Curriculum Renewal on Senior Secondary

Information and Communication Technology

Briefing on SS ICT Curriculum

Time	Topic
3:30 - 4:00 p.m.	Rationale behind the ICT Curriculum review and proposed changes on Elective Options
4:00 - 4:10 p.m.	Views from HKEAA (Mr Jonathan NG)
4:10 - 4:20 p.m.	Views from Tertiary Institute (Dr CHUI, HKU)
4:20 - 4:30 p.m.	Views from IT Sector (Dr CHEUNG, HK Computer Society / STEM Education Alliance)
4:30 - 5:00 p.m.	Q & A

Background

Date		Milestone
2017	JUN - DEC	• Set up working group to review the compulsory part of ICT curriculum (10 meetings)
2018	JAN - MAY	• Proposed curriculum renewal on Compulsory Part of SS ICT curriculum endorsed by ICT One Committee and HKDSE ICT Subject Committee
	JUN	• Survey to all schools on proposed changes on Compulsory Part of SS ICT curriculum
	MAY - AUG	• Conduct FGIs with Tertiary Institutes and IT industry
	NOV	• Joint meeting of CDC-HKEAA Committee on ICT and HKDSE ICT Subject Committee to discuss the summary of findings, review the curriculum of the Compulsory Part and propose the updated framework of the Elective Part of the SS ICT Curriculum
2019	JAN-APR	• Work group meetings to review the learning content of the Elective Part
	JUN	• Joint meeting of CDC-HKEAA Committee on ICT and HKDSE ICT Subject Committee to finalise the curriculum the Compulsory Part and Elective Part of the SS ICT Curriculum

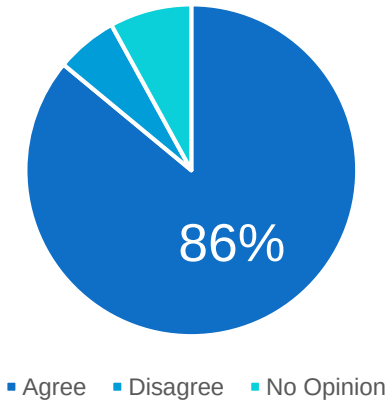
Rationale (Compulsory Part)

- The world-wide trend of learning programming, "a new language to be used for communication in the 21st Century" such as 30% of ICT curriculum time to teach programming in junior secondary (2016) and the promotion of Coding Education for primary in HK (2017), SS ICT students should be able to write computer programs
- Remove outdated contents and include up-to-date contents
- 422 replies from the school ICT curriculum survey (71%)
- Survey findings on Compulsory Parts
  - Over 80% replies agreed on the proposed changes on Part A to Part E
  - However, there was no clear direction on reviewing the elective options

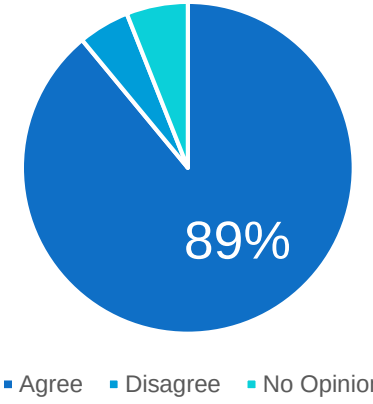
Compulsory Part (Structure)

A. Information Processing	37
B. Computer System Fundamentals	20
C. Internet and its Applications	31
D. Computational Thinking and Programming	48
E. Social Implications	8
No. of hours allocated	144

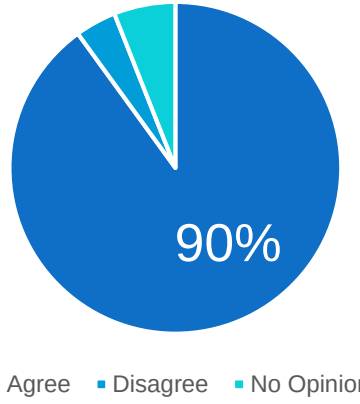
1. Do you agree with the proposed changes for the Compulsory Part of Information and Communication Technology curriculum?



