Applied Learning

2022-24 Cohort; 2024 HKDSE

Item	Description
1. Course Title	Tech Basics
2. Course Provider	School of Continuing Education, Hong Kong Baptist University
3. Area of Studies/ Course Cluster	Engineering and Production/Information Engineering
4. Medium of Instruction	Chinese or English
5. Learning Outcomes	Upon completion of the course, students should be able to: (1) write simple computer programmes and applications by using a range of modern programming languages and software; (2) describe the latest emerging technologies in the information technology industry; (3) explain the basic concepts and functions of information technology; (4) describe technical and business knowledge in computer science, focusing on data analytics, cybersecurity and artificial intelligence; (5) demonstrate communication, collaboration and interpersonal skills in the technology field; and (6) develop self-understanding for further studies and career development in the related field.

6. Curriculum Map – Organisation and Structure

Module 1
Fundamentals of Information Technology (IT)
(30 hours)

- Introduction to Emerging Technology (Data Analytics, Cybersecurity and Artificial Intelligence)
- Computer Hardware Components and Architectures
- Concepts of Software and Applications
- Computer Ethics and Social Issues
- Basic IT Security and Threats

Module 2
Programming (39 hours)

- Data Structures and Basic Algorithm Design
- Introduction of Programming Languages (Python)
- Introduction to Data Science Programming

Module 3
Database (24 hours)

- Data Processing with Spreadsheet Software (Excel)
- Data Processing with Relational Database Management System (RDBMS)

Module 4
IT Project Management Skills
(24 hours)

- Project Management
- Collaboration
- Leadership
- Effective Communication

Module 5
Application Development
(39 hours)

- Object Oriented Programming (JavaScript)
- Fundamentals of Web Development using "HTML5"
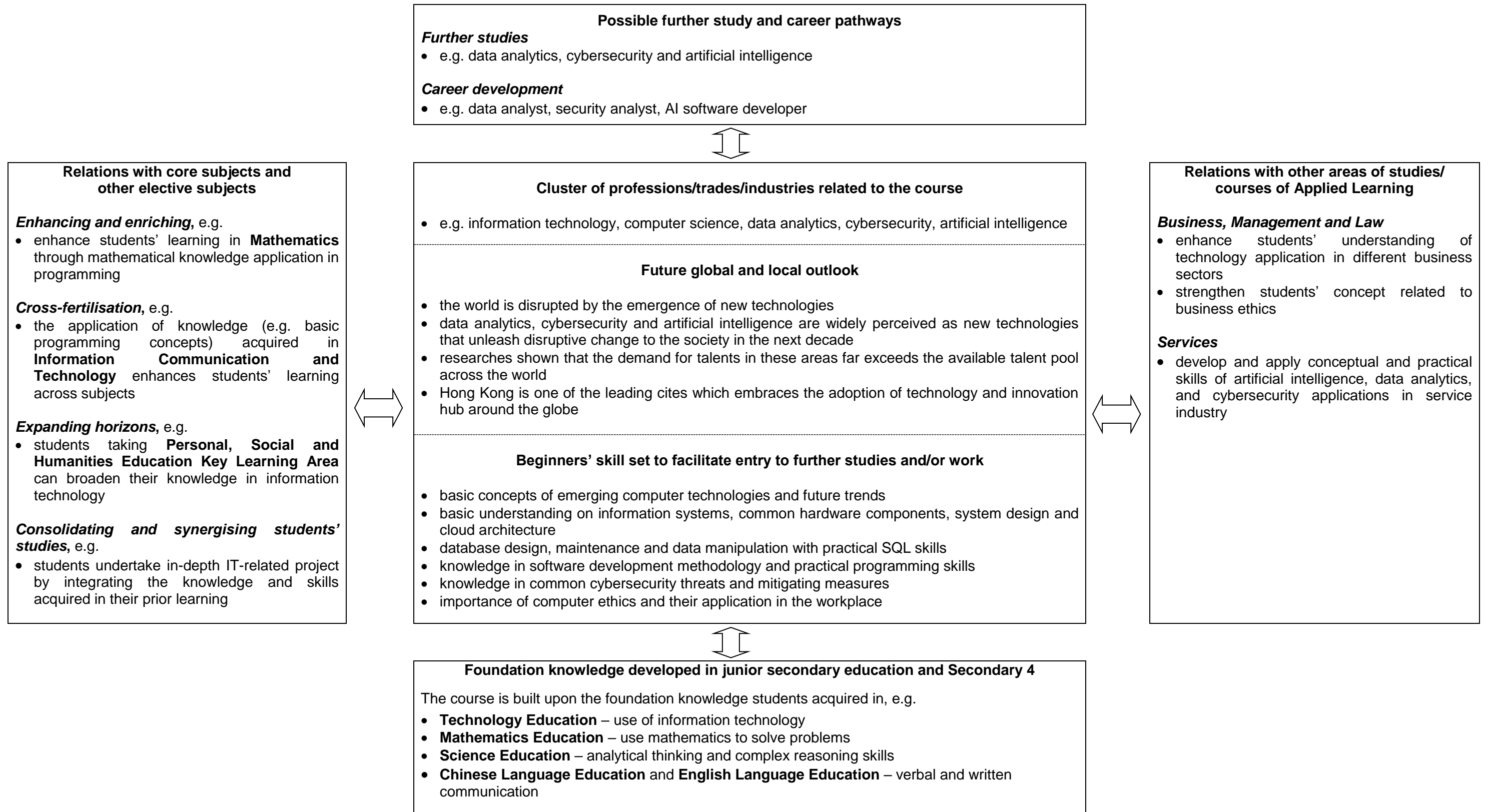- Fundamentals of Mobile App Development using "Swift"

