



DIPLOMA IN BIG DATA & ANALYTICS (T60)

Course Overview

Think Netflix, Amazon, Instagram – how do these companies always seem to know what you like or want, even before you do?

Therein lies the power of Big Data, which is taking the business of data-driven decision making to great heights! These organisations use analytics to help make sense of large volumes of data that captures customer preferences and habits.

Through this course, you will learn to work with data using analytics tools to provide insights to understand and improve businesses, products and services. In addition, equip yourself with real-world experience through internships, mentorships and project collaborations with our industry partners.

With Singapore's rising prominence as an international data and analytics hub, you are in prime position to land yourself a rewarding career in this field. Look forward to exciting job opportunities as you will also graduate with industry-recognised certifications that will give you the edge over others in this field!

Get the opportunity to attain the certifications(s) below through your course of study:

- AWS Cloud Practitioner
- DataCamp Certified Data Analyst
- ICDL Data Analytics Certification
- KNIME Certification
- SAS Certificate in Applied Data Analytics

AWS Cloud Practitioner Certification

Many companies are now placing their information on the cloud, as well as creating applications and services on the cloud. Due to cloud computing, we are seeing a big shift from the traditional way businesses think about IT resources. Cloud Computing professionals are in high demand in the IT industry. The AWS Certified Cloud Practitioner offers a foundational understanding of AWS Cloud concepts, services, and terminology.

The School of Informatics & IT curriculum prepares students to acquire the AWS certified cloud practitioner qualification. Industry-recognised certificates give students and prospective employers an added confidence about the cloud proficiency of graduates.

Supported by:

 **aws** academy
Member Institution



COMPETITIVE EDGE

All students will graduate with a Diploma in Big Data & Analytics and a SAS professional certification which provides them with a competitive edge when seeking data analyst jobs.



INTERNSHIPS WITH INDUSTRY LEADERS

Excited to work with the likes of Shopee, eBay, Starbucks, United Overseas Bank, GovTech, CapitaLand and many more? This course offers you just that! Learn from the best as you pursue internship opportunities and gain an invaluable once in a lifetime opportunity.



PRACTICE-ORIENTED LEARNING

Get excellent hands-on experience at the Analytics Innovation Centre set up in collaboration with SAS, which is a leading multi-national company that is renowned for analytics technologies. Here, you will be trained in comprehensive business intelligence and analytics skills in a data-rich environment to give you a distinctive edge when you graduate.

Entry Requirements

Subject	Grade
English Language (EL1)*	1-7
Mathematics (E or A)	1-6
Any two other subjects	1-6
2023 Planned Intake	50
Net ELR2B2 aggregate range (2023 JAE)	5 - 11

To be eligible for selection, applicants must also have sat for one of the following subjects: Additional Combined Science, Additional Science, Biology, Chemistry, Combined Science, Computer Studies, Creative 3-D Animation, Design & Technology, Engineering Science, Food & Nutrition, Fundamentals of Electronics, General Science, Human & Social Biology, Integrated Science, Physics, Physical Science, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry), Science (Physics, Chemistry, Biology).

* Sijil Pelajaran Malaysia (SPM)/ Unified Examination Chinese (UEC) holders must have a minimum of grade 6 for the relevant English Language subject (e.g. Bahasa Inggeris).

Note: Applicants with complete colour vision deficiency are not eligible to apply for this course.

What You'll Learn

YEAR 1

YEAR 2






YEAR 3

TPFUN

Strong Foundation Skills

Learn to develop your own mobile and web applications with the coding and user interface skills you acquire. Also, learn the fundamentals of networking, and discover how to create your own analytics dashboard.