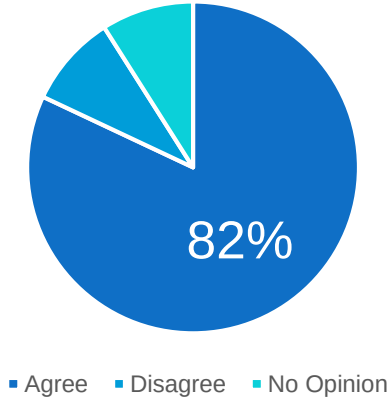
(A) Information Processing



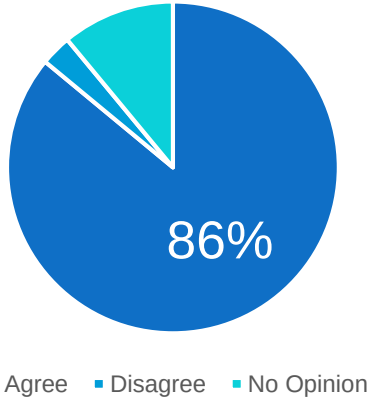
(B) Computer System Fundamentals



(C) Internet and its Applications

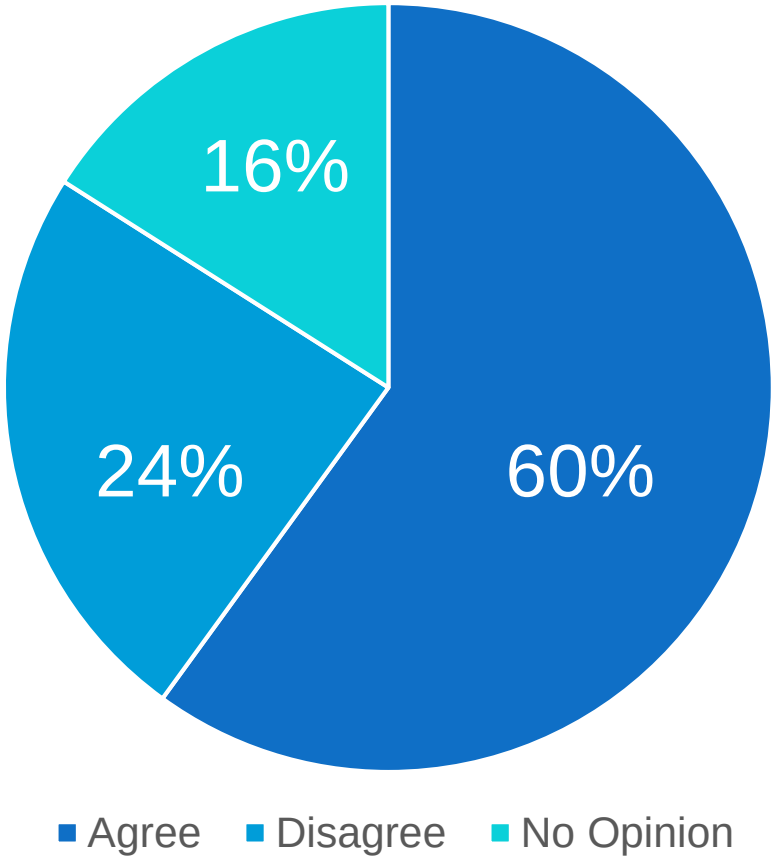


(D) Basic Programming Concepts



(E) Social Implications

2. Do you agree that the programming languages C++, Pascal and Python will be used in parallel in the 2024 HKDSE examination for the Compulsory Part and the elective option "Software Development"?



Interface

Senior Secondary
HKDSE ICT
2022 S4 First Year on Updated Curriculum

S6 2024/25
S5 2023/24
S4 2022/23

Junior Secondary
ICT Knowledge Context under TEKLA Curriculum (2016)
30% lesson time on Programming/Coding

S3 2021/22
S2 2020/21
S1 2019/20

Upper Primary
Computational thinking – Coding Education: Supplement to the Primary Curriculum (2017)

P6 2018/19
P5 2017/18
P4 2016/17

Rationale (Elective Part)

① Focus group interviews with ICT professional bodies (HKACE, AiTLE), IT Sectors (HKCS, STEM Alliance) and Academic Institutions (HKU, CityU, BU)

② From Depth to Breadth – Cover broad discipline of ICT instead of drilling on specific area, so as to build up all-round capacity for further studies and apply ICT in different perspectives

③ Focus on ICT-related content and practical elements – Increase the hand-on experiences for students to apply the learning content

Updates on Elective Part

- Trimming half of existing content, such as difficult content or too theoretical, in order to allow students to take two electives instead of one
- Proposed DSE arrangement
  - One set of paper containing all electives instead of four so that students can choose questions from any two options
  - Encourage students to study all options so as to maximize their choices on questions

Elective Part (Structure)

Choose two among three options.