Module 6
Data Communications and Networking
(24 hours)

- Network Fundamentals
- Switching and Routing Technology
- Infrastructure Services, Security and Management

7. The Context

- The information on possible study and career pathways is provided to enhance students' understanding of the wider context of the specific Applied Learning course. Students who have successfully completed Applied Learning courses have to meet other entry requirements as specified by the institutions.
- The recognition of Applied Learning courses for admission to further studies and career opportunities is at the discretion of relevant institutions. The Education Bureau and the course providers of Applied Learning are exploring and seeking recognition related to further education and career development opportunities for students successfully completing the Applied Learning courses.

Possible further study and career pathways

Further studies
- e.g. data analytics, cybersecurity and artificial intelligence

Career development
- e.g. data analyst, security analyst, AI software developer

Relations with core subjects and other elective subjects

Enhancing and enriching, e.g.
- enhance students' learning in **Mathematics** through mathematical knowledge application in programming

Cross-fertilisation, e.g.
- the application of knowledge (e.g. basic programming concepts) acquired in **Information Communication and Technology** enhances students' learning across subjects

Expanding horizons, e.g.
- students taking **Personal, Social and Humanities Education Key Learning Area** can broaden their knowledge in information technology

Consolidating and synergising students' studies, e.g.
- students undertake in-depth IT-related project by integrating the knowledge and skills acquired in their prior learning

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Cluster of professions/trades/industries related to the course

- e.g. information technology, computer science, data analytics, cybersecurity, artificial intelligence

Future global and local outlook

- the world is disrupted by the emergence of new technologies
- data analytics, cybersecurity and artificial intelligence are widely perceived as new technologies that unleash disruptive change to the society in the next decade
- researches shown that the demand for talents in these areas far exceeds the available talent pool across the world
- Hong Kong is one of the leading cites which embraces the adoption of technology and innovation hub around the globe

Beginners' skill set to facilitate entry to further studies and/or work

- basic concepts of emerging computer technologies and future trends
- basic understanding on information systems, common hardware components, system design and cloud architecture
- database design, maintenance and data manipulation with practical SQL skills
- knowledge in software development methodology and practical programming skills
- knowledge in common cybersecurity threats and mitigating measures
- importance of computer ethics and their application in the workplace

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Relations with other areas of studies/ courses of Applied Learning

Business, Management and Law
- enhance students' understanding of technology application in different business sectors
- strengthen students' concept related to business ethics

