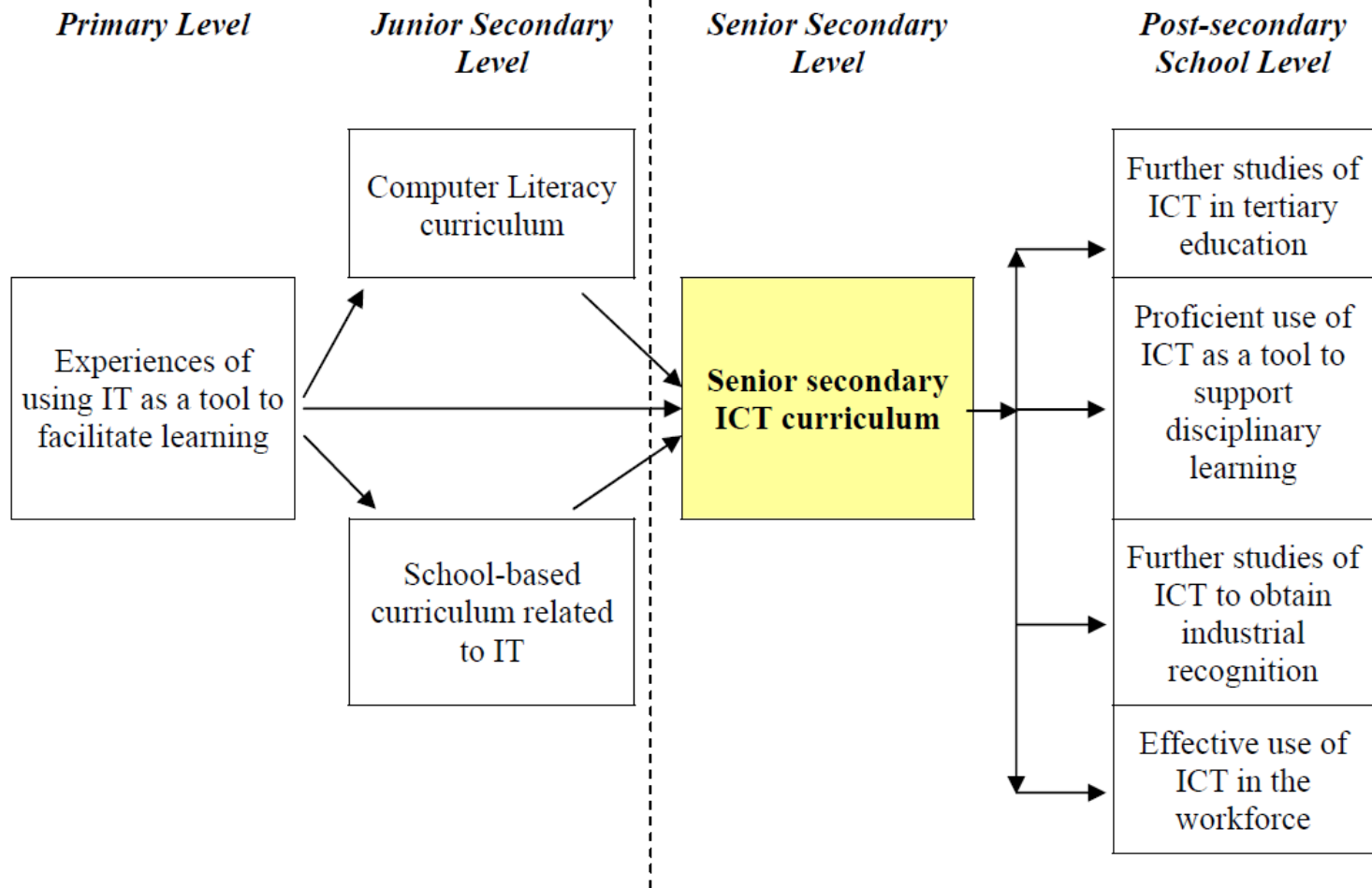


The Compulsory Part of the NSS ICT Curriculum

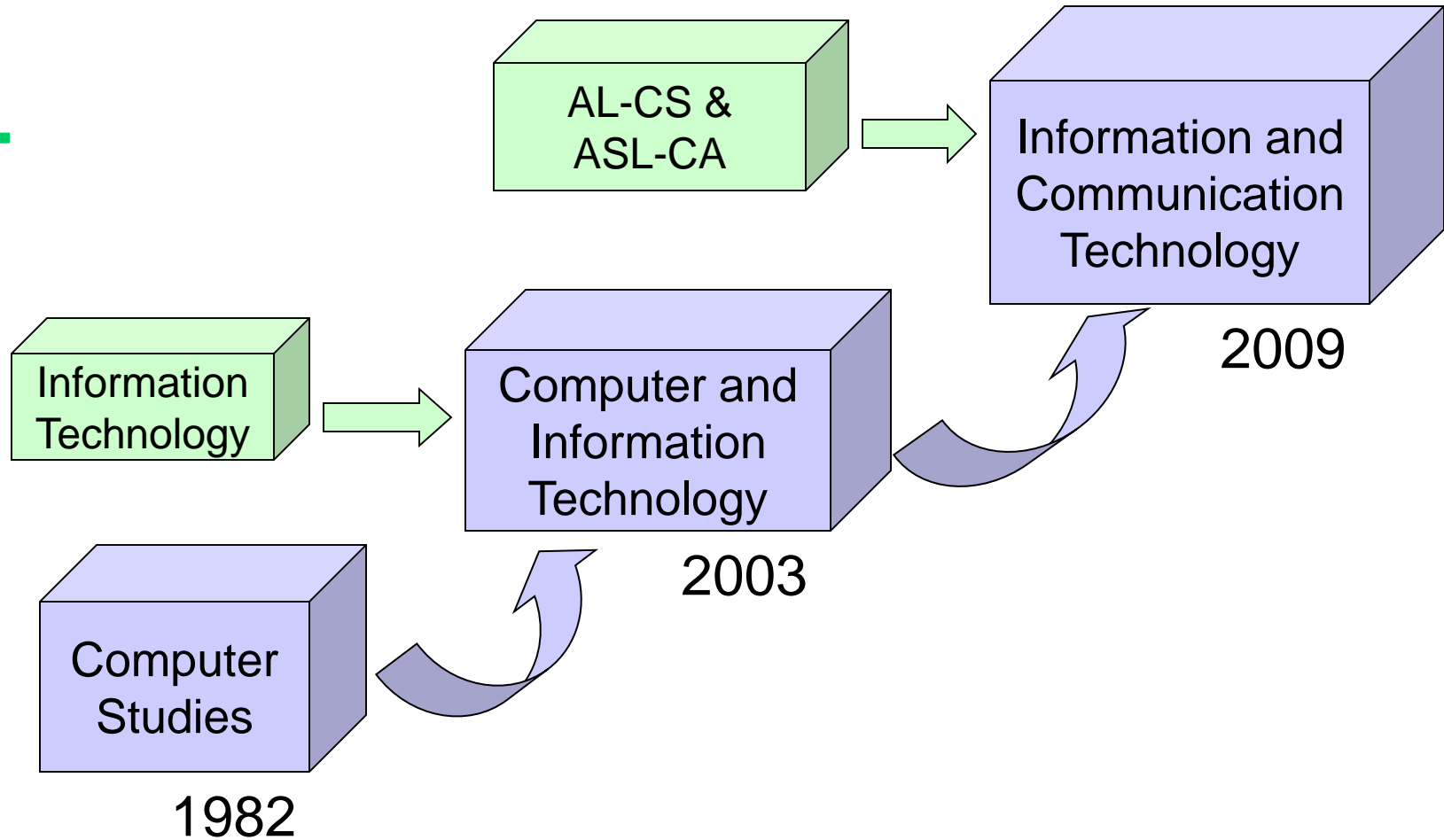
The title is centered and overlaid on a background of five circles. Two circles are solid light purple, and three are light purple with a thin white outline. The circles are arranged in two rows: three in the top row and two in the bottom row.

