UNIT LEARNING OUTCOMES (ULO)

CRICOS Provider Code: 03335G | CRICOS Course (BDS) Code: 097290E

CORE UNITS	
1.	**MATHEMATICS FOR DATA SCIENTISTS**
	Recognise the basic concepts, problems and applications of mathematics in data science
	Develop inquiry and quantitative abilities to solve mathematical problems
	Evaluate mathematical problems, identify and innovate solutions
	Demonstrate teamwork skills by working in a group project to arrive at mathematical solutions for problems assigned
	Effectively express the mathematical solutions through writing and making presentations
2.	**INTRODUCTION TO STATISTICS AND PROBABILITY**
	Examine mathematical statistics and provide individual solution using empirical and quantitative skill to problems
	Develop quantitative and computing skills and apply to specific real-life cases and problems
	Analyse a problem situation, choose among various mathematical methods, and develop full and cogent solutions
	Demonstrate teamwork skills by working in a group project
	Write and present solutions with appropriate justification and reasoning
	Develop realistic solutions grounded with analytical competency to real life problems
3.	**INTRODUCTION TO COMPUTER PROGRAMMING**
	Recognise the basic concepts in computer programming and their applications to data science discipline
	Demonstrate skills to write, debug and test computer programs
	Explain the process of software development and propose changes to improve the final software product
4.	**INTRODUCTION TO DATABASES**
	Demonstrate concepts in database systems and their application in business contexts
	Develop inquiry and quantitative abilities to Implement SQL
	Construct a relational database design and data modelling using the Entity-Relationship (ER) model
	Demonstrate communications skills, orally and in writing, in presenting built databases
5.	**LINEAR ALGEBRA**
	Recognise the basic concepts and problems of linear algebra
	Demonstrate quantitative abilities to solve data science
	Solve systems of linear differential equations, and consider possible applications in data science
	Prepare oral and written mathematical presentations

6.	**CALCULUS**
	Demonstrate an essential knowledge of calculus
	Use quantitative and computational skills to solve calculus problems
	Categorise and solve different types of calculus problems
	Demonstrate teamwork skills by working in a group project
7.	**INTRODUCTION TO DATA SCIENCE**
	Examine the basic concepts of data science and applications
	Use quantitative abilities to solve data science problems
	Evaluate and dissect data in different ways
	Demonstrate teamwork skills to formulate solutions for mathematical problems
	Interpret a data set and present findings in oral and written form
8.	**STATISTICAL DATA ANALYSIS**
	Classify and interpret statistical data using quantitative techniques
	Apply quantitative and statistical analysis skills to problems
	Evaluate and manage different types of data
	Interpret a data set and present findings in oral and written form
	Assemble and communicate data in an ethical, transparent, and orally responsible manner
9.	**ADVANCED CALCULUS**
	Demonstrate knowledge of advanced calculus
	Use quantitative and computational skills to solve advanced calculus problems
	Contrast the various types of differential equations
	Demonstrate teamwork skills by working in a project to solve the problem assigned
	Prepare mathematical solutions and defend them in written and oral presentations
10.	**ALGORITHMS AND DATA STRUCTURES**
	Identify the basic data structures and algorithms
	Analyse algorithms and data structures to arrive at appropriate solutions
	Evaluate the object-oriented paradigm as the framework of choice for the design of data structures
	Apply Algorithm Analysis to real-life business problems
	Demonstrate Algorithm Analysis to a diverse audience
11.	**DATA INTEGRATION AND WAREHOUSING**
	Identify the problem of data inconsistency in operation systems
	Use BI tools to build a data warehouse
	Evaluate data warehouse, data mart, and cube concepts
	Demonstrate teamwork skills by working in a group to analyse data and provide solutions

