DIGITAL BUSINESS SECOND MAJOR CURRICULUM AND COURSE DESCRIPTION

- BBM and Non-BBM students are required to complete 3 units of core courses and 5 units of electives.
- The list of electives is not exhaustive and subject to change. Students are advised to use the "class search" option in BOSS to browse the full list of course offered.
- The course description for core courses, and elective courses in Basket A and Basket B are in the Appendix.
- Updated 27 April 2026.

DIGITAL BUSINESS SECOND MAJOR CORE – 3 COURSE UNITS

BBM and Non-BBM students are required to complete the following courses:

1. MGMT236 Managing Strategic Change and Digital Transformation
2. IS111 Introduction to Programming* or COR-IS1704 Computational Thinking and Programming*[@] or CS101 Programming Fundamental I or IS112 Data Management[#] or IS105 Business Data Management[#]
3. IS215 Digital Business: Technologies & Transformation**

Notes:

**IS111 Introduction to Programming will be replaced by COR-IS1704 Computation Thinking and Programming from AY24-25 Term 2.*
***Note that IS215 Digital Business: Technologies & Transformation has a pre-req of IS111/CS101/COR-IS1704.*
[@] Computational Thinking and Programming is also a Core Curriculum course, under the Capabilities-Modes of Thinking basket. Students may not double count this course towards both the Core Curriculum and the Digital Business Second Major.
[#]IS112 Data Management is the version intended for SCIS students, while non-SCIS students can take IS105 Business Data Management.

For BBM and other non-SCIS students, they may either:
• take COR-IS1704 to fulfil the DB Core and take an additional course to fulfil Modes of Thinking, ***or***
• take IS105 to fulfil the DB Core and use COR-IS1704 to fulfil Modes of Thinking.
For SCIS students, IS112 can be used to fulfil the DB Core, while COR-IS1704 can fulfil Modes of Thinking (compulsory for IS/SE/C&L students). For CS students, they may use CS101 or IS112 for DB core.
COR-IS1704 is a pre-requisite for compulsory IS215 Digital Business: Technologies and Transformation. Digital Business Major students are still required to take it.

DIGITAL BUSINESS SECOND MAJOR ELECTIVES – 5 COURSE UNITS

Students are required to complete 5 CUs of Digital Business Second Major Electives. These must include 2 CUs from the following:

- FNCE101 Finance/ FNCE103 Finance for Law/ FNCE104 Financial Management
- ACCT101 Financial Accounting/ ACCT105 Financial Accounting for Law
- MKTG101 Marketing

- COR-MGMT1304 Management Communication [@]
- OBHR101 Management of People at Work
- OPIM201 Operations Management
- MGMT102 Strategy

[@] Management Communication is also a Core Curriculum course, under the Capabilities-Managing basket. Students may not double count this course towards both the Core Curriculum and the Digital Business Second Major. If Management Communication is used to fulfil Capabilities-Managing basket, then you should take another course from the above list (e.g. Marketing, Management of People at Work and etc.)

Students may fulfil the remaining requirement by completing 3 other Digital Business Electives (2 from Basket A and 1 from Basket B), such as:

Basket A (Complete 2 CUs)

- COR-MGMT2238 Doing Business with Artificial Intelligence
- FNCE313 Financial Innovation, Blockchains and Decentralised Finance (Previously known as Financial Innovation)
- MKTG220 Digital Marketing
- COMM255 User Experience and Digital Product Design ^ (Previously known as Interaction Design Communication) (mutually exclusive to IS211)
- MGMT345 Digital Media, Entertainment & Ecommerce Ecosystem (Previously known as Digital Strategy in the Digital Media and Entertainment E-Commerce Ecosystem in Asia)
- ACCT428 Digital Transformation in Accounting (Personalised Learning)
- OBHR225 Technology Solutions for Human Resources*
- MGMT245 Digital Business Transformation across Asia Practicum
- OPIM347 Shipping Strategies – the Digital Dimensions (SSDD) (Previously known as Shipping Strategy – The Global and Digital Challenges) **
- COR-MGMT2239 An introduction to Artificial Intelligence: Implications for Work and Business Models
- OPIM349 E-Commerce and Marketplace Operations
- MKTG236 Digital Marketing Strategy (only for (TREBLE) students)
- COR-PHIL2257 Ethics of Artificial Intelligence
- MGMT248 Strategy in the Age of AI and Big Data
- IS4000 Application of AI in Financial Services

*Only students who have taken the course from AY23-24 T1 onwards will be able to cross-list to Digital Business Elective A.
** Only students who have taken the course from AY23-24 T2 onwards will be able to cross-list to Digital Business Elective A.

Basket B (Complete 1 CU)

- IS210 Business Process Analysis and Solutioning
- IS211 Interaction Design and Prototyping^ (mutually exclusive to COMM255)
- IS468/SMT112 Sustainable Digital Cities
- IS425 Digital Transformation Strategy
- IS217 Analytics Foundations
- IS458 Cloud Management and Engineering
- IS462 Virtual Reality for Business

- CS427 AI Safety
- COR-CS2232 Internet of Things Innovations for Driving Business Growth
- IS447 Smart Healthcare in Asia
- IS463 Digital Technologies for Environmental Sustainability
- IS464 Data Analytics and Technology Guided External Course
- IS466 Digital Ethics for Responsible Computing
- SMT201 Geographic Information Systems for Urban Planning
- IS469 Generative AI with Large Language Models
- SE201 AI-Driven Software Engineering
- CS467 Open Source Software Systems
- IS461 AI Governance

^ COMM255 User Experience and Digital Product Design (only for Basket A) is mutually exclusive to IS211 Interaction Design and Prototyping (only for Basket B). If you have taken Interaction Design and Prototyping, then you will not be able to take User Experience and Digital Product Design.
Students will not be able to double count course(s) with COR towards both the Core Curriculum and the Digital Business Second Major.

Appendix: Digital Business Second Major – Course Descriptions
(Please check Course Catalogue in BOSS for updated information!)

CORE COURSES

1. **COR-IS1704 Computational Thinking and Programming**
   This course equips students with both foundational computer programming skills and computational thinking skills, through the use of Python, a widely-used programming language. Upon successful completion of this course, students will understand and be able to appropriately apply fundamental programming concepts including variables, functions, parameters, loops and conditions to solve computational problems. The students will also be introduced to basic data structures including arrays (lists in Python) and hash tables (dictionaries in Python). In addition, students will receive a gentle introduction to computational complexity and apply the notion of complexity to analyse simple algorithms.

