

## COURSE DESCRIPTIONS 科目簡介

### COURSES FOR TAUGHT POSTGRADUATE PROGRAMMES

#### **CDS501 Fundamentals of Electronic Business (from 2017-18)/ Introduction to Electronic Business (in 2016-17 or before) (3 credits)**

Electronic business is aimed at enhancing the competitiveness of an organisation by developing innovative information and communications technology throughout an organisation and beyond, through links to partners and customers. Managers and decision makers need to know not only how to use the new techniques to automate existing business processes, but also how to redesign and transform processes taking advantage of electronic business. The course introduces fundamentals and infrastructure of electronic business to familiarise students with related new technology development. It also discusses how electronic business differs from traditional business in terms of business processes and business activities, and how we can set business strategy with electronic business. How to implement electronic business in current business environment will also be discussed. The tentative topics include but are not limited to the introductory-level knowledge of Internet business models, electronic commerce infrastructure, E-procurement, E-marketing, E-CRM (Customer Relationship Management).

#### **CDS502 Supply Chain Management in eBusiness (3 credits)**

The core competence in E-business is effective transaction fulfillment. Good e-business is synonymous with powerful logistics and good supply chain relation and management. This course introduces the fundamental concepts, key issues, and problem solving tools and techniques in logistics and supply chain management. It explains how networks of firms in a supply chain must work together to enable efficient flows of information, materials, and money so that product or service reaches customers at the right time and quantity to maximise customer value. It also examines how different e-business models are matched by different logistics and supply chain structures and solutions.

#### **CDS503 Accounting and Financial Technology (from 2017-18)/ Accounting Principles (in 2016-17 or before) (3 credits)**

Accounting is frequently called as the language of business. This course will train the student to master how accounting records and reports economic activities for the use of creditors, shareholders, government agents and other stakeholders. The students will learn the conceptual framework of accounting, and the operational aspects of financial reporting. In addition to the use of accounting information for the external users, the course will also provide students to concepts and techniques to prepared accounting reports for internal users, such as manager and directors for internal management decision. The course will provide students with the concepts and methods of organising and analysing accounting information to facilitate management decision makings, such as, planning, control and problem solving. The course may provide understandings of accounting information system and how it is designed. The students may be introduced to the assurance of the integrity of accounting information. Latest trend in the development of accounting information system may also be highlighted. Examples and references to eBusiness and Supply Chain Management may be used if suitable.

Financial Technology is one of the hottest topics in recent years, it is also one of the business areas that can easily attract investments. This course will discuss the basic concepts of financial technology, the business landscape, the tools and applications

**CDS504 Business Data Analytics (from 2018-19)/ Business Intelligence (in 2017-18 or before) (3 credits)**

This course is designed to introduce data analytics and its applications in e-Business. Databases are valuable treasures containing data and hidden precious knowledge. Conventionally, the data are analysed manually to explore the relationships among various variables. Even with powerful computers and software, analysts may not be able to recognise some hidden and potentially useful relationships. Nowadays, such problems are more acute as many organisations are performing their operations electronically and these organisations are capable of generating and collecting a huge amount of data in a relatively short period. The explosive growth of data requires a more efficient way to extract useful knowledge. Data analytics, which is an automated process of sifting the data to get the gold buried in databases, can fulfill this requirement.

E-Business is the conduct of business processes (e.g., buying and selling products and services, providing customer services, solidifying customer loyalty, identifying leads, processing payments, cooperating with business partners, etc.) on the Internet. E-Business organisations need huge information and knowledge from all data sources to give one holistic view of business partners, customers, products, services, and processes. This allows managers to make informed decisions to achieve effective cooperation among partners, customer acquisition and retention, cross selling, up selling, customer lifetime value maximisation, appropriate marketing strategies, products and services optimisation, innovations, and business process reengineering. The rapid accumulation of various kinds of data has prompted managers to use data analytics to extract knowledge for decision making.

**CDS505 Mobile Technology and Applications in eBusiness (3 credits)**

This course introduces the foundation of mobile technology and the basics for developing mobile applications. The course is also designed for managers to appreciate the business value of innovations in mobile technology as well as the relevant ethical issues.