Diploma Subjects - Core Subjects			
Subject Code	Subject	Credit Units	
CIT1C21	Application Development Project This subject will introduce the skills required to develop a web application using the latest technologies. Project design, development and deployment will also be covered.	4	^
CIT1C18	Computational Thinking This subject introduces students to the fundamentals of computational thinking and their application in developing programming solutions for problems. Topics covered include programming concepts, simple data structures and programming techniques.	4	^
CCF1C03	Cybersecurity Fundamentals This subject will introduce the principles of cybersecurity and their application in real world scenarios. It also covers what is required to protect and defend digital systems and applications in cyber space. Common types of cyber risks, threats and attacks, as well as the applicable controls will also be discussed.	2	^
CIA1C11	Data Visualisation and Analytics This subject covers the data analytics lifecycle, including gathering, cleaning, processing and visualising of data. Exploratory data analysis methods, descriptive and predictive analytics and the presentation of insights will also be covered.	4	^

CIA1C06	Database Application Development <p>This subject introduces the fundamental concepts of relational database systems, the design methods specific to relational database, database manipulation using a database query language, and the techniques of implementing relational databases. It will also cover implementation of simple applications to access relational database.</p>	4 
CIT1C14	Data Structures and Algorithms <p>This subject introduces students to the fundamentals of recursion and data structures in solving problems using a programming language. Topics covered include stacks, queues, linked lists and trees. Searching techniques and sorting algorithms will also be covered.</p>	4 
CIA1C07	Logic and Mathematics <p>This subject covers logic, sets, functions, recursion and graphs. It covers mathematical processes for developing algorithms in computing and other real-life applications. Topics covered include the fundamental mathematical concepts needed for computing.</p>	3 
CCF1C04	Network and Cloud Technology <p>This subject covers the theoretical and practical aspects of network and cloud technology. Topics covered include how data is transmitted within an organisation and via the internet, as well as cloud computing technologies, its benefits, organisation, cloud usage, and risks.</p>	4 
CIT1C19	User Experience and Interface Design <p>This subject introduces the concept of Human-Centered Design, and its practice to create useful digital products and interfaces that offer an enriching user experience (UX). The</p>	3 

topics covered include designing interfaces, need findings, sketching and prototyping for interactive experiences, and usability testing.

YEAR 1

YEAR 2

YEAR 3






TPFUN

Provide Business Insights

You will learn how to manage Big Data, such as those that Facebook and Google collect and store. This critical skill will be useful for you in your future careers to analyse how a business or an organisation is doing, and advise them on smarter business decisions.

Diploma Subjects - Core Subjects

Subject Code	Subject	Credit Units
CDA2C02	Data Mining and Business Analytics This subject introduces the fundamental concepts of machine learning. Topics covered include supervised and unsupervised learning and classification.	4
CIA2C14	Data Science Essentials This subject equips students with knowledge and skills in the emerging field of data science. It covers the data science life-cycle, history and context, as well as its landscape. Topics covered include data exploration and analysis techniques to discover new knowledge from data to aid data-driven decisions in an intelligent and informed way.	4
CDA2C04	Data Storytelling This subject covers graphing fundamentals, graphing properties and building dashboards for reporting purposes using relevant statistical modelling and analysis techniques. The subject also introduces the knowledge and skills to apply the data storytelling framework and principles of data visualisation to enable business users to communicate and narrate findings relevant to business contexts.	4

CDA2C01	Data Warehousing and Business Intelligence This subject covers the fundamental concepts and techniques of setting up the data warehouse, its model design and implementation, and how data warehousing enables business intelligence capabilities and effective decision making across many industries. It also covers Business Intelligence (BI) concepts and the techniques of integrating data into useful information, and implementing BI applications to help companies manage their business performance.	4	
CDA2C06	Data Engineering in the Cloud This subject covers the data engineering technologies to build a scalable data pipeline on the cloud to meet business requirements. It includes topics such as data ingestion, data transformation, data processing, data storage, data governance and protection.	4	
CDA2C05	Machine Learning for Decision Making This subject covers the techniques for data driven decision making through a hands-on approach. It includes topics such as the framing of the business problem into a machine learning problem, feature engineering, machine learning model building, model results explanation and application.	4	
CIA2C12	Quantitative Analysis The subject covers linear regression, correlation between a dependent variable and independent variable, analysis of variance, chi-squared tests, two-way analysis of variance (ANOVA) and multivariate analysis.	4	
CIA2E01	Text & Social Media Analytics This subject equips you with the knowledge and skills to process textual data and social media for analytical insight. It covers topics such as social media analytics concepts	4	

and techniques, text analytics process and techniques such as information extraction, text categorisation, cluster analysis and sentiment analysis.