   Prerequisite(s): Nil
   Mutually Exclusive: CS101 Programming Fundamentals I

2. **CS101 Programming Fundamentals I**
   This course introduces students to computational concepts and basic programming. Students will learn the basic programming constructs, and programming techniques to solve problems. An imperative language called C is used as the vehicle of exploration. There is an emphasis on producing clear, robust, and reasonably efficient code using top-down design, and effective testing and debugging.

   Prerequisite(s): Nil
   Mutually Exclusive: COR-IS1704 Computational Thinking and Programming

3. **IS112 Data Management**
   This course will cover fundamentals of relational database theory, important data management concepts such as data modelling, database design, database implementation in current business information systems, and some basic concepts related to unstructured data. A series of in-class exercises, tests, pop quizzes and a course project will help students understand the covered topics. Students are expected to apply knowledge learned in the classroom to solve many problems based on real-life business scenarios, while gaining hands-on experience in designing, implementing, and managing database systems. Students are also expected to understand the differences between structured data and unstructured data. This course is applicable to students declaring a major from SIS.

4. **IS105 Business Data Management**
   This course will cover the fundamentals of relational database theory, important data management concepts such as data modelling, database design, database implementation and searches in unstructured data (i.e., text) in current business information systems for non-SCIS students. Students are expected to apply knowledge learned in the classroom to solve many problems based upon real-life business scenarios, while gaining hands-on experiences in designing, implementing, and managing database systems.

5. **IS111 Introduction to Programming – No longer offered**

This course is intended for any student who wishes to gain some programming fundamentals, also known as the building blocks of Information Systems. The course introduces students to fundamental programming concepts and constructs, explains the process of developing a basic software application, and explains the basic concepts of object orientation. The student will experience the implementation of a basic software application. Python, a widely-used, high-level, general-purpose and interactive programming language, is used as the vehicle of exploration in this course.

6. IS.215 Digital Business: Technologies & Transformation

This course introduces students to the fundamentals of digital business, technologies and the principles and practices that lead to successful digital transformation. With the exploitation of digital technologies such as artificial intelligence, cloud, analytics, mobile networks, social media, and the Internet of Things, organizations can develop a competitive edge that can boost efficiency and drive new business models that lead to an increase in the top and bottom lines. The course focuses on digital strategies using four components namely reimagining the business, re-evaluating value chain, reconnecting with customers and rebuilding the organisation. Challenges such as data security and governance, regulatory constraints, and future directions of digital business will be discussed. Besides helping students to understand the key concepts, tools and API services are introduced to implement the digital and analytics solutions. Real world examples and case studies of how organizations innovate and drive digital transformation will also be covered.

Prerequisite(s): COR-IS1704 Computational Thinking and Programming /IS111 Intro to Programming / CS101 Programming Fundamentals I

7. MGMT236 Managing Strategic Change and Digital Transformation

To achieve superior performance in an increasingly dynamic and uncertain global business environment, companies in every industry must create internal capability to harness strategic change for sustainable competitive advantage. However, companies that are able to strategically change their entrenched ways of doing things and then reclaim leading positions are the exception rather than the rule. With the industry 4.0 upon us and fast advancement in digital technologies, firms in many industries would find it even more pressing but challenging to build the managerial capabilities to cope with the digital transformation that will reshape the business landscape tremendously for the future. Against this backdrop, this course discusses how companies can effectively manage the strategic change and digital transformation that will significantly impact the way the business is configured for competitive advantage. Besides the internal managerial challenge, the course also emphasises that companies must cope with strategic interactions with different industry players to create value collectively and continuously. With respect to digital transformation, the course discusses digital concepts and technologies such as omni-channel, platforms, eco-systems, blockchain, IOT, AI, and cloud computing etc. that impose both challenges and opportunities for strategic change management in the increasingly technology-based, internet-based, and data-based business contexts.

Prerequisite(s): Any 2 CUs from the following: FNCE101 Finance / FNCE104 Financial Management/FNCE103 Finance for Law; ACCT101/111 Financial Accounting/ACCT105Financial Accounting for Law; MKTG101 Marketing; COR-COMM1304 Management Communication; OBHR101 Management of People at Work; OPIM 201 Operations Management; MGMT102 Strategy

ELECTIVE COURSES BASKET A

1. ACCT428 Digital Transformation in Accounting (Personalised Learning) (ACCT428)

   Digital technology affects almost all aspects of modern life from individuals to societies, from economies to cultures—and changes the world. Rapidly changing technological, economic and thinking means digitalisation for accounting profession has become a necessity rather than a choice. Traditional accounting methods (such as paper, receipts, registration, declaration, notification, etc.) are gradually replaced by internet-based accounting systems (such as cloud-based system and blockchain technology).

   The effects of artificial intelligence, blockchain technology, the Fourth Industrial Revolution and cloud system software, on the future of accountancy are being discussed regularly. Questions like, "What new opportunities will these technologies create in accountancy?", "How will digitalisation and technology affect the accountancy profession and professionals?", and "Is the accountancy profession and professionals ready to change?" are being discussed in the accounting industry.

   In the near future, many accounting transactions will be processed by artificial intelligence and automation systems. Business owners will need to start looking for more technological talent in accountants. It is an unquestionable fact that the language of the next generation of accountancy professionals will be digitalisation and technology. Recognising digitalisation technologies and managing digital systems effectively is of critical importance for the accountancy profession's future.

   This self-directed personalised learning course aims to achieve the following objectives:

   • Promote student agency
   • Learn 'how to learn' so as to nurture students to become lifelong learners
   • Active mentoring by faculty
   • Understand how digital technologies may impact accounting at individual, organizational and industry levels
   • Understand how digital technologies may simplify, streamline and harmonize essential accounting processes to create a leaner and more efficient finance function

   In this course, the learning process involves (1) blended learning of based-line domain knowledge, (2) creating learning path: (i) participating in learning space(s), (ii) connecting in learning communitie(s) and (3) active mentoring by instructors.