Mr. NG Hok-ling
Chairman of CDC – HKEAA Committee on ICT (Senior Secondary)

Interface with different Key Stages



From CS to ICT



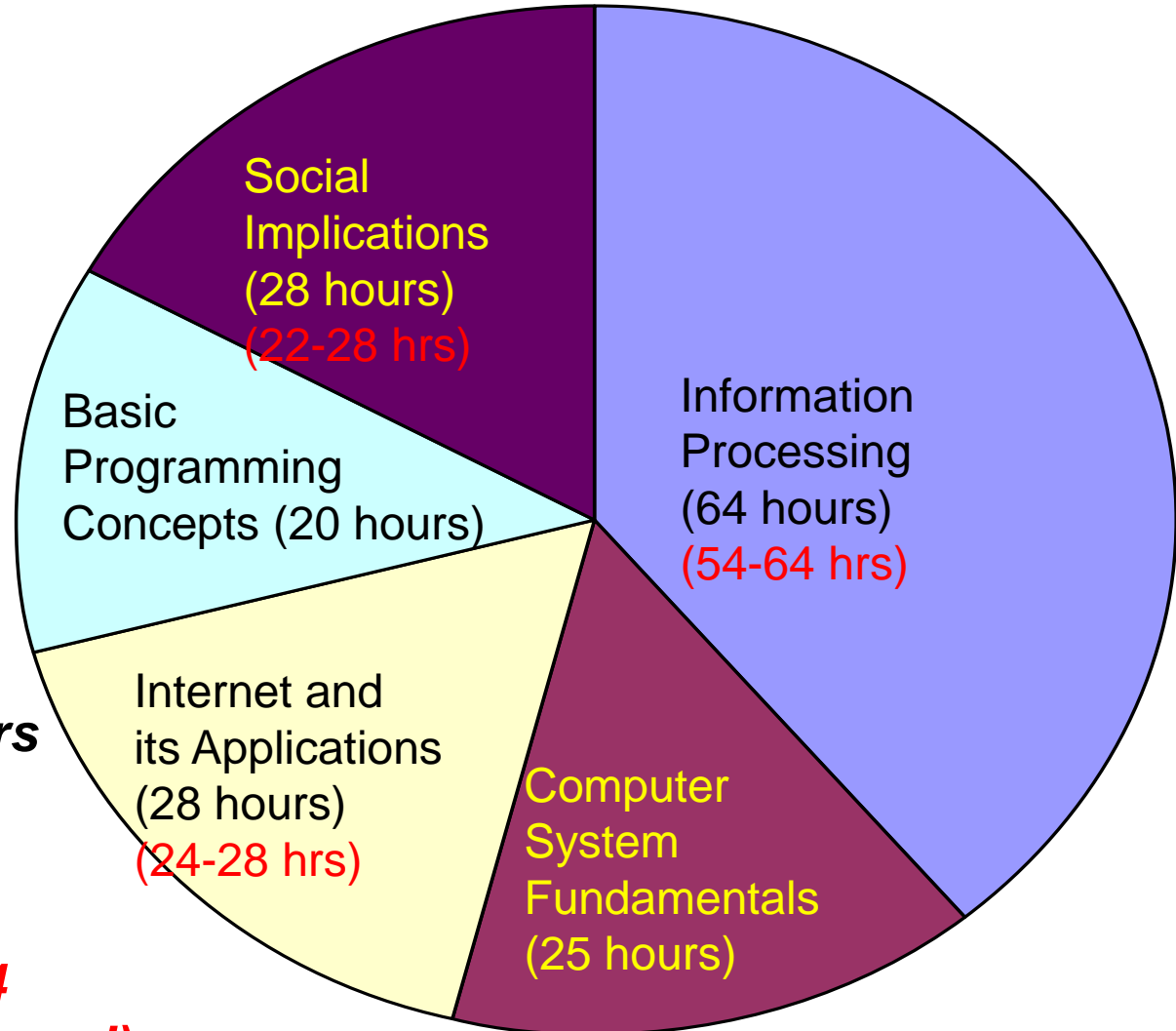
What are in this part?