YEAR 1

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YEAR 3

TPFUN

Sparking Transformation

Discover how to 'mine' Big Data for better business insights. Also, undertake more significant and complex projects that equip you with real-world work experience. You can also look forward to meaningful internships in either a local company or an overseas organisation.

Diploma Subjects - Core Subjects

Subject Code	Subject	Credit Units
CMP3101	Major Project This subject involves the integration of knowledge and skills acquired from the various subjects in the course. It helps students develop a practical understanding of the products, methodologies, processes, systems, project management and presentation skills needed for AI related application projects. Students will develop, present and demonstrate solutions to a problem.	10

Diploma Subjects - Elective Cluster Subjects

Advanced Analytics

Subject Code	Subject	Credit Units
CAI2C03	Deep Learning and Object Recognition This subject introduces students to the fundamental principles of deep learning and how it is applied to a collection of computer vision tasks to implement object recognition. It covers the concepts and architecture of convolutional neural networks such as the various layers within, and the hyperparameters involved, using available tools and libraries.	4

CDA2C07

Recommendation Systems

4



This subject introduces the concepts, applications, and algorithms for building recommendation systems. Going beyond explanations and predictions, recommendation systems deliver hyper-personalised experiences to individuals through tailored suggestions for products, services and content. This subject will cover both traditional as well as advanced techniques for building recommendation systems with the use of graph analytics. It will also introduce common metrics used for evaluating recommendation systems.

Advanced Manufacturing Technology



Subject Code

Subject

Credit Units

BLO2010

Distribution Centre Management

4



This subject provides an overview of the role of a Distribution Centre (DC) in the supply chain. It also covers the various activities performed within a DC and the significance of these activities on customer service and total logistics costs. It focuses on the major resources to be applied in a DC and explains how they interact with one another in contributing to the DC's effectiveness and efficiency. It will also cover the significance of providing DC services to the Third-Party Logistics industry.

ECC2014

Industrial IoT Analytics

4



This subject covers the essential concepts and skills needed for implementing digital transformation in smart manufacturing plants. It covers the application of industrial software platforms to wirelessly interconnect sensors, Internet of Things (IoT) devices and equipment. Students will learn to develop dashboard for acquiring, analysing and displaying

data that is commonly found in Advanced Manufacturing. Modern approaches in activation of hardware and software responses when interventions are required for process improvement or corrective actions are also covered in detail.

YEAR 1

YEAR 2

YEAR 3

TPFUN

You will also take this set of subjects that equips you with the crucial 21st-Century life skills you need to navigate the modern world as an agile, forward-thinking individual and team player.

TP Fundamentals (TPFun) Subjects

Subject Code	Subject	Credit Units
CSI3004	<p>Student Internship Programme</p> <p>This structured programme is designed to link your learning with the real work environment. You will be placed in organisation(s) with opportunities to apply the concepts and skills acquired in the course of your study. Besides reinforcing technical concepts and mastering of skills in areas that you have been trained, the practical training will enable you to build important skills such as problem-solving, communication, teamwork, and to cultivate good attitude and a strong work ethic.</p>	16
CTX1001	<p>Effective Communication</p> <p>This subject introduces the fundamentals of effective communication. It also covers how to communicate with and convince an audience through writing and speaking tasks. The skills in this subject will include the application of strategies for communication, appropriate vocabulary, language features, visual aids, tone and style. The Message, Audience, Purpose and Strategy (MAPS) framework will also be applied when planning and engaging in written and verbal communication. There will</p>	3

be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.

CTX1002

Professional Communication

3



This subject covers professional communication skills for the workplace and employability skills in the areas of career preparation. It covers communication and interpersonal skills, including effective virtual communication etiquette, and conducting oneself professionally in the workplace. In addition, essential career preparation skills such as resume writing and interview skills, needed to seek and secure work would be included. The **Message, Audience, Purpose** and **Strategy (MAPS)** framework would also be applied when engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.

GTP1301

Current Issues & Critical Thinking

3



This subject covers current issues, including diverse local and global concerns, that will impact lives and may have critical implications for Singapore. There will be opportunities to build competence through self-directed learning, communicate and collaborate in active discussions and objectively analyse issues using digital and information literacy skills and critical thinking scaffolds.