   Prerequisite(s): EITHER ACCT337 Statistical Programming OR ACCT418 Data Modelling & Visualisation AND Cumulative GPA >= 3.40

2. COMM255 User Experience and Digital Product Design

   This course prepares students to design and manage effective digital products by combining product design (UX/UI), user research, and product management methods. You'll learn practical techniques—such as usability evaluations, writing product requirement documents, creating low-fidelity prototypes in Figma, and strategic feature prioritization—drawing from real-world examples from companies like Netflix and Microsoft. As an introductory course, it focuses on human-centered design principles while teaching you to navigate the balance between user needs, business goals, and stakeholder expectations from a strategic perspective. No coding experience required.

Prerequisite(s): Nil
Mutually Exclusive: IS211 Interaction Design and Prototyping

3. FNCE313 Financial Innovation, Blockchains and Decentralised Finance
   This course introduces current disruptive innovations in financial markets to prepare students for the evolving financial industry of the future. The course will cover the main areas of financial innovation with an emphasis on Decentralised Finance and Blockchains. The industry applications include Digital Money, Payment Services, Smart Contracts, Digital Assets Trading, Lending, Capital Raising for Entrepreneurs, and Investments. The course will shed light on the current industry demand for young talent. It will also serve as a guideline for needed skills to navigate and disrupt financial markets in the coming years.

   Prerequisite(s): FNCE101 Finance or FNCE103 Finance for Law or FNCE104 Financial Management

4. COR-MGMT2238 Doing Business with AI
   More and more business organizations are using A.I. technologies such as predictive analytics, deep learning or sentiment / image analysis to identify patterns and trends in vast reams of (big) data, allowing them to make 'smarter' decisions (e.g. about loss of customers or the necessary service inspection of equipment) and potentially to become more competitive in real-time. As A.I. technology is already surpassing human decisionmaking in certain instances, there is growing concern about 'uncontrolled A.I.' in business and society, incl. regulatory and ethical-legal challenges. Against this background, this new course aims to equip students with foundational, theoretical and practical knowledge about A.I. driven business applications in selected private and public sector organizations. Besides reconstructing the history of artificial intelligence from the 1960s to the current era (as well as a refresher about the basics of computer science algorithms such as audio and video compression algorithms), we will put emphasis on explaining the A.I. driven business models of several top international and local organizations. In order to appreciate the power of A.I. technology, we will take a closer look 'under the A.I. hood' to understand what makes machine learning, deep learning, neural networks and image analysis tick. Visits to A.I. powered business organizations engaged in customer service management, finance, marketing, supply chain management or manufacturing will be organised aimed at appreciating both the benefits and downside of A.I. Students graduating from this course will be equipped with critical competencies to solve real-world business problems using A.I. technology while simultaneously casting a critical eye on the morality and ethics of commercialising A.I

   Prerequisite(s): Nil
   Mutually Exclusive: COR-MGMT2239 Artificial Intelligence Fundamentals for Innovation and Business

5. MGMT345 Digital Media, Entertainment & E-commerce Ecosystem
   This course is designed to help students develop an in-depth understanding and analysis of strategic business challenges and opportunities in the dynamic and complex environment of Digital Media and Entertainment E-Commerce Ecosystem (DMEEE) in Asia. Value co-creation is an integral performance outcome in digital platform ecosystems. In developing their digital strategies, leading companies in these systems increasingly aggregate and analyze data from both e-commerce activities and media content consumption to gain a multifaceted understanding of their customers, and to develop deep knowledge about media, entertainment, and e-commerce. As tech titans like Amazon, Netflix, Alibaba, Tencent, and

Bytedance redefine the DMEEE landscape in Singapore and Southeast Asia, other ecosystem players including media firms, entertainment firms, manufacturers and retailers are presented with the challenge of developing their own digital strategies to thrive. This elective will introduce key concepts in strategic management in DMEEE and involve students in real-life strategic business challenges from Corporate Clients.

Participants will have the opportunity to engage business leaders in project discussions.

Prerequisite(s): Nil

6. MKTG220 Digital Marketing

The development of new digital technologies has fundamentally changed how consumers interact with brands and each other. Marketing is no longer about pushing a sales message to a potential buyer. Businesses have to enable conversations with consumers to engage prospects with relevant content that will lead to positive actions for commercial impact.To be effective, marketers need to employ a rigorous and holistic marketing methodology across both traditional and new-emerging techniques. This course will provide students with the relevant knowledge, perspectives, and practical skills required to develop marketing strategies that leverage the opportunities inherent on digital platforms, including social media and consumer-to-consumer social interactions. The emphasis of this course is on understanding the various digital platforms available, how to build social marketing strategies, and how to track their effectiveness. The course utilizes applicable theory, empirical analysis, and practical examples to develop the key learning points. The class format will include a combination of lectures, case study discussions, and guest speakers with relevant industry experience.

Prerequisite(s): MKTG101 Marketing
Mutually Exclusive: MKTG236 Digital Marketing Strategy

7. OBHR225 Technology Solutions for Human Resources

The use of technology to facilitate and enhance Human Resource Development and Management is becoming commonplace. This course is a study on how technology can be used strategically to benefit HRM/HRD in the work place. Using a multi-disciplinary approach, this course covers how technology is used in each step of the HR Life Cycle from recruitment to performance management to resignation and retirement. When deployed strategically to enhance the HRM/HRD function, technology solutions and off-the-shelf software can bring immense value to the company, government organization and NGO. It helps the organization increase productivity, reduce costs, and improves employee morale and job satisfaction.

In line with digital transformation, this course aims to explore how to use various digital technologies and digital platforms (e.g. SaaS) to support the various HRIS functions with the aim of helping HR practitioners achieve most cost-effective HRIS implementations.

In addition to the use of technology to support the HRM/HRD function, this course also aims to cover the use of HR analytics to provide an organization with insights for effectively managing employees so that business goals can be reached. The module will also cover the deployment of technology for best-practice HR, and in-sourcing and outsourcing of HR functions, including some of the latest technology tools like chatbots that are deployed for HR work. Examples from actual HRM/HRD mini case studies will be covered to provide a practice-oriented approach to students; some of these examples are especially relevant to the latest

global advancements as companies implement more technology projects in robotics and Artificial Intelligence, and as countries battle Covid-19 (e.g. WFH policies).