A. Databases	38
B. Web Application Development	38
C. Algorithm and Programming	38
No. of hours allocated	76

Elective Part (Content) Option A (Databases)

a. ~~Introduction to Databases~~

b. Relational Databases

c. Introduction to Database Design Methodology

d. ~~Database Applications, Development and Society~~

Elective Part (Content) Option C (Algorithm and Programming)

a. Programming

b. ~~Programming Languages~~

c. ~~Systems Development~~

d. Applications of Programming in Real Life

Applications of Programming in Real Life (6 hours)

Learning Outcomes	Remarks
Use extended programming modules or libraries in writing programs to interact with physical devices.	Students should be able to use extended modules or libraries for capturing data from sensors (e.g. light sensor and accelerometer) and controlling specific devices (e.g. motor). Details of extended modules or libraries are not required.
Use event handlers in writing event-driven programs.	Specific events include user actions (e.g. pressing a button) and sensor values (e.g. the reading from the light sensor is over a defined value). Details of event handlers are not required.
Construct simple programs on physical devices by using features/components of physical devices like speech recognition and accelerometer.	Examples include generating a text display by speech recognition, controlling the movement of motors and detecting motion by accelerometer.

Elective Part (Content)

- Option B (Web Application Development) are mainly extracted from Option B (Data Communications and Networking) and C (Multimedia Production and Web Site Development) in the existing SS ICT curriculum

Elective Part (Content) Option B (Web Application Development)

- Remove the content related to Multimedia
- Maintain the content on networking at the level on setting ad-hoc/home wifi/wired network
- Implementation on coding/programming in web application development

Elective Part (Content) Option B (Web Application Development)

- Network Services and Implementation (14)
  - Basic concepts client-server communication
  - Basic network implementation
- Web Programming and Applications (24)
  - Web authoring and publishing
  - Web programming and applications

Network Services and Implementation (14 hours)

(i) Basic concepts client-server communication

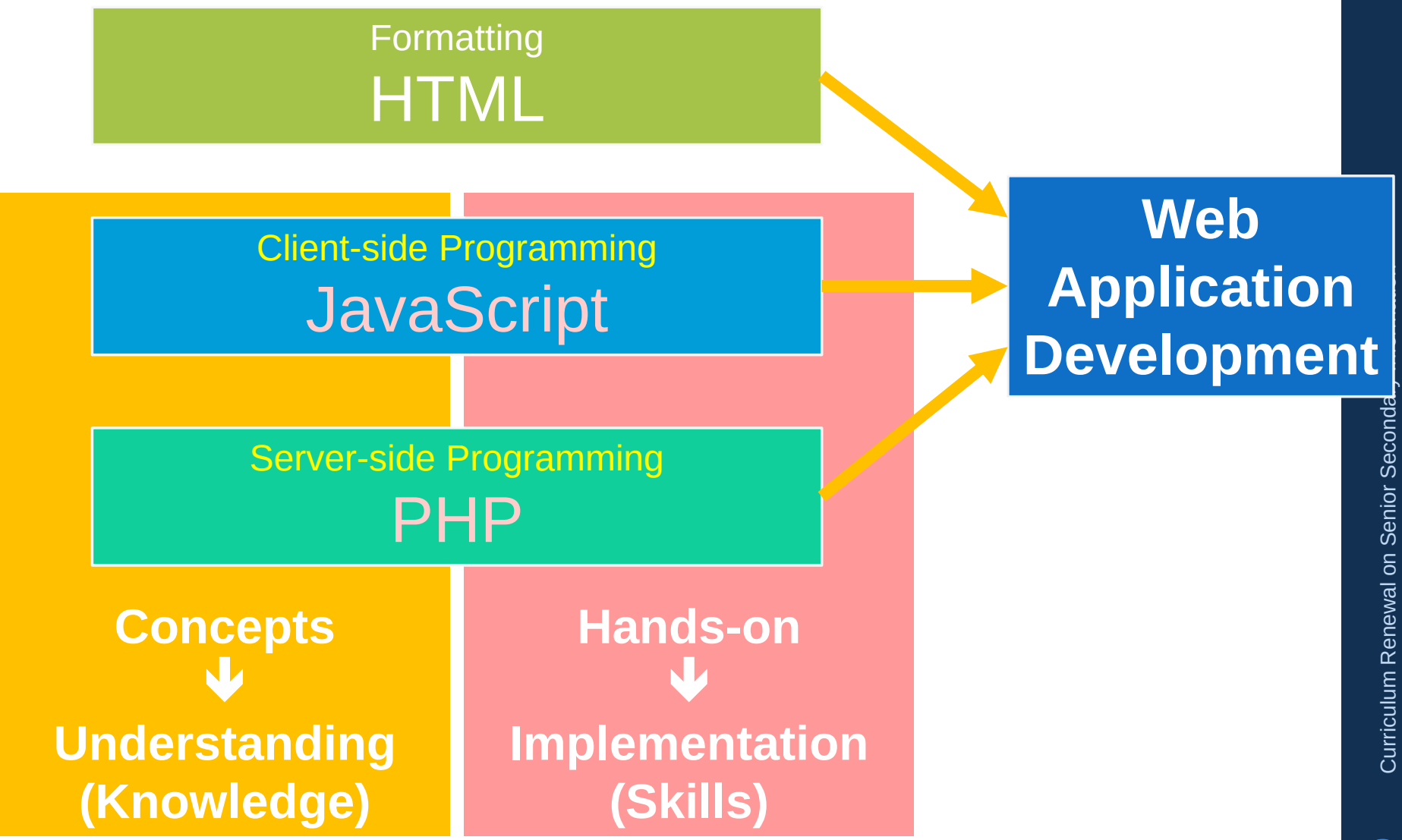
Learning Outcomes	Remarks
Know the basic concepts of client-server communication.	This includes the concepts of request and response, including port number in TCP, GET and POST request in HTTP.
Know the roles of client and server as two network programs in a network.	
Describe common network services.	The common network servers include the Dynamic Host Configuration Protocol (DHCP) server, domain controller, file server, proxy server, web server and database server, gateway, etc.