**CDS506 Best Practices in eBusiness and Supply Chain Management (3 credits)**

This capstone course integrates various aspects of eBusiness and supply chain management, and applies the theories, concepts, and methods covered in relevant courses. Through the use of mini-lectures, case studies, and group projects, students will study current practices in various industries and identify strategies and approaches that give an organisation a competitive advantage.

**CDS507 Legal Issues for eBusiness (3 credits)**

This course does not presume any legal knowledge on the part of the students. Students will be taught the salient features of the Hong Kong legal system, with particular emphasis on the sources of Hong Kong law, law courts and the two branches of the legal profession. Students will then be introduced to certain legal issues in eBusiness, including the definition of eBusiness and an explanation of how writing and signature requirements are fulfilled in the eBusiness environment. This is followed by a discussion on electronic contracts with regard to how the three essential requirements of a paper-based contract are satisfied in the Internet environment and the factors that affect the validity of a valid contract. Contract for the sale of goods will also be covered. Finally, certain other important issues with regard to eBusiness, such as consumer protection and domain name disputes will also be examined.

**CDS508 Electronic Marketing (3 credits)**

Electronic marketing has become the fastest-growing form of marketing. It continues to be

increasingly driven by artificial intelligence, big-data and cloud computing, and is claiming a surging share of marketing spending and sales. Nowadays, total digital marketing spending including online display, search advertising, video, social media, mobile, e-mail, and other tools, becomes the largest share of media spending, surpassing television. For many companies today, electronic marketing is more than just supplementary channels or advertising media. It constitutes an integrated and even a complete model for doing business. Some firms such as Charles Schwab, Tencent and Amazon employ this direct and digital model as their entire approach to the marketplace.

Also, digital tools empower customers and put customers in favourable positions by enabling them to acquire abundant information, compare products and bargain better purchases. Successful marketers are not reactive to such business challenge. They proactively leverage on digital technology and interactions to lead customers on their digital journeys.

**CDS509 E-Commerce Implementation: Planning, Platform Selection, and Execution** (from 2018-19)/ **E-Commerce and Web Programming** (in 2017-18 or before) **(3 credits)**

This course is designed to introduce students about e-Commerce implementation in planning, e-Commerce platform selection, and hands-on execution of the chosen e-Commerce software. Particularly, various approaches and software platforms in e-Commerce development as well as the associated technologies will be introduced. The state-of-the-art and easy-to-use e-Commerce platform in the marketplace will be used in the course to implement fully functioning e-Commerce stores. The essential steps involved in designing, developing, administering, analysing, and promoting the constructed e-Commerce stores will also be explored. Besides, students will have exposure to the various supporting technologies such as databases, HTML, and CSS to customise the business rules and control transactional processing to improve the e-Commerce stores.

**CDS510 Social Media for eBusiness (3 credits)**

This course is about the fundamentals of social media for eBusiness and the steps involved in incorporating social technology into an eBusiness platform. It equips students with a comprehensive understanding of social media applications and their contribution to the formulation and corporate strategies.

**CDS511 Project Management with Software (3 credits)**

The principles of project management, largely developed and tested on engineering projects, are being successfully applied to projects of all sizes and types within the business world. Furthermore, the role of project management in a cross section of applications such as information technology, product development, and construction is now emphasised. This course addresses the fundamental principles of project management, and the tools and techniques at our disposal to help achieve our goals. Topics covered include: project definition and start up; project attribute estimation; planning and scheduling; resource selection and allocation, implementation; post-project evaluation; project management as a career; skills and knowledge required by professionals, including decision-making and resource allocation appropriate to project phases; integration with other disciplines, including accounting and finance. The Microsoft Project software tool will be introduced for project scheduling and management.

**CDS512 Service Operations Management (3 credits)**

The service sector represents the largest component in most industrial economies.

