Big Data & Analytics

OVERVIEW

Just how big is Big Data? It is massive! Did you know that Amazon uses big data to start the product delivery process even before the customer clicks on 'buy'? Or that top football clubs analyse opponent data to gain a competitive edge? That's just the tip of the iceberg.

Being a Big Data & Analytics (BDA) student gives you the competitive edge to harness the real power of data analytics and turn you into the go-to person organisations consult to unlock their true potential. You can look forward to an interesting curriculum that covers broad-based topics including: data science, data analysis, data visualisation and storytelling, big data programming and machine learning.

What's more, with Singapore's emergence as an international Data and Analytics hub, you will be in the best position to land a rewarding career as a big data professional.

Your Journey

Year 1

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.

Year 2

Business Insights

You will learn how to manage Big Data, such as those that Facebook and Google collect and store. Apply this critical skill in your future careers analysing how a business or an organisation is doing, before advising them on making smarter business decisions.

Year 3

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.

ENTRY REQUIREMENTS

Minimum Entry Requirements

The minimum entry requirements for the course are as follows:

English Language (EL1)*	Grades 1-7
Mathematics (E or A)	Grades 1-6
Any two other subjects	Grades 1-6

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.*

See also the minimum entry requirements for:

- ITE Certificate Holders
- International Students

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COURSE STRUCTURE

TP FUNDAMENTALS (TPFun) SUBJECTS

Subject code	Subject	Level	Credit Units
CCS1006	Communication & Information Literacy In this subject, you will learn how to conduct research for relevant information and validate information sources. You will also learn to recognise and avoid plagiarism, and follow standard citation and referencing guidelines when presenting information. In the course of learning, you will be required to plan, prepare and present information appropriately in written and oral form. You will also be taught to consider the **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) when writing and delivering oral presentations.	1	2
CCS1007	Workplace Communication In this subject, you will be taught how to conduct effective meetings while applying team communication strategies and the skills for documenting meeting notes. You will be required to write clear emails, using the appropriate format, language, tone and style for an audience. You will also be taught to communicate appropriately in and for an organisation when using various platforms. In all aspects, the principles of applying **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) will be covered.	1	2
CCS1008	Persuasive Communication In this subject, you will be taught how to use persuasive language in written documents. You will be required to use information to your advantage to verbally communicate and convince an audience about your idea, product or service. Skills such as persuasive vocabulary, language features, graphical illustrations, tone and style would also be covered. The **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) will also be applied when engaging in verbal and written communication.	1	2
GCC1001	Current Issues & Critical Thinking This subject presents you with a panoramic view of current local and global issues, which may have long term implications for Singapore. You will learn to apply critical thinking tools to examine current issues, support your views with relevant research and up-to-date data, articulate an informed opinion and mature as civic-minded individuals.	1	2

CIN1001	**Innovation & Entrepreneurship** The Innovation & Entrepreneurship subject is designed for learners from all disciplines to embrace innovation in either their specialised fields or beyond. You will first learn the Design Thinking framework, where you will develop problem statements and ideate solutions. Next, you will discover the tools for prototyping and innovation, such as 3D printing and laser cutting, at TP's Makerspace+ facility. Finally, you will acquire commercial awareness through the LEAN Startup framework of idea crystallisation, prototype building, customer testing and validation, refinement of business model canvas, and crowdfunding or crowdsourcing avenues.	1	2
LEA1011	**Leadership: Essential Attributes & Practice 1** LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.	1	1
LEA1012	**Leadership: Essential Attributes & Practice 2** LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.	1	1
LEA1013	**Leadership: Essential Attributes & Practice 3** LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.	1	1
LSW1002	**Sports & Wellness** This subject will help you develop both the physical and technical skills in your chosen sports or fitness activities. Through a structured curriculum that facilitates group participation, practice sessions and mini competitions, you will learn to build lifelong skills such as resilience, leadership, communication and teamwork. Physical activity sessions will be supplemented by health-related topics to provide you with a holistic approach to healthy living.	1	2
MCR1001	**Career Readiness 1** This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.	1	1

MCR1002	Career Readiness 2 This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.	1	1
MCR1003	Career Readiness 3 This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.	1	1
CGS1002	Global Studies This subject provides essential skills and knowledge to prepare you for an overseas experience. You will examine the elements of culture and learn the key principles of cross-cultural communication. In addition, you will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment.	1	3
CGS1003	Managing Diversity at Work* This subject explores the concepts of identity, diversity and inclusion at the workplace. It examines the relationship between identity and diversity, the benefits and challenges of diversity and the strategies that promote inclusion and inspire collaboration in a diverse workplace. Examples of the elements of diversity covered in this subject include nationality, generation, ethnicity and gender.	1	3
CGS1004	Global Citizenship & Community Development* Students will examine the meaning and responsibilities of being a Global Citizen, in order to contribute towards a more equitable and sustainable world. In addition, students will learn how sustainable solutions can support community development, and, execute and critique a community action plan that addresses the needs of a specific community/cause.	1	3
CGS1005	Expressions of Culture* This subject provides a platform for an understanding of culture and heritage through modes of expression. Students will be introduced to global and local cultures via everyday objects, places and human behaviour seen through time and space. Students will explore issues and challenges in culture and heritage sustainability in community, national and global contexts.	1	3
TGL1001	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 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.	1	3