Network Services and Implementation (14 hours)

(ii) Basic network implementation

Learning Outcomes	Remarks
Set up simple Ethernet and wireless networks.	Examples of simple networks include home networks and ad hoc networks in small exhibitions and special events.
Share various resources among the networked computers/stations.	The resources include files, printers and Internet connection, etc.
Set folder/ file-sharing permissions, including read, write and execute rights, etc.	
Set up simple network services.	Examples of network services include web service and database service.

Web Programming and Applications (24 hours)



Web Programming and Applications (24 hours)

(i) Web authoring and publishing

Learning Outcomes	Remarks
Edit web pages.	Students should be able to edit HTML code of web pages and apply a consistent look and style across a set of web pages through Cascading Style Sheets (CSS).
Publish content on web.	Students should know different ways for publishing content on the web. For example, building a website and posting content through a web-based content management system.

Web Programming and Applications (24 hours)

(ii) Web programming and applications

Learning Outcomes	Remarks
Understand the difference between server-side and client-side technologies.	
Create client interface.	Students should be able to create client interface in form of web page and application.
Construct simple client-side and server-side scripts.	Examples: • Process input data from clients (e.g. calculation on quadratic equation) • Simple data validation (e.g. check the range of numeric input) • Retrieve and update data from a single-table database • Use of Cookies for storing of user Information

Web Programming and Applications (24 hours)

(ii) Web programming and applications

Learning Outcomes	Remarks
Develop a simple web application.	Students should be able to integrate client-side and server-side scripts to develop the application. Examples: • Search engine on restaurants in a shopping mall • Homework checklist for a class • Personal weight management system
Be aware of the new trends in web application development.	

The Compulsory Part (144 hours)			
A. Information Processing	(37 hours)	B. Computer System Fundamentals	(20 hours)
C. Internet and its Applications	(31 hours)	D. Computational Thinking and Programming	(48 hours)
E. Social Implications	(8 hours)		

