

Assumption University
Vincent Mary School of Science and Technology
Course outline
(Semester 1/2022)

ITX 2006/ CSX 2006 Mathematics and Statistics for Data Science

Course status:	Basic Course 3 credits
Pre-requisite(s):	ITX 2003/ CSX 2003 Principles of Statistics
Section:	541
Lecturer:	Dr. Khaing Sandar Htun
E-mail:	khainghtun@scitech.au.edu
Advising hour:	By appointment

Text Book:

There is no required "textbook" for this course. Selected chapters from the following references and other sources will be used. Students will be supplemented with instructor-developed lectures from other sources.

References:

1. D.R. Anderson, D.J. Sweetney, T.A. Williams, "Statistics for Business and Economics", 12th edition, South-Western Cengage Learning, 2014.
2. John E. Hanke & Dean W. Wichern, "Business Forecasting, 9th edition". Pearson Prentice Hall, 2009.
3. Gareth Williams, "Linear Algebra With Applications", 8th edition, Jones & Bartlett Learning, LLC, an Ascend Learning Company, 2014.

Course Description:

Linear algebra such as vector spaces in n -space, inner product, norm and distance, orthogonal vector, vector product, Orthogonal functions and Fourier series, including various techniques in multivariate data analysis such as multiple regression analysis, discriminant analysis, logistic regression analysis, principal component analysis, factor analysis, and cluster analysis.

Course Objective:

- To equip students with the knowledge in intermediate linear algebra such as vector spaces in n -space, inner product, norm and distance, orthogonal vector, vector product, Orthogonal functions and Fourier series.
- To equip students with the knowledge in forecasting techniques such as regression analysis and times series analysis.
- To help enabling students to analyze Statistical Technique and familiarized with the Statistical Software package(s).

Class Schedule: Monday 09:00 – 13:00 (MS Teams)

Week	Date	Topics	Assignment
1	June 6	Introduction to the course Part I: Chapter 1 - Introduction to Forecasting in Data Science Chapter 2 - Simple Linear Regression Analysis and Correlation Analysis	
2	June 13	Chapter 2 (continued) Chapter 3 - Multiple Linear Regression Analysis (continued)	#1 Due: June 18
3	June 20	Chapter 3 (continued) <i>Assignment presentation/demonstration (Chapter 2)</i>	#2 Due: June 25
4	June 27	<i>Assignment presentation/demonstration (Chapter 3)</i> Chapter 4 - Exploring Data Patterns and An Introduction to Forecasting Techniques	#3 Due: July 2
5	July 4	<i>Assignment presentation/demonstration (Chapter 4)</i> Chapter 5 - Forecasting Techniques	
6	July 11	Chapter 5 (continued)	#4 Due: July 16
7	July 18	<i>Assignment presentation/demonstration (Chapter 5)</i> QUIZ 1	
8	July 25	Chapter 6 - The Box-Jenkins (ARIMA) Methodology <i>Revision</i>	
9 - 10	August 1 - 9	Mid-term Examinations Tuesday, August 2, 2022 (15:00 – 17:00)	
11	August 15	Discussion for Project Part II: Chapter 1 - Matrices and Systems of Linear Equations	#5 Due: August 20
12	August 22	Chapter 2 - Determinants and Eigenvector	
13	August 29	Chapter 2 (continued)	#6 Due: September 3
14	September 5	Chapter 3 - Vector Spaces \mathbb{R}^n	#7 Due: September 10
15	September 12	Chapter 4 - Geometry of Vector Space \mathbb{R}^n and Inner Product Spaces	#8 Due: September 17
16	September 19	QUIZ 2 <i>Revision</i>	Submission of Term Project Due: September 24
17	September 26	<u>Term Project Presentation</u>	

18 - 20	October 3 - 18	Final Examinations Wednesday, October 5, 2022 (13:00 – 16:00)
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Mark Allocation:

Assignments (presentations and class/lab work)	20%
Term Project (Research)	10%
Quizzes	10%
Midterm examination	20%
Final Examination	40%
TOTAL	100%

Other Requirements:

1. 80% class attendance is required to sit in the final examination.
2. Students should bring learning materials to all the classes.

Assignment: Each student will perform an extensive problem solving on the given topics.

Term Project: Each student will conduct a mini research on the assigned topic. Project report is around 8-10 pages and presentation and answering question is around 10-15 minutes.

NOTE: Late submission will be penalized by 20% per day and will not be accepted at all 3 days after the time due. In special circumstances such as illness or emergency issues, I will try to be accommodating.

Plagiarism: Plagiarism in any of its several forms is intolerable.

Plagiarism is a serious offence which involves using the work of other people as if it was your own. This offence will not be tolerated and the following instructions to students regarding this offence must be read and understood by all students.

Students should note that if they allow others to copy their work then they will be considered to be guilty of plagiarism and they will be subject to the same treatment and penalties as those who used their work.

Unless it is stated by the lecturer that a piece of work may be done and submitted as a group exercise then students should assume that it must be a piece of individual work that is submitted. If there is any doubt about this, it is the responsibility of the student to seek clarification from the lecturer before submitting the work.

The first time a student commits this offence they will receive a strict warning from the course lecturer, and they will receive **only half marks** for the work involved. Their **names will be recorded** for future reference on the Information Technology Department's Plagiarism Offenders List.

If a student commits this offence for **a second time** in the same or any other course then they will receive **zero marks** for the work and they will be reported to the Head of Department who will ensure that they are reported to the appropriate authority within the University so that **further action** may be taken.