Operations management plays an important role in effectively improving the service organisations' performance and competitiveness, and its importance is increasing due to global competition and rapidly evolving information technology. This course provides an overview of service operations management. We will introduce the basic concepts, principles, and techniques that are applied to the design, planning, control, and improvement of service operations. After an introduction to service and service operations, the following topics will be explored: service strategy, new service development (including the design of service process), service process analysis and facility layout, service quality management and control, process improvement, managing capacity and demand, and managing waiting lines. We will also apply the principles and techniques discussed in the course to the analysis of cases from various service industries.

### **CDS513 Purchasing and Logistics Management for eBusiness (3 credits)**

This course explores the principles and practices of purchasing and logistics in the eBusiness context. It examines the potentials of strategic purchasing to increase profitability through quality-driven approaches to sourcing, buyer-supplier relationships, and cost and logistics management, with a focus on the use of information technology for efficient purchasing and logistics management. This course provides general and specific purchasing and logistics management information that will serve to strengthen the student's ability to participate in today's global business environment.

### **CDS514 Information Systems Management (3 credits)**

This is a managerial course designed for students to gain an understanding of the effective use of information technologies in organisations nowadays. It covers not only the latest generation of computing, internetworking, and decision support technologies, but also the current industry trends, management concepts, and approaches, business applications, social, ethical, and governance issues related to information systems.

### **CDS515 Business Decision Making with Software (3 credits)**

Organisations often need to make decisions in their best interests in different situations, and Microsoft Excel is one of the most popular software that business people use to assist their decision making.

This course introduces commonly used quantitative analysis techniques that facilitate scientific and systematic decision making. Students will learn how to employ appropriate decision-making techniques to obtain the best solutions for a variety of business problems, and learn about the best-practices of spreadsheet modeling for clarity and communication. Through practicing these techniques and Excel functions, students will develop analytical and computer-based problem-solving skills, which can help them improve their performance at work or in daily life.

### **CDS521 Foundation of Artificial Intelligence (3 credits)**

Artificial intelligence (AI) is a new technical science that studies and develops theories, methods, techniques, and application systems for simulating and extending human intelligence. AI techniques and models have been widely employed in various domain-specific applications due to their promising performance compared to conventional methods. This course focuses on fundamental concepts, techniques, and potential business applications of artificial intelligence. The course provides an overview of waves of AI, intelligent agents, problem-solving, planning, reasoning, learning. It includes topics about search, logic, genetic algorithms, computational learning methods, and some potential business applications like expert systems, news analysis, and so on.

### **CDS522 Business Data Management (3 credits)**

This course is designed to describe the advanced concepts and principles of data management for business. Various types of databases will be discussed in this course, such as objected-oriented, relational, document-oriented, NoSQL, and New SQL. Popular database management systems such as Microsoft SQL Server and/or Oracle will be described. Topics include data models (ER, relational, and others); query language (Structure Queries Language); management of semi-structured and complex data; NoSQL databases. It also covers the essential concepts, options, and best practices for data administration, data protection, privacy control, user security and management, and system configurations. It addresses topics about the general concepts of data disaster recovery, planning, and procedures.

### **CDS523 Principle of Data Analytics and Programming (3 credits)**

This course provides students with the knowledge of the business data analytics process as well as the fundamental principles of programming for data collection, data preprocessing, data analysis, and data visualisation. It introduces different concepts of Python programming, including the basic Python language syntax, variable declaration, basic operators, program flow and control, defining and using functions, classes, and file and operating system interface. Basic Python packages designed for data analytics will be introduced, such as Numpy, Scipy, Matplotlib, and Pandas. A number of data analytics applications in different business domains will be described.

### **CDS524 Machine Learning for Business (3 credits)**

Machine learning is a branch and one of the most popular AI techniques in recent years. Machine learning models and techniques have been widely used in many fields, such as natural language understanding, machine vision, and pattern recognition. This course will introduce the concepts, techniques, and business applications of machine learning. The course will cover the supervised, semi-supervised, unsupervised, transfer, and reinforcement learning paradigms. The techniques include regression, probability generative model, logistic regression, neural networks, support vector machine, Q-learning, and so on. The business application examples of these courses will be included and introduced in this course.

