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 8 – World Histories and Cultures

□ Area 2 – Chinese/Foreign Language   □ Area 9 – Macao, China and other Societies

□ Area 3 – Communication   □ Area 10 – Values, Ethics and Meaning of life

□ Area 4 – Mathematics/Quantitative Reasoning   □ Area 11 – Physical Education

□ Area 5 – Information Technology and Knowledge Society   □ Area 12 – Visual and Performing Arts

□ Area 6 – Physical Science and the World   □ Area 13 – University Life

□ Area 7 – Life Science, Health and the Human Condition

Course Title: (in English, Chinese and Portuguese)	Data Analytics for Electrical and Computer Engineering 電機與電腦工程數據分析 Análise de dados para Engenharia Electrotécnica e de Computadores		
Course code	ECEN3026	Credit Units:	3
Duration:	☑ Semester Course □ Yearly Course	Suggested Year of Study:	Year 3
Grading System:	☑ Letter Grade □ P/NP	Pre-requisite: (if any)	None
Medium of Instruction:		English	
Text Book and Reference			
Course Description:	This course is an introductory course on data analytics and its application in smart energy systems. It covers three major topics: 1) Primary data analytics theory including classification, regression, principal component analysis, etc.; 2) Hands on data analytics experiences with NumPy, Pandas, Matplotlib, & Scikit-learn packages; and 3) Applications in smart energy systems (with a focus on buildings energy systems), in which comprehensive experiments with real building energy data will be included. In this course, students will learn systematic knowledge on data analytics and Python. They will also gain solid hands-on experiences in using Python to analyze smart meter data in energy systems.		
Course Content	1. Introduction: basics of data analytics, internet of things for smart energy, smart building; 2. Theory and techniques: classification, regression, principal component analysis, and visualization; 3. Coding: Python, NumPy, Pandas, Matplotlib, and scikit-learn;		

	4. Practical labs on data analytics for energy systems: energy data visualization, energy consumption profiles classification, fraud or anomaly detection, energy demand and supply forecasting etc.
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] CILO 4: Use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitations. [POs: l]

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
Class Participation / Discussion 10%			✓			✓								
Final Examination 30%								✓						
Assignment(s) Case Study 20%	✓						✓							
Assignment(s) Project 40%					✓	✓								