Prerequisite(s): OBHR101 Management of People at Work

8. MGMT245 Overseas Project Experience (Digital Business Transformation across Asia Practicum)

A recent HBR report revealed a daunting 87.5% average digital transformation failure rate. This high failure rate could have been attributed to factors like inability to navigate the digital transformation initiatives through uncertainties and continuously reinvent themselves. Consequently, business leaders are fervently seeking new avenues for growth, be it through market expansion or a profound recalibration of their digital business strategies.This course will allow students to focus on the role of digital marketing, combined with other digital tools to help Southeast Asia businesses to transform their marketing & business strategies and design & test digital business strategies to improve their competitiveness and business performances in the digital age. It hones students' problem-solving skills and prepares them for the complex regional business environment today.Let's set our sights on Malaysia, a key economic contributor to the ASEAN region. While Malaysia's 2024 GDP per capita (purchasing power parity) of US$34,072 places it as the third richest country in Southeast Asia, its digital economy is its most dynamic growth engine. The country's prime industries include manufacturing, oil and gas, and services, but it is the rapid expansion of the digital sector that presents significant opportunities. These growth opportunities align perfectly with a focus on online retail:• Explosive growth in e-commerce: Malaysia's e-commerce market is projected to reach US$8.79 billion in 2025, driven by a growing preference for online shopping and an increase in smartphone and internet penetration. Revenue is expected to show an annual growth rate (CAGR 2025-2030) of 7.54%, resulting in a projected market volume of US$12.64bn by 2030.• Expansion of online retail beyond the Klang Valley: There is a major opportunity to increase regional market penetration and brand visibility by expanding online order fulfillment across West Malaysia to cities like Ipoh, Penang, and Johor.• Development of digital and social commerce: The rise of live-stream selling platforms like TikTok Shop, Shopee Live, and Lazada Live offers a direct channel to reach a wider, younger, and more digitally engaged audience, driving immediate conversions and building customer relationships.Malaysia is well-positioned to take advantage of these growth opportunities and become a leader in the ASEAN digital economy.In addition to the traditional industries, Malaysia has a flourishing digital economy. The country is home to a number of start-ups and tech companies and is attracting significant foreign investment, particularly in the e-commerce and fintech sectors. This vibrant ecosystem provides a strong foundation for online businesses. The government's focus, through initiatives like the Malaysia Digital Economy Corporation (MDEC), is to boost digital transformation, empowering businesses to leverage technology. This environment is highly favorable for live-stream selling, as it supports the adoption of new platforms and technologies that enable direct engagement with consumers.Overall, Malaysia is a dynamic and growing economy with a bright future. The country has a young and digitally savvy population, a favorable business environment, and a rapidly expanding e-commerce landscape. This makes Malaysia an ideal market for an online retail business focused on digital sales channels and regional fulfillment. By capitalizing on live-stream selling and expanding delivery networks, the business is well-positioned to become a major player in the Malaysian online retail space.

Prerequisite(s): Any 2 CUs from the following: FNCE101 Finance / FNCE103 Finance for Law/ FNCE104 Financial Management; ACCT101/111 Financial Accounting/ACCT105Financial Accounting for Law; MKTG101 Marketing; COR-COMM1304 Management Communication;

OBHR101 Management of People at Work; OPIM 201 Operations Management; MGMT102 Strategy

9. OPIM347 Shipping strategies – The Digital Dimensions

   The fundamental idea of the course is that digitalization is fueling a transformation of the maritime eco-system including new and altered relations between shipping companies and customers, competitors, authorities and sea/shore based employees. We focus on the future role of digitalization as a critical component in the present and future of the maritime sector, not only in a technological manner but also as a strategic, cultural and political enabler of change. The course will be centered around three fundamental questions:1) How can maritime strategies be developed and excuted when the maritime ecosystem is transformed by digitalization? 2) How and why do maritime strategies and business models change in a maritime ecosystem transformed by digitlaization? 3) How and why does digitalization affect various shipping segments in different ways?

   Prerequisite(s): NIL

10. COR-MGMT2239 An introduction to Artificial Intelligence: Implications for Work and Business Models

    In only a short few years, Artificial Intelligence (AI) has greatly impacted on people's lives and businesses. However, besides anecdotes, not as much is known about how AI can be used to achieve novel applications, let alone its limitations, and how it differs from human intelligence. This course will focus on all three of these points: The course develops a structured understanding of contemporary AI systems such as Large Language Models (e.g. ChatGPT). It examines the capabilities and limits of AI, and contrasts machine intelligence with human intelligence. This helps clarify where AI complements, substitutes for, or fundamentally differs from human judgment and creativity. Secondly, we explore how AI can be used as a source of innovation in established firms and startups alike. While there has been a surge in AI based entrepreneurial activity, many such ventures struggle or even fail. The course examines selected cases of firms creating value with AI. We examine how strategic positioning, value creation, and business environments can affect business outcomes. Thirdly, as part of value creation, AI is being used in various applications with outputs in the form of language, images and video. The course uses AIs like ChatGPT to create illustrative innovations, including the use of it to generate ideas and partial prototypes. These will be aligned to a design process to show AI augmentation of these functions. The course does not have prerequisites, and does not employ mathematics or computational programming (but AI platforms for AI coding may be used). AI applications like ChatGPT are used heavily, and students are expected to use them at deeper than simple surface prompting levels (e.g. students may be taught and expected to use more advanced prompting methods, or to critically evaluate AI applications). The readings are cross-disciplinary, and may include excerpts from computer science articles, hence basic terminology and concepts from computer science are expected to be learnt and applied.

    Mutually Exclusive: COR-MGMT2239 Artificial Intelligence Fundamentals for Innovation and Business

11. OPIM349 E-Commerce and Marketplace Operations

    With the convenience of the Internet at our fingertips, e-commerce has grown into a huge industry and the world of business is changing rapidly beyond brick and mortar. Customers not only shop through different retail channels - in store, on the web, and through Apps on mobile devices, but also expect a consistent buying experience across these channels. This

creates a host of new business models, such as online marketplaces, online platforms, and omni-channel retailing, that require new sets of skills and concepts to manage. The objective of this course is to provide students with these necessary skills and concepts. Topics that will be discussed include online retailing, online marketplaces, analytics and AI, logistics and technologies for online retailing, service-oriented platforms, and omni-channel retailing.