Subject code	Subject	Level	Credit Units
CSI3004	Student Internship Programme This subject has a structured programme that will help to develop important workplace skills for application in a real work environment. The subject will cover a pre-internship training programme and a mentorship programme with the industry. The subject will also cover the roles and functions of an IT professional in an industry and ability to contribute effectively with a high level of professionalism in the workplace.	3	16

* Students must choose to take either one of these three subjects or TGL1001 Guided Learning.

Diploma Subjects - Core Subjects

Subject code	Subject	Level	Credit Units
CIA1C07	Logic and Mathematics 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.	1	4
CIT1C19	User Experience and Interface Design 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 topics covered include designing interfaces, need findings, sketching and prototyping for interactive experiences, and usability testing.	1	4
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.	1	3
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.	1	4
CMC1C08	Network Technology This subject covers the theoretical and practical aspects of networking and its related technologies. Topics covered include network protocols and communications, Ethernet networks, TCP/IP networking model, IP addressing, virtual local area networks (VLANs), routing and switching concepts and static and dynamic routing.	1	4
CCF1C02	IT Systems Security Essentials This subject introduces students to the key principles of information security namely confidentiality, integrity and availability and their application in various real world scenarios. Topics covered include IT law, international standards, security policies, procedures, processes to protect IT systems against cyber-attacks and information breaches and the architecture and organisation of the digital components of a computer system.	1	4

CIA1C06	Database Application Development 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.	1	3
CIT1C20	Coding and Development Project This subject introduces students to coding principles and practices using an object-oriented approach. The subject also introduces the development of an IT application using the latest technologies. Topics covered include object and classes, composition, simple data structures, application architecture, design and development.	1	4
CIT1C14	Data Structures and Algorithms 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.	1	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.	2	4
CDA2C02	Data Mining and Business Analytics The subject covers data exploration and transformation techniques to prepare data, data mining techniques (such as cluster analysis and association analysis) to extract previously unknown patterns and relationships from data, predictive modelling techniques (such as regression, decision tree and neural network) to predict future trends and behaviours, and to use of the insights gained to drive decision making for businesses.	2	4
CDA2C03	Big Data Architecture and Programming This subject covers the emerging data architectures and programming that is driven by big data adoption. It introduces new paradigms of data system within the realm of big data, as well as programming languages for big data collection and processing. The subject also introduces the knowledge and skills to store and apply structured and unstructured data in the context of big data integration.	2	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.	2	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.	2	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.	2	4
CIG2C06	Data Security and Governance This subject covers data security and governance as a quality control discipline for assessing, managing, using, improving, monitoring, maintaining, and protecting organisational information. The subject will cover concepts and impart skills in topics such as data security and access, data protection, data policies, business process management, and risk management surrounding the handling of data in an organisation.	2	4
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.	3	10

Diploma Subjects - Elective Subjects

Subject code	Subject	Level	Credit Units
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 and techniques, text analytics process and techniques such as information extraction, text categorisation, cluster analysis and sentiment analysis.	2	4
CIA3E01	Applied Data Science in a Business Domain This subject introduces how data science is used in the various industries (e.g. Financial Services / Retail / Logistics) to develop actionable insights for better decision making to improve businesses. It provides opportunities for students to integrate and apply their skills acquired through the various modules for this end-to-end implementation in specific business domain. Project management and agile methodologies will also be introduced in this subject.	3	4

CDA2E04	Web and Mobile Analytics This subject will cover topics such as the underlying concepts of web and mobile analytics, and related issues, trends and best practices. Measurement and analysis of metrics and application of analytics to search engine optimization and marketing across mobile and web platforms will also be discussed.	3	4
CIT3C15	Machine Learning for Developers This subject covers the fundamentals of machine learning principles and practices. Supervised and unsupervised learning, neural networks and deep learning will also be covered.	3	4

Graduation Requirements

Cumulative Grade Point Average	min 1.0
TP Fundamental Subjects	40 credit units
Diploma Subjects - Core Subjects - Elective Subjects	72 credit units min 8 credit units
Total Credit Units Completed	**min 120 credit units**