BEng (Data Science & Engineering)

THE UNIVERSITY OF HONG KONG

DEPARTMENT OF COMPUTER SCIENCE

Data Science & Engineering

Data science and data engineering has evolved as a new discipline and profession

Not simply for data analysis, but a new paradigm for problem solving (=> new products)

Go beyond traditional CS, statistics, engineering courses (e.g. visualization, privacy, legal)

Problem-solving in all sorts of data-intensive application domains

E.g., banking, healthcare, media and entertainment, weather forecasting, transportation, marketing, and supply chain management

High demand and high impact

Job roles: data engineers (develops, constructs, tests and maintains architectures, e.g., data models, databases and large-scale processing systems), data scientists (clean, organize, analyze & interpret big data)

Shortage of professional data analysts worldwide, also for HK and GBA, e.g., shortage of 250,000 data scientists by 2024 in US

The BEng(Data Science & Engineering) programme

- A multidisciplinary programme offered by Department of Computer Science, with support from the Department of Statistics and Actuarial Science, Department of Mathematics, and Faculty of Law
- To equip students with the fundamental knowledge and practical skills in data science and engineering plus a focus on a data-intensive domain, thus creating an additional competitive edge for our graduates in the job market
- To provide a solid foundation for students pursuing career and research in the data science discipline

Programme Highlights

Comprehensive Foundations
Computer Science, Statistics, Engineering, Law

Advanced Studies

- Data mining
- Machine learning & Artificial intelligence
- Big data systems
- Advanced statistics
- Visual analytics & visualization
- Cyber security
- Data-driven technologies & applications

Capstone Experience

- Data science in practice
- Domain-specific application project / Technology project