Prerequisite(s): OPIM101 Decision Analysis

12. MKTG236 Digital Marketing Strategy (only for (TREBLE) students)

In the era of new digital technologies, the focus of marketing has shifted. It's no longer about selling a product or service but engaging with customers through relevant content and encouraging interactions that positively impact business. This advanced course recognizes this shift and is designed to equip students with a comprehensive understanding of digital marketing, incorporating established and emerging strategies.

This advanced course is delivered using an SMU-X learning approach. SMU-X is an experiential learning framework that calls for students to take on real-world challenges by collaborating on projects with corporations, non-profits, and government organizations. The framework represents a paradigm shift in the traditional teaching and learning approach, from teacher-centered to students taking ownership of their learning.

The course offers a comprehensive blend of theory, empirical analysis, and practical examples to reinforce key concepts related to digital marketing. Students will apply their knowledge to develop a digital marketing strategy for a real industry partner. We will collaborate with a real industry partner and offer consultancy services to recommend relevant digital marketing strategies for a real business problem.

With engaging seminars, case study discussions focusing on global brands, insights from industry experts with rich international business experience, and hands-on real business projects, students will sharpen their problem- solving skills to tackle real-world business problems through interdisciplinary approaches and activities. They are guaranteed an interactive learning experience that is informative and relevant to working for global businesses.

Do note that MKTG236 Digital Marketing Strategy follows the SMU-X experiential learning framework. It combines academic with experiential learning through the use of a project from an industry partner. Students need to take ownership of their learning. It is not designed to offer any software development training sessions and does not cover any IT programming. It is a contemporary marketing module to prepare students to join the marketing industry as a marketer.

Prerequisite(s): MKTG101 Marketing
Mutually Exclusive: MKTG220 Digital Marketing

13. COR-PHIL2257 Ethics of Artificial Intelligence

Artificial intelligence raises profound ethical questions: Who bears moral responsibility for AI-caused harm? When is bias in AI systems objectionable and how can it be mitigated? Will our lives be enhanced or diminished by technological unemployment? Is there something special about the ‘human touch’ or is AI able provide the same level of care as human nurses and doctors? This course examines these (and many more) important questions by engaging with

the ideas, theories, and arguments of ethicists, moral philosophers, and public intellectuals. Students will develop ethical reasoning skills essential for any field where AI plays a significant role. By the end of this course, you will have cultivated a framework for thinking critically about AI's impact on society—one that prepares you not only to navigate an AI-driven world but to help shape it responsibly and thoughtfully.

14. MGMT248 Strategy in the Age of AI and Big Data

    This course builds on core strategy insights and introduces students to the use of big data analytics and AI tools in strategic decision making. The course is hands-on, with a strong emphasis on working with actual data and performing analysis. It marries content topics in business and corporate strategy with analytical tools that are appropriate for strategic decisions. Each session requires students to engage with datasets prior to class.The goal is not only to understand how to use the tools, but more importantly how to interpret the results and apply them in real strategic contexts. The teaching assistant who will support the course and the instructor will help students with software setup and execution.

    Co-requisite(s): MGMT102 Strategy & COR-STAT1202 Introductory Statistics /1203 Introduction to Statistical Theory

15. IS4000 Application of AI in Financial Services

    The Application of AI in Financial Services is an SMU-X experiential course delivered in partnership with Union Bank of Switzerland (UBS), providing students with immersive learning opportunities that bridge academic theory with industry practice. Students collaborate directly with UBS professionals to tackle authentic business challenges in financial services, developing innovative AI-driven solutions across domains such as trading, risk management, and banking operations. Generative AI will be the enabling technology for the course.Working in multidisciplinary teams under faculty mentorship, students engage in a comprehensive project lifecycle—from initial problem scoping and stakeholder analysis through solution design, development, and final client presentation. This industry-embedded approach ensures students gain practical experience with cutting-edge AI technologies, i.e. large language models (LLMs), while understanding their real-world application constraints and business impact within the financial services sector.

    Prerequisite(s): CS101 Programming Fundamentals I/ COR-IS1704 Computational Thinking and Programming/ ACCT337 Statistical Programming

ELECTIVE COURSES BASKET B

16. IS210 Business Process Analysis and Solutioning

In practice, a management decision to invest in business process modeling is often motivated by the need to document requirements for an information technology project. So this course aims to help students:
- Understand and apply BPM project needs and life-cycle stages
- Gain knowledge of business process and its role in an industry.
- Understand business models and create models for the as-is business process.
- Understand analysis techniques static and dynamic and analyse the business process
- Apply dynamic analysis techniques using tools and analyse the simulation results
- Identify business needs in the process and convert them to the IT needs
- Understand techniques for solutioning and design solution models for the to-be process
- Understand enterprises and they are implemented in an organization.
- Gain understanding of the process innovation and identify the needs for process innovation.
- Analyze and review innovated business processes in industry cases where digital transformation is applied.

Prerequisite(s): Nil
Mutually Exclusive: IS304 Process Modelling and Solutions Blueprinting

17. IS211 Interaction Design and Prototyping

This course introduces fundamental human-computer interaction principles and techniques for designing usable interactive systems. Topics include common methods for gathering user requirements, basic UI and graphics programming techniques, and common evaluation techniques. Hands-on experience with UI prototyping tools will be provided and students will complete a UI design and prototyping project as part of this course.

Prerequisite(s): Nil
Mutually Exclusive: COMM255 User Experience and Digital Product Design

18. IS217 Analytics Foundation

The term “Analytics” has been around in the business settings for a while now, where past results have been used to guide and improve future performance of business. More recently, enhancements in technology have enabled the business world to produce and store very large amounts of data which needs to be processed, managed and analysed in order to uncover its hidden value. There is a real dearth of analytical talent needed to perform this task. This course aims to introduce students to the fundamental skills needed to get started with analytics.

This course will help them build a foundation needed for advanced analytics by introducing them to data exploration techniques, data preparation methodologies, applying key analytics techniques and use them in formulating a business problem and identifying the correct analytical approach to solve it.