### **CDS525 Practical Application of Deep Learning (3 credits)**

Deep learning is one of the bleeding-edge technologies of machine learning. It is a neural network used to establish and simulate the human brain for analytical learning and to interpret data by imitating the mechanism of the human brain. Deep learning is widely used in computer vision, speech recognition, natural language processing, and other fields. This course aims at providing an intensive understanding and hands-on experience of the existing deep learning approaches. The topics will cover how to select deep neural networks, how to design deep neural networks, and how to train and optimise the neural networks for practical applications. The course will cover deep neural network models, including convolutional neural networks, recurrent neural networks, long short-term memory networks, deep residual networks, generative adversarial networks, attention-based models, adversarial learning models, and training techniques including dropout, batch normalisation, selection of activation functions and so on. TensorFlow, Pytorch, or other state-of-the-art deep learning tools will be introduced and applied to solve different classes of problems with huge datasets in business domains.

### **CDS526 Artificial Intelligence Based Optimisation (3 credits)**

In an optimisation problem, one seeks to minimise or maximise an objective function or a number of objective functions with real, integer, and/or discrete variables, subject to

constraints on the variables. Optimisation refers to the study of these problems, their properties, the development and implementation of algorithms to solve these problems, and the application of these algorithms to real-world problems. In this course, advanced artificial intelligence algorithms such as multi/many objectives optimisation algorithms, genetic algorithms, evolution strategies, ant colony optimisation, particle swarm algorithms, firefly algorithms, differential evolution, and other meta-heuristic methods will be discussed. These methods are able to find optimal or near-optimal solutions for challenging optimisation problems. This course will also describe some real-world applications that use these algorithms to handle difficult business problems.

### **CDS527 Big Data Analytics (3 credits)**

This course provides an understanding of the concept and challenge of big data. The focus is on the data analytic techniques to tackle the V's (volume, velocity, variety, veracity, valence, and value) in big data and how these impacts data collection, monitoring, storage, analysis and reporting. The following topics across the big data domain will be introduced: distributed file systems; big data analysis techniques; high-performance processing algorithms for big data; big data search and query technologies. An example (Apache Spark) of big data management system to manage and process large-scale data is introduced in the course. Big data analytics applications in business will also be elaborated. Students will actively participate in the delivery of this course through assignments, portfolio development, and projects.

### **CDS528 Blockchain (3 credits)**

Blockchain, as a decentralised open ledger, has proven to be a phenomenal success. This ground-breaking technique holds a huge promise in various fields, digital identification, data marketing, cryptocurrencies like bitcoin, etc. This course introduces students the fundamentals of blockchain, distributed ledger technology, alternative consensus, smart contracts and security, and cryptocurrencies. Case studies of cryptocurrencies and examples of application (e.g., Bitcoin) will be also elaborated. Students will understand the impact of blockchain technologies on financial services and other industries through assignments and projects.

### **CDS529 Project for Artificial Intelligence and Business Analytics (3 credits)**

The integrated use of AI techniques and business analytics for solving the real-world problems is a critical ability. This course aims to provide an opportunity for students to integrate their knowledge obtained in other courses that involves the preparation, analysis, reflection and dissemination of data in a chosen research or application setting. The emphasis is on the management and execution of a well-defined project of a suitable scale. The projects may involve either real-world or experimental data and students may engage in such projects in groups. Some example of the projects will be “Convolutionary Neural Networks for Object Detection in Supply Chain Management”, “Financial News Analysis for Stock Market Prediction”, “User perceptions and Opinion Mining from Social Media Data”, “Personalised Recommendations from E-Commerce based on Matrix Factorisation” and so on.

### **CDS530 Healthcare Analytics (3 credits)**

Healthcare analytics transform the traditional medical system in an all-round way, making healthcare more efficient, more convenient, and more personalised. This course will introduce student the key technologies that support smart healthcare. It explains how to build the surveillance infrastructure and how the data is collected and transmitted back from various wearable sensors of multiple sources, by using the technologies of Internet of Things (IoT): Medium Access Control (MAC) protocols, routing protocols. This course

will also describe data fusion of health and healthcare data, data models, data management, machine learning algorithms, and analytics techniques and tools for health risk prediction. Case studies and examples of application will be elaborated in this course.