GTP1201




Career Readiness

1






This subject focuses on personal management skills. It develops an understanding of one's career interests, values, personality and skills for career success. It covers the necessary knowledge, skills and

attitudes needed to succeed in the workplace and achieve professional goals. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning methods, and acquire the skills of being a lifelong learner.

GTP1202	Career Management This subject focuses on career management skills. It covers the importance of workplace readiness skills to adapt and respond to the changing job market environment. Career ownership and continuous learning for lifelong employability will be emphasised. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning, and acquire the skills of being a lifelong learner.	1 
CGS1002	Global Studies This subject provides essential skills and knowledge to prepare students for an overseas experience. They will examine the elements of culture and learn the key principles of cross-cultural communication. In addition, they will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment. The subject prepares students to be responsible global citizens and leaders who can contribute to the global community through effective communication and collaboration.	3 
GTP1302	Guided Learning* The subject introduces students to the concepts and process of self-directed learning in a chosen area of inquiry. The process focusses on four stages: planning, performing, monitoring and reflecting. Students get to plan their individual learning project, refine and execute the learning plan, as well as	3 

monitor and reflect on their learning progress and project. The learning will be captured and showcased through a curated portfolio. The self-directed learning project will broaden and/or deepen a student's knowledge and skills. Students will enhance their problem solving and digital literacy skills through this subject.

CIN1001	Innovation & Entrepreneurship	2	
<p>The subject is designed for learners from all disciplines to embrace innovation in either their specialised field or beyond. Learners will be taught to apply the Design Thinking framework to develop problem statements, ideate and identify feasible solutions. Learners will be exposed to several tools for prototyping. In addition, commercial awareness will be imbued in learners through various innovation and entrepreneurship concepts or tools. This subject also prepares students to be self-directed lifelong learners who are digital and information literate. It nurtures communicative and collaborative citizens who can use objective analysis in problem-solving.</p>			
GTP1101	Leadership Fundamentals	2	
<p>This subject focuses on self-leadership based on the values of integrity, respect, and responsibility. Increasing awareness of self and others will lay the foundations for personal and relationship effectiveness. Consequential thinking, clear articulation of personal values and visions, emphatic listening, and collaboration in serving others are some of the essential skills covered in this leadership journey. There will be opportunities to build and to apply the concepts of being a values-centred leader.</p>			
GTP1102	Leadership in Action	1	
<p>This subject focuses on Service Learning as an experiential platform to</p>			

apply the tenets of Self and Team Leadership. Service Learning will be the capstone project for this subject, which will require an analysis of the diverse needs of the community, collaboration with community partners and demonstration of learning, including key elements of empathy. There will be opportunities to build and to apply the concepts of being a values-centred leader.

LSW1002

Sports & Wellness

2



The subject enables students to build a good foundation for healthy living. Students will have the opportunity to participate in hands-on practical sessions where they will experience and develop both physical and technical skills in their chosen sports or fitness activities. Through a structured curriculum that facilitates group participation, practice sessions and mini competitions, students will be able to build lifelong skills such as resilience, leadership, communication and teamwork. Physical activity sessions will also be supplemented by health-related topics that span the dimensions of health, such as diet, nutrition, stress and weight management, to provide students with a holistic approach to healthy living. This subject also prepares students to be self-directed and accountable for lifelong learning for good health.

TGS1001

Sustainability & Climate Action*

3



This subject prepares students to be responsible global citizens and future leaders who can contribute to the global community. It introduces the topics of sustainability and explores how human societies can act to build a sustainable future. This subject focuses on the impact of climate change, potential solutions to climate change, and the future of the green economy from global and local perspectives.

* Students must choose to take either **Sustainability & Climate Action** or **Guided Learning**.

GRADUATION REQUIREMENTS

Cumulative Grade Point Average	min 1.0
TP Fundamental Subjects	40 credit units
Diploma Subjects - Core Subjects	74 credit units
Diploma Subjects - Elective Subjects	min 8 credit units
Total Credit Units Completed	min 122 credit units