Co-requisite(s): COR-STAT 1202 Introductory Statistics/ COR-STAT1203 Introduction to Statistics Theory/ CS105 Statistical Thinking for Data Science

Prerequisite(s): SMT111 Smart City Solution/ CS101 Prog Fundamentals I/COR-IS1704 Computational Thinking and Programming/ IS200 IS Software Foundations
Mutually Exclusive: MGMT108 Introduction to Business Analytics

19. IS425 Digital Transformation Strategy

This course addresses the business aspect of IT and students will learn how to apply IT to gain business value. We shall discuss key IT management issues faced by CIOs and Business leaders and how to become effective change agents–managing changes in the organization, processes and people. We shall also cover aspects of IS management & best practices, and apply them to solve real life case problems, as well as to propose IT strategy to address the specific business challenge given by a sponsoring organization.

Topics will vary from year to year, enabling the instructor to include a combination of the latest IT trends (e g. Mobile & Social Media) and emerging issues at the intersection of IT and management, along with some of the important fundamentals.

Students will have the opportunity to learn from leaders (CxO) in the industry on their views on specific IT management issues, best practices, and how to be successful in their career (not limited to IT career).

Note to SIS students:
IS425 revisits in more depth similar themes that were introduced in Seminar on IS Management (IS101) in your first year –such as how IT is used in the context of complex business processes; how IT can enable value generation; and other topics related to the management of information technology and systems in business settings. There will be greater emphasis on putting what you have learnt into practice by solving real life challenges holistically.

Note to non-SIS students:
Final year students are very welcome to attend this course to learn how you can best leverage IT to be more successful in your professional life. This is not a technical course and there is no coding/computing skill required. However, it is important that you have keen interest in IT and are prepared to read up on some of the topics (Reference Readings will be given) to help you gain most benefit from this course.

Prerequisite(s): Completed at least 20 CUs

20. IS458 Cloud Management and Engineering

Cloud computing gain fast development within the past 15 years and continue penetrating to many aspects of our daily lives. It provides strong and reliable support for all kinds of information systems in various industries. It also greatly reduces the go-to-market time for high-tech start-up companies. Although many people are using cloud in their daily work, but few of them have structural understanding on how cloud functions. With more and more fancy features incorporated in Cloud, it seems difficult for beginners to understand their relations and apply them to real world problems.

This course provides an introduction to the fundamental concept and basic structure of cloud computing. The topics covered include basic cloud concept, typical business and technical requirements on cloud infrastructure, basic building blocks for an cloud solution, and how to

manage reliability and incident using cloud tools. All topics are designed based on actual commercial usage pattern to support real business requirements. Computing theory and mathematical analysis are included at a minimally needed level. Exercising and integration of knowledge learnt will be covered through assignments, labs, and a demonstrative project for real world problems.

After this course, students are expected to gain a structural concept of how cloud operates and how to manipulate cloud resources to support information system and business needs. The principles and techniques learnt in this course will help students understand the common core structure of various commercial cloud platforms and how to go deeper to a specific function. With this foundation, students can easily build up their knowledge of a chosen commercial cloud on a systematic way using online resources.

Prerequisite(s): IS213 Enterprise Solution Development and IS214 Enterprise Solution Management/ CS203 Collaborative Software Development and IS112 Data Management

Mutually Exclusive: CS301 Solution Architecture

21. SMT112 Sustainable Digital Cities

This course will equip students with core knowledge of appreciating what it takes to plan, design, build and sustain digital ('smart') cities that are innovative, inclusive, safe, resilient and sustainable. By the end of this course, students will be able to appreciate the following 4 areas: Urban Challenges, Urban Sustainability, Design of 'Smart' Digital Cities and Commercialisation of selected digital city projects. There will be an introduction to how software can be used to provide solutions for smart city challenges.

Prerequisite(s): Nil

22. IS462 Virtual Reality for Business

Technology continues to transform businesses around the world in the 21st century. Digital platforms are revolutionizing the way businesses communicate with their customers and offer products and services. In recent years, there has been a rising interest in XR (extended reality – including virtual, augmented, and mixed reality) technology and applications in consumer, commercial, and industrial markets. In the coming years, advanced 5G network technology and edge computing will enable the rapid progress of XR towards mainstream adoption in many areas of our work and life. With many new developments happening in XR technology, now is the perfect time for businesses to consider incorporating XR with their enterprise solutions.The objective of this course is to cultivate a broad and comprehensive understanding of XR and prepare students for participating in the ideation, development, and integration of highly integrative and immersive applications in businesses. In particular, through the SMU-X course project, students will learn how to develop a Virtual Reality application for e-commerce businesses. The course curriculum covers a wide range of business cases (from Industrial, Manufacturing, Medical, R&D, Entertainment, Educatio, etc.), literature, and practice including: Computer Science Human-Computer Interaction (HCI) concepts, evolution of visual displays for VR, motion tracking, interactive 3D graphics, multi-modal sensory integration, user interfaces, experience design, psychology of VR, and challenges of VR as a communication and collaboration medium. This course will include lectures, readings, case discussions, guest speakers, hands-on labs, and exploration of VR platforms. The course project will require students to render e-commerce business scenarios in a VR environment.

Prerequisite(s): Nil
Mutually Exclusive: CS463 Computer Graphics and VR

23. CS427 AI Safety

With the advancement of systems like GPT, artificial intelligence (AI) techniques are anticipated to significantly impact various aspects of individuals' lives. While these AI techniques have demonstrated remarkable, occasionally superhuman, performance across numerous applications, there is a growing concern regarding their safety and security. It has been shown AI systems are subject to a range of attacks, ranging from adversarial attacks (i.e., perturbing an input slightly causes an AI to make completely wrong predictions), backdoor attacks (i.e., backdoors can be easily embedded in neural networks), and privacy-violating attacks such as membership inference attacks (i.e., an adversary may reliably infer whether a certain sample is used during training or not). In addition, AI systems can inherit or amplify biases present in their training data, potentially leading to unfair or discriminatory outcomes. Furthermore, many AI models, including GPT, are complex and not easily interpretable. It makes understanding how these models make decisions highly nontrivial, even though it is crucial for trust and accountability.

This course aims to present a systematic view on the range of AI safety problems that have been identified, analyse their root causes, and study potential approaches to mitigate the safety and security risks. In particular, we will focus on answering two key questions. First, given an AI system, how do we systematically evaluate its safety risk? Second, given an AI system that potentially has safety issues, how do we systematically mitigate the risks? This course will feature real-life AI safety issues on popular AI systems such as ImageNet, GPT and so on.