### **CDS531 Marketing Analytics and Intelligence (3 credits)**

Marketing analytics is the intersection of Marketing and Data Science, generating business insights and offering new opportunities for a competitive advantage. New digital technologies have fundamentally changed various aspects of marketing practice over the past years and have led to a dramatic shift in the quantity and quality of information we are able to access, analyse, and act. The course discusses the cutting-edge techniques used to unlock the predictive potential of data analysis to enhance marketing performance, strategic management, and operational efficiency and provides students with hand-on experience in the application of analytical tools and techniques, to real-life marketing problem.

### **CDS532 Programming for Data Science (3 credits)**

The aim of this course is to introduce students to the fundamentals of Python, a general-purpose programming language widely used in the application of Data Science, Big Data Analytics and Optimization to business problems. The course will provide students the skills for implementing your own algorithms as well as using the thousands of Python packages available for data analysis like modelling and decision support. The lab classes will provide opportunity for students to practice their programming skills and obtain formative feedback. The course is focused on practical knowledge, examples and real-world applications for data analytics. The course is very much hands-on with the ultimate goal of turning students into a versatile data analyst for real-world applications.

### **CDS533 Statistics for Data Science (3 credits)**

This course provides a comprehensive overview of statistical concepts, models, and data analysis techniques essential for data science applications. Students will gain practical skills in exploratory data analysis, statistical modeling, machine learning algorithms, and communicating analytical insights. Programming in R or Python will be emphasized to implement methods. Through case studies and hands-on projects with real data, students will learn how to apply statistical thinking and programming skills to extract meaningful information, make data-driven predictions and decisions, and effectively communicate results to stakeholders.

### **CDS534 Database Management (3 credits)**

This course is designed to describe the advanced concepts and principles of data management for business. Various types of databases will be discussed in this course, such as objected-oriented, relational, document-oriented, NoSQL, and New SQL. Popular database management systems such as Microsoft SQL Server and/or Oracle will be described. Topics include data models (ER, relational, and others); query language (Structure Queries Language); management of semi- structured and complex data; NoSQL databases. It also covers the essential concepts, options, and best practices for data administration, data protection, privacy control, user security and management, and system configurations. It addresses topics about the general concepts of data disaster recovery, planning, and procedures.

### **CDS535 Data Mining (3 credits)**

This course teaches the core principles and ideas of data mining. It covers a range of data mining approaches used to extract knowledge from vast amounts of valuable databases in diverse fields such as business, finance, urban planning, and medicine. Data mining

techniques such as classification, clustering, association rules will be covered. In addition, advance topics such as sequential data mining, graph mining and social network analysis will also be covered. Furthermore, students will develop quantitative analytical skills to interpret data mining models. By the end of the course, students will have a comprehensive understanding of the theory and practice of data mining and will be equipped with the necessary skills to extract valuable insights from databases.

### **CDS536 Data Science Project (3 credits)**

This course provides students the chance to demonstrate innovative abilities and initiatives in data science problems. Students will be required to carry out independent work on a major project, which can be theoretical or practical, under the supervision of individual staff member. The course develops the capability to integrate and apply data science knowledge and data analytical skills to different scenarios. The course also serves as a platform of presenting and sharing novel investigations of academic and/or industrial problems in real-world via data science knowledge.

### **CDS537 Introduction to Cyber Security (3 credits)**

This course introduces fundamental concepts and design principles in cybersecurity as well as highlight different methodologies of protecting information and data in the cyber world. Topics include CIA (Confidentiality, Integrity, and Availability); introduction to security; cyber-attacks and threats; cryptographic algorithms and applications; network security and infrastructure.

