAT IS DATA AND ANALYTICS?</b></p> <ul style="list-style-type: none"> <li>• 4 stages</li> <li>• Misconceptions</li> </ul> <p><b>WHAT IS ACCOUNTING DATA?</b></p> <ul style="list-style-type: none"> <li>• Purpose of Accounting Data</li> <li>• Accounting's place in Analytics</li> </ul>
<p>LESSON 2 (Wed, 1 July)</p>	<p><b>KNOWLEDGE DISCOVERY IN DATA (KDD)</b></p> <p><b>BASIC MACHINE LEARNING CONCEPTS</b></p> <ul style="list-style-type: none"> <li>• Supervised and Unsupervised Learning</li> <li>• Data Mining</li> <li>• Techniques</li> </ul>
<p>LESSON 3 (Thu, 2 July)</p>	<p><b>PROGRAMMING BASICS IN R</b></p> <ul style="list-style-type: none"> <li>• Scalars, Vectors, Matrices, Data frames and Lists</li> <li>• Data types</li> </ul> <p><b>DESCRIPTIVE ANALYTICS</b></p>
<p>LESSON 4 (Tue, 7 July)</p>	<p><b>DATA VISUALISATION (1)</b></p> <ul style="list-style-type: none"> <li>• Explanatory and Exploratory</li> <li>• Pre-Attentive Working Attributes</li> <li>• Analytical Patterns</li> <li>• Human Visual Perception</li> </ul> <p><b>DIAGNOSTIC ANALYTICS</b></p>
<p>LESSON 5 (Wed, 8 July)</p>	<p><b>DATA VISUALISATION (2)</b></p> <ul style="list-style-type: none"> <li>• Common Mistakes in Visualisation</li> <li>• Visualisation Fundamentals</li> <li>• Dashboarding Fundamentals</li> </ul>

<p>LESSON 6 (Thu, 9 July)</p>	<p><b>DATA VISUALISATION (3)</b></p> <ul style="list-style-type: none"> <li>• ggplot2 in R</li> <li>• Correlation plots in R</li> </ul>
<p>LESSON 7 (Tue, 14 July)</p>	<p><b>PREDICTIVE ANALYTICS AND PRESCRIPTIVE ANALYTICS</b></p> <p><b>STATISTICAL MODELLING (1)</b></p> <ul style="list-style-type: none"> <li>• Ordinary Least Squares (OLS)</li> <li>• Simple Linear Regression</li> <li>• Regression with Predictive Analytics</li> </ul>
<p>LESSON 8 (Wed, 15 July)</p>	<p><b>STATISTICAL MODELLING (2)</b></p> <ul style="list-style-type: none"> <li>• Multiple Linear Regression</li> <li>• Regression Modelling in R</li> </ul>
<p>LESSON 9 (Thu, 16 July)</p>	<p><b>STATISTICAL MODELLING (3)</b></p> <ul style="list-style-type: none"> <li>• Non-Linear Regression</li> <li>• Variable Selection using subset selection algorithms</li> </ul>
<p>LESSON 10 (Tue, 21 July)</p>	<p><b>ETHICS OF AI APPLICATION IN ACCOUNTING</b></p>
<p>LESSON 11 (Wed, 22 July)</p>	<p><b>FIELD TRIP: VISIT TO PAYPAL</b></p>
<p>LESSON 12 (Thu, 23 July)</p>	<p><b>GROUP PROJECT PRESENTATIONS (15 minutes per group)</b></p>