Prerequisite(s): CS101 Programming Fundamentals I/IS200 IS Software Foundations/COR-IS1704 Computational Thinking and Programming and CS420 Artificial Intelligence Fundamentals /CS521 Principles of Machine Learning/IS460 Machine Learning and Applications

24. COR-CS2232 Internet of Things Innovations for Driving Business Growth

The Internet. Of. Things. A world of smart objects. A world in which trillions of devices can sense, communicate, and collaborate over the Internet. A world where the physical and digital worlds are fused seamlessly into a networked matrix, where everything is interwoven and intertwined and interconnected in one colossal network.

In this course, we embark on an adventure; sometimes challenging, always exciting. We discover the essential elements of the Internet of Things. Sensors. Actuators. Embedded devices that unite the cyber and physical realms. The Internet of Things technologies that weave and interconnect devices together into the global tapestry of the World Wide Web.

How might we apply our newfound skills to various application domains? Through an Internet of Things prototyping project, we unleash our creative energies, our youthful idealism, and our capacity to dream, by designing, developing, and deploying an Internet of Things prototype, targeting a specific domain such as Homes, Buildings, Education, Leisure, or Social networks. This is a journey into the unknown. Yet, a still, small voice deep within us compels us: Courage! Do not be afraid! Put out into the deepest oceans and brave the stormiest seas! Let down your nets for an awesome catch!

The adventure reaches its peak at the project showcase, where we witness the work of human hands come to fruition, leaving us inspired to reflect deeply and broadly about how we, as global citizens, can harness the power of the Internet of Things as a potent force in the service of humanity.

Sounds lit? Bring some bubble tea, come and see: what's the tea with IoT? #Slayyy

Prerequisite(s): Nil
Mutually Exclusive: CS462 Internet of Things: Technology and Applications

25. IS.447 Smart Healthcare in Asia

The annual expenditure on healthcare, by both individuals and governments, is expected to continue increasing within the next five years. There is thus an imminent need to stretch the effectiveness of the expenditure, and explore new innovations, which can subsequently serve the needs of the rapidly ageing population, tackle the issues associated with shortage of healthcare professionals, and achieve improved clinical outcomes.

This course will explore the changing needs and trends of the healthcare industry, and how innovation can address the rising costs and inefficiencies in the healthcare systems, with a particular focus on Singapore and Asia. Students can expect to be equipped with knowledge of state-of-the-art smart healthcare technologies, as well as examine the multi-faceted impact of technology on this multi-million dollar industry, through various lenses.

Prerequisite(s): Nil

26. IS463 Digital Technologies for Environmental Sustainability

The efficient management of our shared resources and the way we dispose of waste and pollutants are crucial to achieving responsible consumption and production. Encouraging industries, businesses and consumers to recycle and reduce waste is necessary, as is supporting consumers to move towards a more sustainable pattern of consumption. This forms the basis of SDG12: Responsible consumption and production, which includes the following targets:

1. Substantially reducing waste generation through prevention, reduction, recycling and reuse
2. Reduce food waste along the supply chains, retail and consumer levels
3. Ensure that people have the relevant information and awareness for sustainable development.

Digital Technologies for Environmental Sustainability (in the Singapore context) is a hands on module which allows students to employ problem solving and prototyping skills using digital technologies to address the above targets. In addition to case studies of how the issue of Responsible consumption and production is tackled by various Singapore organizations, communities and businesses, they will also be exposed to design thinking, hardware and software prototyping, prototyping tools and technologes (IoT, Microcontrollers, App development, Artificial Intelligence, AR/VR, Metaverse) and will gain first hand experience in using these tools to prototype a solution to address a challenge statement around environmental sustainability.

Prerequisite(s): Nil

27. IS464 Data Analytics and Technology Guided External Course

This course is structured as a guided-by-instructor course with content provided by Google through the Google Career Certificates (hosted on online learning platform, Coursera) together with guidance and assessments by SMU. It incorporates industry or career certification in the undergraduate study to equip students with professional and technical skills.

Data Analytics and Technology Guided External Course is part of the SMU-KPMG Analytics and Cloud Technology Work Study Program in partnership with Google. Students need to clear this course and its corresponding Google Career Certificate before embarking on a six-month work-study with KPMG. There are two certificates:
1) Google Data Analytics Professional Certificate aims to give students the skillsets on collecting, transforming, organizing, and visualizing data in order to draw conclusions and drive informed decision making;
2) Google IT Automation with Python Professional Certificate focuses on equipping students to use Python in automating common system administration tasks, troubleshoot, debug complex problems, and apply automation at scale using configuration management and the Cloud.

Prerequisite(s): Nil

28. IS466 Digital Ethics for Responsible Computing

In a world where digital technologies are not just tools but extensions of our daily lives, their societal impacts are far-reaching yet still emerging. Past slogans like \"move fast and break things\" led tech companies to overlook harms, as evidenced by scandals involving user data misuse and workplace culture issues.

There is now broader recognition that responsible innovation requires understanding potential risks and aligning with human values. But how can we ensure that technology advances in a manner that's ethical, sustainable, and beneficial for all?

This timely course explores ethics in computing. Through case studies and frameworks, students will develop skills in critical and nuanced thinking about complex issues at the intersection of technology and society.

What you will find in this course:
- Embracing Complexity: We won't seek single \"right\" answers. Instead, we'll foster a space for exploring multidimensional problems with interconnected tradeoffs, encouraging students to understand, appreciate, and engage with differing viewpoints.
- Skill Development: Students will practise not just theory but systematic analysis of real-world impacts, preparing them for the consequential decisions they may face in their future careers.
- Structured Exploration: The course is divided into two engaging parts. The first introduces fundamental concepts, while the second dives into contemporary dilemmas, exposing the tensions between responsible development and disruptive innovation.
- Respectful Discourse: A commitment to respectful dialogue is central to this course. We recognise the intricate and \"messy\" nature of real-world problems, with ramifications extending far into a dynamic and uncertain technological future.
- Distinct Focus on Technology: While courses like \"COR3301 Ethics and Social Responsibility\" provide a broad understanding of ethical conduct across various professions, this course specialises in the intersection of technology and ethics. This course targets the

unique challenges of the digital age, equipping tech professionals with the nuanced understanding needed to navigate ethical dilemmas specific to computing, AI, and digital human rights. It's a tailored exploration for those aiming to align technological advancements with responsible decision-making.
- Empowering Future Leaders: By attuning students to ethical imperatives and responsible decision-making processes, this course prepares the next generation of tech professionals to navigate and guide technological progress in a manner that honours human values and serves the greater good.