Fundamental Topics on ICT which

- can withstand time and the rapid development of technologies.
(eg. algorithm in Basic Programming Concepts)
- can provide students a solid foundation and broad study of ICT.
- incorporate and revise topics from the previous ASCA (*Office and Internet Applications*), ALCS (*Computer Organization*) and CIT (*Basic Programming Concepts and Social Implications*) curricula.

Time allocation: 165 hrs

(145-165 hrs for S4 form Sept 2013 onward)



For reference:

Elective Part: 75 hrs

SBA: 30 hrs

Total: 270 hrs

**(250-270 hrs for S4
from Sept 2013 onward)**

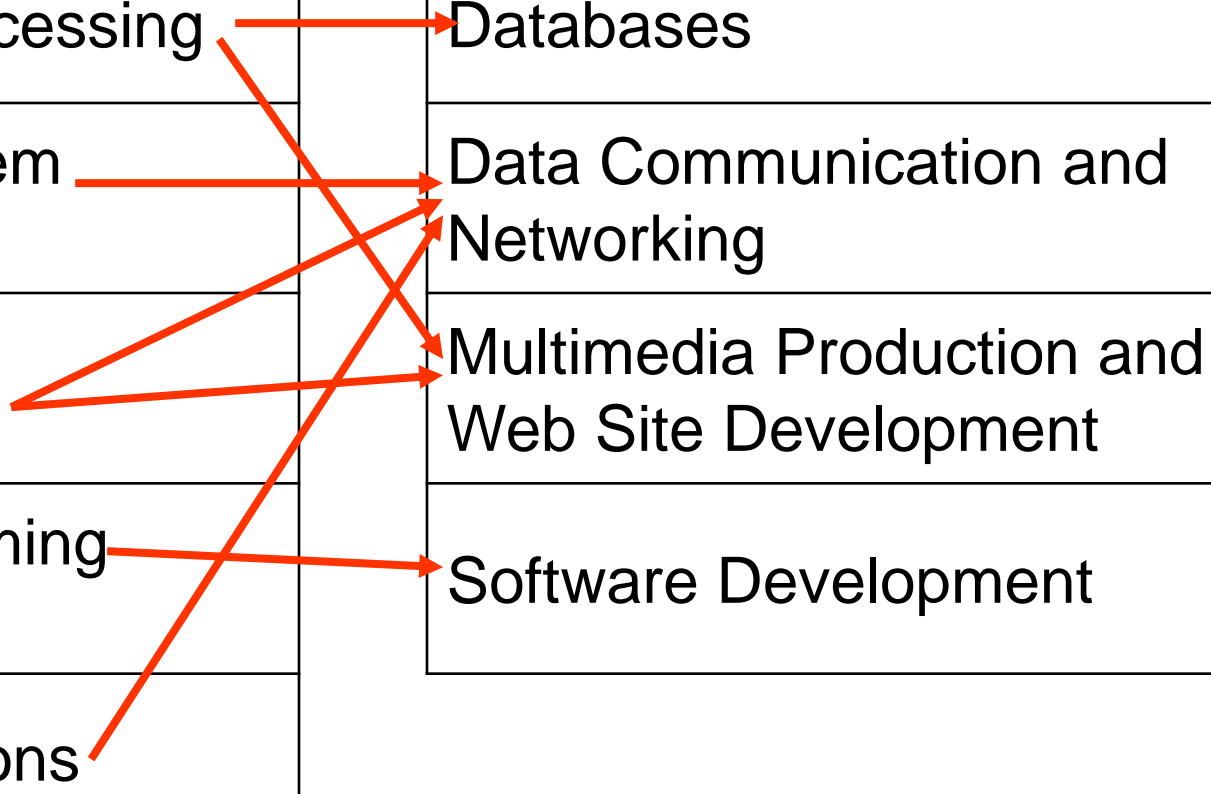
From Compulsory to Electives

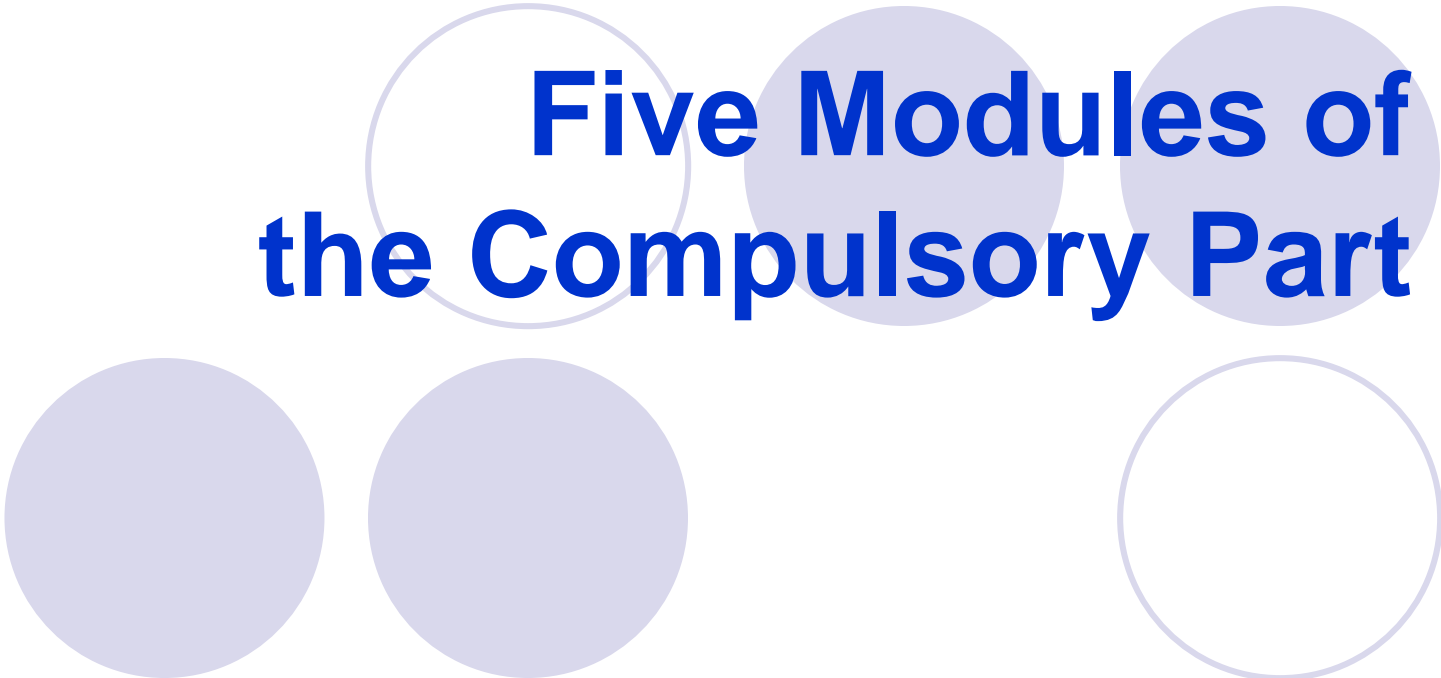
Compulsory Modules

| |
|-------------------------------|
| Information Processing |
| Computer System Fundamentals |
| Internet and Its Applications |
| Basic Programming Concepts |
| Social Implications |

Related Electives

| |
|--|
| Databases |
| Data Communication and Networking |
| Multimedia Production and Web Site Development |
| Software Development |



The slide features five decorative circles. Three are solid light purple and two are white with light purple outlines. They are arranged in two rows: the top row has three circles and the bottom row has two circles. The text is centered over the top row of circles.

Five Modules of the Compulsory Part

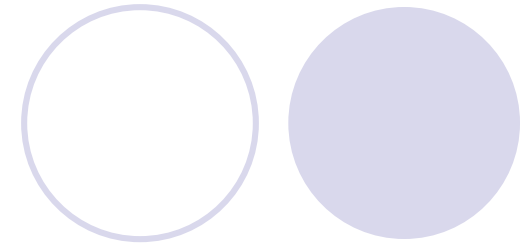
A. Information Processing Learning Objectives

Students will learn about:

- information systems and processes in real-life contexts;
- the difference between information and data;
- how data are organised and represented inside a computer;
- the integrated use of office automation software, and the appropriate processing and presentation of different types of information; and
- how advances in ICT foster the development of the Information Age and its impact on society.