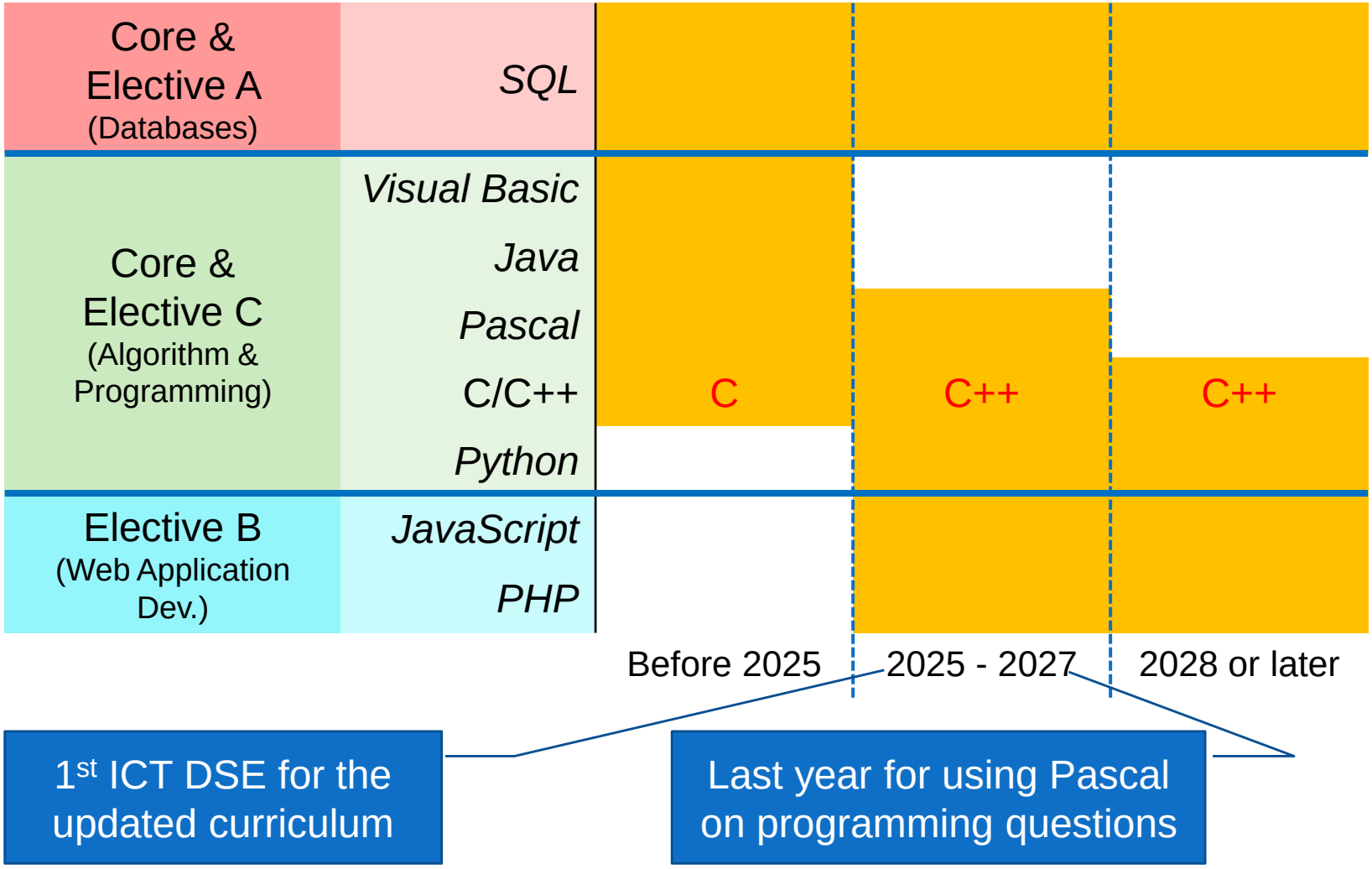
+

The Elective Part (76 hours) (Choose any two)		
A. *Databases*	B. *Web Application Development*	C. *Algorithm and Programming*

Examination Arrangement

Component		Weighting	Duration
Public examination	Paper 1: Compulsory Part	55%	2 hours
	Paper 2: Elective Part • **One set of paper instead of four** • **Choose questions from any two options** 2A Databases elective 2B Web Application Development elective 2C Algorithm and Programming elective	25%	1½ hours
School-based Assessment (SBA)		20%	

Programming Languages



Proposed schedule of implementation of revised SS ICT curriculum

Date		Milestone
2019	DEC	• Briefing to all schools on proposed changes on Elective options of SS ICT curriculum with an on-site survey
	DEC	• Joint meeting of CDC-HKEAA Committee on ICT and HKDSE ICT Subject Committee to discuss the summary of findings in the briefing and endorse the revised ICT curriculum
2020	JAN	• Meeting of CDCC(TE) to discuss and endorse the revised ICT curriculum
	FEB	• Meeting of CDC and PEB to discuss and endorse the revised ICT curriculum
	MAR	• Announcement of the revised ICT curriculum • 18 months for publishers to write textbook(s)
2022	SEP	• The revised ICT curriculum implements in S4 and DSE in 2025