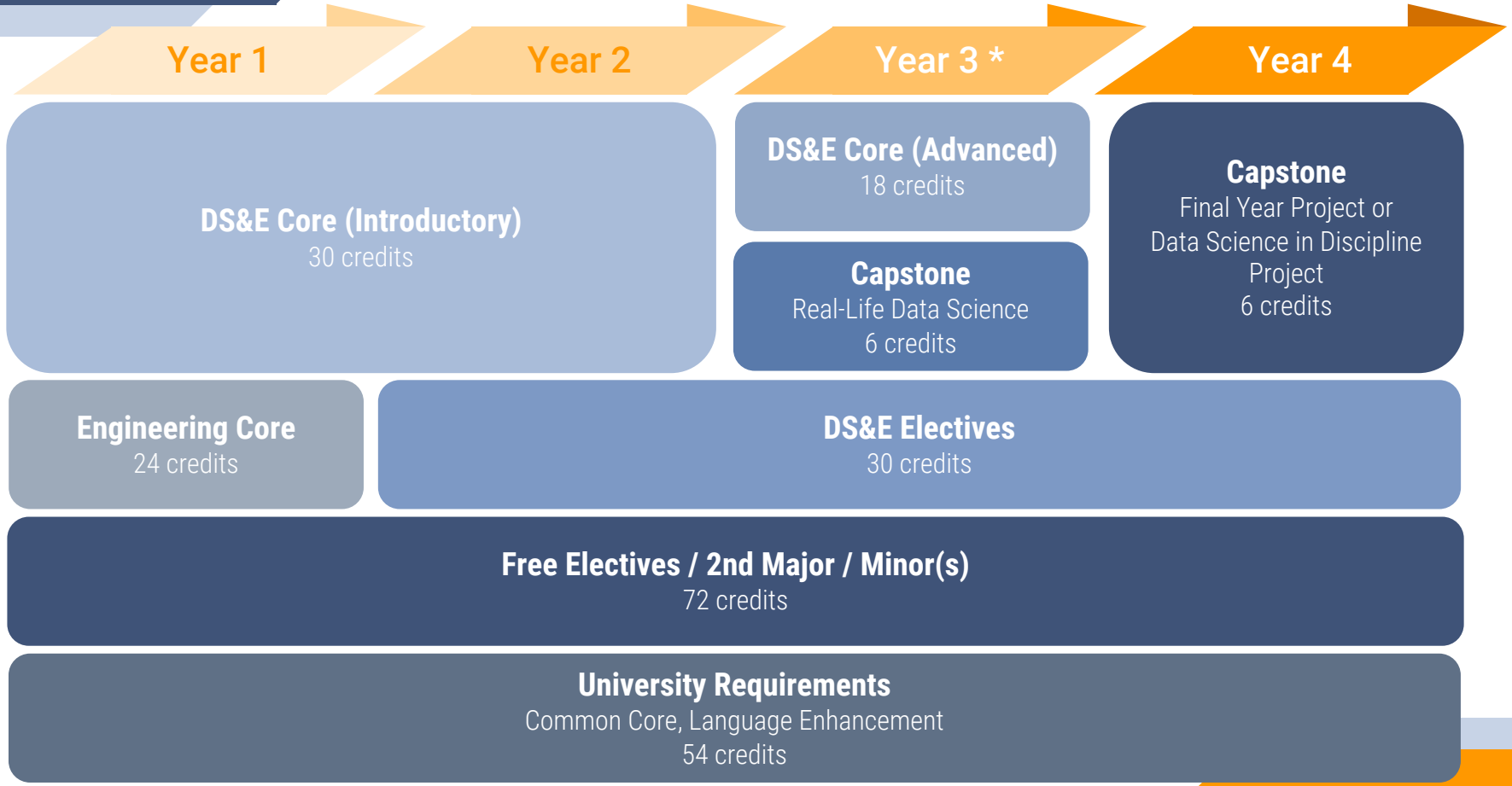
DS&E Application Domain

An option to pursue a minor in a specific domain for the application of data science and engineering;
e.g., business, engineering, science, social science, architecture, urban planning and education

Programme Learning Outcomes

Upon successful completion of the curriculum, students should be able to:	
PLO(a)	apply knowledge of data science and engineering technologies to data science applications appropriate to the programme outcomes and to the discipline
PLO(b)	apply knowledge of data science and engineering technologies to the abstraction and conceptualization of data science applications
PLO(c)	analyze a data-centric problem, and identify and define the data science and engineering methodologies and technologies appropriate to its solution
PLO(d)	design, implement, and evaluate a data science solution, process, component, or programme to meet desired needs with appropriate consideration for public health and safety, social and environmental considerations
PLO(e)	function effectively on teams to accomplish a common goal
PLO(f)	demonstrate an understanding of professional, ethical, legal, security and social issues and responsibilities
PLO(g)	communicate effectively with a range of audiences
PLO(h)	analyze the local and global impact of data science technology on individuals, organizations, and society
PLO(i)	recognize the need for and an ability to engage in continuing professional development
PLO(j)	use current techniques, skills, and tools necessary for data science and engineering practice with an understanding of the limitations

Curriculum Map



** Internship during summer*

Courses

University Requirements (54 credits)
Core University English (6 credits)
English in the Discipline (6 credits)
Chinese language (6 credits)
Common Core courses (36 credits)
Non-credit bearing courses

DS&E Core (Introductory) (30 credits)
Introduction to Data Science and Engineering
Introduction to Data Structure and Algorithms
Multivariable Calculus and Linear Algebra
Probability and Statistics I
Probability and Statistics II

Engineering Core (24 credits)
Engineers in the Modern World
Computer Programming I
Computer Programming II
University Mathematics II

DS&E Core (Advanced) (18 credits)
Introduction to Database Management Systems
Machine Learning
Law and Ethics in Data Science

DS&E Electives (30 credits)
Artificial Intelligence, Applied Deep Learning, Cyber Security, Natural Language Processing, Visualization for Data Analytics, Big Data Systems, Data Analytics for IoT, Big Data and Data Mining, Statistical Machine Learning, Multivariate Data Analysis, etc.

Capstone (12 credits)
Real-Life Data Science
Final Year Project or Data Science in Discipline Project
Internship

Information

Regulations and Syllabus for the degree of BEng(Data Science & Engineering)

- https://engg.hku.hk/Teaching-Learning/BEng-BASc/Academic-Programmes/Regulations-Syllabuses

BEng(Data Science & Engineering) web site

- https://www.cs.hku.hk/datasce

First Year Experience Website

- https://www.fye.hku.hk/

Further Enquiries

BEng(Data Science & Engineering) programme

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