澳門大學
UNIVERSIDADE DE MACAU
UNIVERSITY OF MACAU

Major Programme:	Bachelor of Science in Electrical and Computer Engineering		
Course Type:	☑ CM – Compulsory Major □ CPE – Community and Peer Education □ GE – General Education □ MI – Minor □RE – Required Elective □ L&S – Languages and Skills □ FE – Free Elective		

GE Area in 2017/2018 model (applicable to students admitted in academic year 2017/2018 onwards)

□ Science and Technology, FHS
□ Society and Behaviour, FSS
□ Literature and Humanities, FAH
□ Global Awareness, FSS

Equivalent to 2011/2012 GE model (applicable to students admitted in academic year 2016/2017 or before)

□ Area 1 – English Language
□ Area 2 – Chinese/Foreign Language
□ Area 3 – Communication
□ Area 4 – Mathematics/Quantitative Reasoning
□ Area 5 – Information Technology and Knowledge Society
□ Area 6 – Physical Science and the World
□ Area 7 – Life Science, Health and the Human Condition
□ Area 8 – World Histories and Cultures
□ Area 9 – Macao, China and other Societies
□ Area 10 – Values, Ethics and Meaning of life
□ Area 11 – Physical Education
□ Area 12 – Visual and Performing Arts
□ Area 13 – University Life

Course Title: (in English, Chinese and Portuguese)	Linear Algebra, Probability and Statistics for Electrical and Computer Engineering 電機及電腦工程線性代數、機率及統計 Álgebra Linear, Probabilidade e Estatística para Engenharia Electrotécnica e de Computadores		
Course code	ECEN2018	Credit Units:	4
Duration:	☑ Semester Course □ Yearly Course	Suggested Year of Study:	Year 2
Grading System:	☑ Letter Grade □ P/NP	Pre-requisite: (if any)	None
Medium of Instruction:		English	
Text Book and Reference	Elementary Linear Algebra, H. Anton & C. Rorres, Wiley; 10th edition (2010)		
Course Description:	The first part of this course gives an introductory treatment of linear algebra that is suitable for a first undergraduate course on the topic. Its aim is to present the fundamentals of linear algebra in the clearest possible way sound pedagogy is the main consideration. The course will focus on Systems of linear equations and matrices, Determinants, Vectors in 2-space and 3-space, Euclidean vector spaces, General vector spaces, Eigenvalues and eigenvectors, and Linear transformations. An introduction to probability theory and statistics, with an emphasis on solving problems in engineering. The second part of the course will focus on Probability and statistics. Topics in probability include discrete and continuous random variables, probability distributions, sums and functions of random variables, the law of large numbers, and the central		

	limit theorem. Topics in statistics include sample mean and variance. Exercises and problems presented in the classes are tailored to help students.
Course Content	1. Systems of linear equations; Row reduction and echelon forms; Gauss Jordan elimination; 2. Matrix operations, including inverses, block matrices; 3. Determinants and their properties, Cramer's Rule; 4. Linear dependence and independence; Subspaces and bases and dimensions; Orthogonal bases and orthogonal projections; 5. Symmetric matrices, positive definite matrices, similar matrices; 6. Eigenvalues and eigenvectors; Matrix diagonalization, matrix exponential; 7. Introduction to probability and statistics. Sample Spaces, Events, Probability. 8. Conditional Probability. Total Probability. 9. Independence. Bayes Rule. 10. Continuous Random Variables. Gaussian Random Variables. 11. Expectation. Variance. 12. Joint Probability for Discrete and Continuous Random Variables. 13. Covariance and Correlation.
Course Intended Learning Outcomes (CILO):	CILO 1: Apply knowledge of mathematics, science, and engineering appropriate to the degree discipline. [POs: a] CILO 2: Identify, formulate and solve engineering problems. [POs: e] CILO 3: Use the techniques, skills, and modern engineering tools necessary for engineering practice appropriate to the degree discipline.[POs: k]

Major Assessment Methods:	Case Study	Role Playing	Student Presentation	Individual project / paper	Group project / paper	Group discussions	Writing Assignment	Exercises & problems	Service learning	Internship	Field study	Company visits	Reading & Writing Assessments / tests	Listening & Oral Assessments / tests
Quiz 60%								✓					✓	
Final 40%													✓	