12.	**VISUAL ANALYTICS**
	Demonstrate the basic concepts and problems of visual analytics
	Evaluate the data assigned using visual thinking and visual analytics techniques
	Develop visual analytics applications
13.	**ADVANCED LINEAR ALGEBRA AND APPLICATIONS**
	Demonstrate knowledge of the basic concepts and problems of matrix algebra
	Apply matrix methods to data science problems
	Differentiate different sorts of quantitative techniques for specific types of problems
14.	**PROGRAMMING FOR ANALYTICS**
	Recognise the concepts of programming and R & Python languages for data analysis
	Illustrate the basics of R, different plots, statistics functions, and packages in R
	Use Python as a visualisation tool and develop data analysis models
	Explain data analyses and results to a diverse audience
15.	**CONSUMER BEHAVIOUR AND MARKETING RESEARCH**
	Identify the basic concepts and problems of consumer behaviour and marketing research
	Design and develop market research plans
	Predict and assess trends in consumer behaviour to the marketing of an actual product or service
	Collaborate in a team to create a market research plan
	Defend a research plan to multiple stakeholders
16.	**MACHINE LEARNING**
	Recognise the basic theory and regression models used in machine learning
	Apply classification techniques, clustering techniques, association rules and partitioning methods on a dataset
	Prepare machine learning and data mining projects
	Demonstrate methods and solutions to various audiences
	Design ethical data solutions to real life business problems
17.	**SIMULATION MODELLING**
	Recognise concepts in simulation modelling
	Demonstrate effective data-driven decision making
	Develop Monte Carlo simulation in R
	Collaborate in teams to undertake a simulation modelling project
	Prepare simulation results relating to real business problems

18.	**DATA MINING**
	Identify data warehouse and data analysis techniques
	Manage techniques for analysing data and their application to strategic decision making
	Use BI Studio/tools for business applications
	Design socially and ethically responsible data solutions
19.	**OBJECT RELATIONAL AND NOSQL DATABASES**
	Identify the basic concepts and problems of object relational and NoSQL databases
	Recognise object-relational and NoSQL databases and evaluate their use for the management of complex data types
	Assess the requirements of modern database environments that involve complex data types
	Collaborate in teams to undertake a database project
	Demonstrate the design and implementation of non-relational database to a diverse audience
20.	**SOCIAL WEB ANALYTICS**
	Demonstrate the basic concepts, applications, and problems of web and social networks
	Analyse website traffic and apply social media strategies
	Evaluate the limitations of web-based data and appraise large sensor and network datasets
	Collaborate in a team web analytics project
	Demonstrate web mining solutions to a diverse audience
	Apply ethical principles to real-life business problems
21.	**ADVANCED ANALYTICS**
	Review stream, sensor, and spatio-temporal analyses
	Evaluate data using sensor analytics techniques
	Use sensor and spatio-temporal analyses for decision making
	Collaborate in teams to use advanced analytics
	Demonstrate spatio-temporal analyses to a diverse audience
22.	**BIG DATA PROCESSING TECHNIQUES AND PLATFORMS**
	Recognise big data processing techniques and platforms
	Evaluate data using big data Hadoop technique
	Develop Hadoop algorithms to mine big data
	Illustrate big data analysis to a diverse audience and defend ethical approaches to data analysis of real business problems