Services
- develop and apply conceptual and practical skills of artificial intelligence, data analytics, and cybersecurity applications in service industry

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Foundation knowledge developed in junior secondary education and Secondary 4

The course is built upon the foundation knowledge students acquired in, e.g.
- **Technology Education** – use of information technology
- **Mathematics Education** – use mathematics to solve problems
- **Science Education** – analytical thinking and complex reasoning skills
- **Chinese Language Education** and **English Language Education** – verbal and written communication

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Learning and Teaching

Course Title : **Tech Basics**
Area of Studies : **Engineering and Production**
Course Provider : **School of Continuing Education, Hong Kong Baptist University**

In Tech Basics, student-centred learning and teaching activities are designed to enable students to understand fundamental theories and concepts, develop their generic skills, and address their career aspirations in information technology industry.

Different modes of activities are employed to provide students with a systematic understanding about the context (e.g. lectures on emerging technology and basic programming applications) and eye-opening opportunities to experience the complexity of the context (e.g. company visits and mentorship).

Students acquire an understanding of the requirements, fundamental knowledge and skills essential for further learning within the area through learning-by-practising opportunities in an authentic or near-authentic environment (e.g. practical learning sessions using industrial standard software).

Students are also encouraged to develop and apply conceptual, practical and reflective skills to demonstrate entrepreneurship and innovation (e.g. in web development and mobile application project, students develop a new or alternative method to solve a real-life problem or develop a prototype from a creative idea). Students are given opportunities to integrate the knowledge and skills acquired and consolidate their learning (e.g. conduct an integrated project that involves understanding a core problem and suggesting solution related to artificial intelligence, data analytics or cybersecurity).

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Curriculum Pillars of Applied Learning in Context – Tech Basics

Upon completion of the course, students should be able to:
- write simple computer programmes and applications by using a range of modern programming languages and software;
- describe the latest emerging technologies in the information technology industry;
- explain the basic concepts and functions of information technology;
- describe technical and business knowledge in computer science, focusing on data analytics, cybersecurity and artificial intelligence;
- demonstrate communication, collaboration and interpersonal skills in the technology field; and
- develop self-understanding for further studies and career development in the related field.

Through the specific contexts related to the course, students have different learning opportunities, for example:

1. **Career-related Competencies**
   - design and construct simple algorithms with modern programming languages involving basic data types, data structures and control structures;
   - perform simple data manipulation and database operation using SQL;
   - operate UNIX-based computer systems;
   - perform system design and analysis based on basic knowledge of cloud technology, service and architecture;
   - understand the software development cycle and methodologies (e.g. Waterfall model, Agile model);
   - gain insights on the emerging technologies and how they will revolutionise society, with focuses on artificial intelligence (AI), data analytics and cybersecurity;
   - enhance understanding of industry requirements through practical exercises which are set according to the industry standard; and
   - understand the future trend of information technology through visits, and sharing and lectures by industry practitioners.

2. **Foundation Skills**
   - communicate concisely and effectively in both verbal and written forms in role play, case discussion, project presentation, written reports and interview simulations; and
   - apply information technology skills in searching information online, case analysis and presentation.

3. **Thinking Skills**
   - demonstrate the ability to simplify a complex problem by dividing it into smaller components using the design thinking process;
   - develop analytical and critical thinking skills through project-based assignment which simulates real working environment;
   - create lists of possible categories, alternatives, or constituent parts; and
   - apply analytical skills in the social and ethical issues for technology field.

4. **People Skills**
   - collaborate with team members to establish clear and tangible goals;
   - demonstrate the ability to motivate, inspire, and lead in a team;
   - present with confidence;
   - give and receive feedback appropriately; and
   - delegate and share responsibility.

5. **Values and Attitudes**
   - demonstrate an openness to new and contrary ideas;
   - develop autonomy and take ownership of student's own learning;
   - assume accountability/responsibility for mistakes and collaborate with team members to resolve them;
   - demonstrate awareness of how actions affect the team, the organisation, and the wider community; and
   - appreciate and respect the uniqueness of others.