Prerequisite(s): Nil

29. SMT.201 Geographic Information Systems for Urban Planning

Effective planning and management of smart cities require urban planners to integrate and share data from multiple sources to the urban users so that they can be active participants in the smart city planning process. GIS with its capability to capture, manage, display, and analyse information spatially is emerging as one of the important enabling tool in smart city planning.

This course provides students with an introduction to practical applications of GIS in smart city management and planning. Emphasis will be placed on

- locating, acquiring and integrating multi-sources of data into GIS,
- understanding the principles and methodologies of geocoding and geo referencing,
- become familiar with geovisualisation and GIS analysis techniques, and
- exploring the technologies and possibilities of GIS-enabled Planning Support Systems for smart city management.

Prerequisite(s): Nil

30. IS469 Generative AI with Large Language Models

This course on Generative AI is designed for students who want a deep yet accessible understanding of how large language models (LLMs) work and how they are applied, without requiring a mathematical background. No prior knowledge of linear algebra, calculus, or machine learning is needed. The first part of the course focuses on the foundations of LLMs—covering embeddings, transformer architectures, attention mechanisms, training and inference dynamics, and model behaviour—to give students a clear and strong conceptual grasp of the technology powering LLMs. The rest of the course covers practical applications, including retrieval-augmented generation (RAG), prompt design, and agentic workflows that enable dynamic, multi-step problem solving. With a mix of theory, hands-on labs, and projects, students will leave the course equipped to critically evaluate and effectively use and develop Gen AI-based systems in both technical and strategic contexts.

Prerequisite(s): CS101 Programming Fundamentals I/COR-IS1704 Computational Thinking and Programming/ ACCT337 Statistical Programming

31. SE201 AI-Driven Software Engineering

This course on Generative AI will provide software engineering students with a deep yet accessible understanding of how large language models (LLMs) work, their applications, and how to use them as a tool to design and deploy software efficiently. No prior knowledge of linear algebra, calculus, or machine learning is required.The first part of the course focuses on the foundations of LLMs, covering embeddings, transformer architectures, attention

mechanisms, training and inference dynamics, and model behaviour. We will discuss retrieval-augmented generation (RAG) and advanced LLM architectures, as well as the associated use cases that students are likely to encounter in practice.The second part of the course focuses on the responsible use of LLMs as a tool for software engineering. We will investigate the use of AI in eliciting user requirements, generating design documents, and code generation. As part of the DevSecOps pipeline, we will explore how AI can automate documentation tasks, code reviews, unit and integration testing, security auditing, risk assessment, and threat monitoring. Finally, we will investigate autonomous coding agents for code maintenance and optimization. Case studies, practical exercises, and an emphasis on responsible and ethical use of AI accompany these topics.Throughout the course, students will learn the practical impact of cluster and GPU architectures on the design of efficient systems. Students will explore both cloud and self-managed environments, containerization, and modern development tools and frameworks like Triton, TensorFlow, and PyTorch, along with APIs for pre-trained models from various sources.With a mix of theory, hands-on labs, and projects, students will leave the course equipped to critically evaluate and effectively use Gen AI as both a tool and a product of software engineering.

Prerequisite(s): CS101 Programming Fundamentals I/COR-IS1704 Computational Thinking and Programming
Mutually Exclusive: IS469 Generative AI with Large Language Models

32. CS467 Open Source Software Systems

Open-Source Software (OSS) forms the foundation of modern digital infrastructure, powering cloud platforms, AI frameworks, programming ecosystems, and mission-critical services. In recent years, OSS development has been transformed by the widespread adoption of Continuous AI — AI assistants and autonomous agents that contribute code, review pull requests, triage issues, assess security risks, and support maintainers. This course introduces the technical, organisational, and socio-technical foundations of OSS systems, with a strong emphasis on AI-augmented workflows. Students will study how OSS projects are architected, governed, and sustained, and how AI-driven automation shapes contribution practices, review quality, and maintainers' workload. Special focus is placed on the configuration and governance of AI agents, including GitHub PR agents, GitHub Actions workflows, CodeQL analysis bots, Claude Skills, and constitutional guidance frameworks such as spec-kit. Students will analyse real OSS repositories, propose and implement contributions, design agent configurations, and evaluate supply-chain and provenance risks. By completing the course, students will gain both practical experience and a critical understanding of the future of AI-augmented OSS development.

Prerequisite(s): CS101 Programming Fundamentals I/COR-IS1704 Computational Thinking and Programming/ ACCT337 Statistical Programming

33. IS461 AI Governance

Building deployable AI systems for high-stakes domains—healthcare, finance, public services—requires engineers to navigate institutional, regulatory, and human constraints from the start. This course teaches AI Governance as a technical discipline, focusing on the engineering, evaluation, and operational requirements that make AI systems safe, auditable, and trustable at scale.Students learn how policies and standards—such as the EU AI Act, ISO/IEC 42001, NIST AI RMF, and Singapore's Model AI Governance Framework—translate into concrete system requirements, architectural choices, testing protocols, documentation artefacts, and monitoring workflows.Grounded in real-world constraints from multilateral governance and public-sector deployments, the course covers:* Governance-as-Engineering:

Developing practical artefacts such as risk registers, model /system cards, and evaluation and monitoring plans. Infrastructure-Scale Data Governance: Architecting for secure data access, privacy-enhancing technologies (PETs), and compliance in multi-stakeholder environments—as exemplified by Digital Public Infrastructure (DPI).* Behavioural Trust Design: Engineering for “felt governance”: designing explanations, recourse pathways, and user-facing signals that shape perceived safety, fairness, and control.* Cross-Functional Translation: Bridging engineering, product, operations, legal, and compliance requirements into coherent system design.The course provides students with exposure to practical methods used in AI governance and offers opportunities to create selected governance artefacts for learning purposes. These outputs are intended to support understanding of industry practices, without implying professional qualification or job preparation.

Prerequisite(s): Nil