FOUNDATION SKILLS AND EMPLOYABILITY SKILLS UNITS	
23.	**FOUNDATION SKILLS 1: PERSONAL & CAREER FOUNDATIONS**
	Explain key concepts associated with personal values and goals, career aspirations, employment trends, and individual pathway opportunities/plans/strategies
	Identify personal strengths and note personal and work trajectories
	Identify and analyse labour and employment trends, and seek support mechanics for empowerment and value-add to decision making
	Demonstrate teamwork skills in group task and activities; appreciate the value of teams
	Appreciate the context and situations around learning, being and becoming
	Develop realistic solutions grounded with analytical and critical competencies to real-life problems
24.	**FOUNDATION SKILLS 2: ETHICS AND MORAL REASONING**
	Explain basic concepts in philosophy and describe terminologies associated with ethics, moral reasoning and virtues
	Understand and engage in debates on ethics and moral reasoning
	Use the skills and processes of philosophical discourse to address critical incidents, and conduct independent inquiry and research
	Demonstrate teamwork skills in group task and activities; appreciate the value of teams and its pertinence in arguments and debates (group consensus)
	Appreciate ethics and moral reasoning transcends culture and society; analyse and critically evaluate arguments and points of view
	Understand the role of philosophy, ethics moral values (and virtues) in everyday life
25.	**EMPLOYABILITY AND PRACTITIONER SKILLS SERIES 1: EMOTIONAL INTELLIGENCE**
	Demonstrate an understanding of personality types and attributes of emotional intelligence and empathy
	Exhibit the skills, knowledge, and understanding gained in order to increase employability and possess the essential qualifications sought in the corporate world
	Display self-awareness, emotional intelligence, and empathy
	Select and use appropriate interpersonal skills and communication tools effectively for communicating in different business situations
	Plan, organise, and participate in group meetings effectively
26.	**EMPLOYABILITY AND PRACTITIONER SKILLS SERIES 2: LEADERSHIP, TEAMWORK, GLOBAL DEXTERITY**
	Demonstrate an understanding of team dynamics, personality traits, and different leadership styles
	Discuss the impact of various socio-cultural factors in effective leadership in a globalised world
	Analyse the relationship between motivation, type of followers, culture code, and team performance
	Engage in analytical discussions and present recommendations and possible solutions in written reports and verbal presentations
	Plan, coordinate and work independently and in teams, to meet deadlines, delivery styles and specified quality standards

27.	EMPLOYABILITY AND PRACTITIONER SKILLS SERIES 3: COMMUNICATING EFFECTIVELY
	Display a good understanding of relevant factors pertinent to negotiation, negotiation styles, and conflict resolution in cross cultural settings
	Research a real cross-cultural business transaction from the aspects of negotiation, parties involved, motivations, and the nature of the outcome
	Critically analyse personal negotiation and selling styles and devise ways to enhance these via listening skills, empathy, inter- personal relationships, cross-cultural dexterity, and effective communication
	Engage in analytical discussions and present recommendations and possible solutions in written reports and/or verbal presentations
	Work in teams and independently to meet deadlines, delivery styles, and specified quality standards
28.	**EMPLOYABILITY AND PRACTITIONER SKILLS SERIES 4: INNOVATION, CREATIVITY AND AGILITY**
	Discuss the concepts, tools, and frameworks for innovation, creativity, and agility
	Adopt innovative creative and strategies while addressing ambiguity in the business environment
	Assess own creativity, innovation style and ability to cope with ambiguity and accordingly prepare a personalised plan/road map to handle future projects that require strategic thinking
	Engage in analytical discussions and present recommendations and possible solutions in written reports and/or verbal presentations
	Work in teams and independently to meet deadlines, delivery styles, and specified quality standards
	Apply strategic thinking using appropriate problem solving, innovation and creativity tools and frameworks to provide a pitch for a new business strategy

CAPSTONE PROJECTS	
29.	**DATA SCIENCE CAPSTONE PROJECT I**
	Illustrate the concepts and problems of data science and its applications to various domains
	Demonstrate inquiry and quantitative skills to solve data science problems
	Formulate a project management plan that utilises data science techniques
	Design written, visual, and oral media to address stakeholder's objectives
	Develop solutions to real-life business problems
30.	**DATA SCIENCE CAPSTONE PROJECT II**
	Illustrate the concepts and problems of data science and its applications to various domains
	Demonstrate inquiry and quantitative skills to solve data science problems
	Devise a technical solution to a significant problem using appropriate tools and techniques
	Collaborate in a team to achieve project goals to the satisfaction of stakeholders
	Present solutions that meets stakeholder's objectives using various media formats
	Develop analytical solutions to real-life business problems