### **CDS538 Cloud Computing (3 credits)**

With the rapid development of cloud resources, majority of traditional data centers has been replaced by cloud platforms (such as Amazon Web Services, Microsoft Azure, Google Cloud Platform) due to the limited bandwidth of resource. A qualified data scientist needs to equip with cloud computing skills, learning to perform a series of tasks in the data pipeline on the cloud such as data acquisition, data cleansing, data transformation and data mining, as well as model training and testing. This course aims to examine the latest trends of cloud computing and provide students with the fundamental knowledge of cloud computing. Students will learn the best practices in deploying and implementing cloud computing applicable for unique business requirements. The course discusses the conceptual topics of cloud technologies and provide hands-on experience through projects utilizing public cloud infrastructures. Topics include cloud delivery models (SaaS, PaaS, and IaaS); Cloud computing overview; Public cloud infrastructure, On-demand self-service, and resource pooling; rapid elasticity; measured service; cloud storage architecture (data distribution, durability, consistency, and redundancy); data deduplication; cloud security issues; case studies of current cloud computing platforms.

### **CDS539 Natural Language Processing (3 credits)**

This course is an introduction to Natural Language Processing (NLP). It covers a brief overview of the field, including the cutting-edge text processing tasks (e.g., text summarization, named entity recognition, document classification, etc.), their computational problem setting and general thoughts of methodologies. State-of-the-art techniques will also be discussed, including generative sequence-to-sequence models, multimodal data modelling (e.g., image-to-text, video/audio-to-text), chatbot, question-answering system, topic modelling, etc.

### **CDS540 Computer Vision (3 credits)**

This course will introduce the techniques for visual data processing and analysis. Topics include image processing and analysis in spatial and frequency domains, image restoration



and compression, image segmentation and registration, morphological image processing, representation and description, feature description, face recognition, iris recognition, fingerprint recognition, image analysis topics, such as medical image analysis.

### **CDS541 Operations Management (3 credits)**

This course introduces operations management in real-world situations (e.g., manufacturing and service industries). Students will learn how to design, operate, and improve processes to increase efficiency and effectiveness. The course covers key topics such as process design, capacity planning, inventory management, quality control, and supply chain management. Students will learn the importance of operations management, as well as the various techniques and strategies used to optimize processes and improve organizational performance.

### **CDS542 Data Visualization (3 credits)**

This course introduces the fundamental visualization techniques to transform complex data sets into understandable and insightful visual representations for the purpose of data storytelling. The curriculum spans across a range of topics, including the design principles, human visual perception, open source visualization tools, visualization techniques for CT/MRI data, computational fluid dynamics, graphs and networks, time-series data, text and documents, Twitter data, and spatio-temporal data. The course adopts a hands-on approach, incorporating practical exercises using popular data visualization tools like Tableau, PowerBI, and D3.js. It also emphasizes the importance of data preparation and cleaning, ensuring students understand the entire data visualization process from data collection to final visualization.

Throughout the course, students will be tasked with creating their own data visualizations, culminating in a group project where they will present a data story using the skills learned.

### **CDS543 Social Computing (3 credits)**

This course examines the intersection of social behavior and computing technology. Students will learn techniques for collecting, analyzing, and visualizing social data through areas like network analysis, data mining, and information visualization. The course covers computational tools to study social structures, dynamics, communities, and information diffusion at scale. Students will consider ethical issues in social data as they apply these techniques through programming assignments and a social network project. The course also explores user-centered design of social platforms and applications. Students will critically examine popular social systems while gaining practical experience building social interfaces and applications.

### **CDS544 Mobile Edge Computing (3 credits)**

Mobile Edge Computing (MEC) is an emerging technology that extends cloud capabilities to the network edge. This course will introduce students to the key concepts, architectures and enabling technologies of MEC. Students will learn about the motivation for MEC and challenges it addresses in mobile cloud computing. Fundamentals of MEC frameworks and deployment models will be covered. Enabling 5G networking and edge infrastructure technologies facilitating MEC will be examined. Applications such as IoT, augmented reality and smart cities will also be explored. Techniques for offloading tasks, computation partitioning and managing resources at the edge will be studied. Topics including edge artificial intelligence and data processing frameworks will be discussed. Security, privacy preservation and open source/industry edge platforms will be topics of focus. Students will gain an understanding of MEC frameworks for developing low latency applications. Through this practical course, students will learn the foundations of the impactful new Mobile Edge Computing field.