A. Information Processing

Topics



| | hrs |
|---|-----|
| a. Introduction to Information Processing | 5 |
| b. Data Organisation and Data Control | 4 |
| c. Data Representation | 10 |
| d. The Use of Office Automation Software | 40 |
| e. Presentation of Information | 5 |

Total: 64

A. Information Processing

a. Introduction to Information Processing

| Topic | Learning Outcomes | Remarks |
|---|---|---|
| a. Introduction to Information Processing (5 hours) | <ul style="list-style-type: none"> Describe the basic concepts of the Input-Process-Output cycle and the use of a stored program in a processing system. Identify and examine the components of an information system. Distinguish between various information processes. Realise the difference between data and information, and identify different types of data as image, audio, video and text. Define Information Age and discuss the importance of information literacy in a knowledge-based society. | <p>The components include the purposes, data, processes, technologies and personnel.</p> <p>Information processes include data collection, organisation, analysis, storage, processing, transmission and presentation. Examples from daily life, both computer and non-computer-based processes, should be used to consolidate and enhance students' understanding of the activities involved.</p> <p>How the development of technologies leads to the emergence of the Information Age, and how information can be flexibly and analytically converted into knowledge in modern society should be discussed.</p> |

A. Information Processing

c. Data Representation (10 hours) (partly extracted as example)

| Learning Outcomes | Remarks |
|--|---|
| <ul style="list-style-type: none">Convert integers from denary numbers to binary numbers or hexadecimal numbers, or vice versa.Perform simple calculations (addition and subtraction only) on binary numbers and analyse overflow errors.Know how characters are represented by using common international standards such as American Standard Code for Information Interchange (ASCII), the Big-5 code, the Guobiao (GB) code and the Unicode.Know briefly how different multimedia elements are digitised. Convert them into different file formats and compare them for storing the same data. | <p>Adopt two's complement for the representation of negative integers.</p> <p>In understanding errors, minimum and maximum numbers an n-bit can hold (maximum 2 bytes) should be considered.</p> <p>The relationship between the size of the character set and the representation should be explained. Recall of specific codes is not required.</p> <p>Elementary file conversion is required but not the editing of a file. Students should be given the experience in creating various file formats such as wav vs. mp3, bmp vs. jpg, and avi vs. mpeg2.</p> |

A. Information Processing

d. The Use of Office Automation Software (partly extracted as example)

| Learning Outcomes | Remarks |
|---|---|
| <ul style="list-style-type: none">Design and create formatted documents or reports effectively and suitably using a word-processing tool. | <p>Through meaningful tasks related to the real world, such as advertisements fliers, newsletters and reports, students are expected to apply formatting features such as tables, columns, text frames and graphics, with consideration of the use of colour, size and positioning in presenting their documents.</p> <p>Other features such as table of contents, indexes, footnotes, hyperlinks and checkers (e.g. Spelling checker) should be introduced to students to facilitate the writing of a report and to enhance the readability and accuracy of documents.</p> |
| <ul style="list-style-type: none">Convert between various document / text formats and justify their usage. | <p>Examples of text formats are rich text format, hypertext document format, portable document format and word document format.</p> |

A. Information Processing

e. Presentation of Information (5 hours)

- Construct and design a presentation incorporating multimedia elements.

The focus is on the planning of the storyboard and presentation, not the means of presentation. Students may choose a web-based presentation, a slide show, a multimedia document or other means of presentation.

The presentation should be supplemented with verbal annotation, to develop students' communication skills and encourage them to articulate ideas / thoughts.

B. Computer System Fundamentals

Learning Objectives

Students will learn about:

- the functions and properties of the **major components** of a computer system and how these components **interact together** to perform tasks;
- the functions and properties of major **peripheral devices**, and their uses in specific situations;
- the use of different **utility programs** in managing systems and files; and
- the capabilities of different **operating systems**, and the basic concepts of a **computer network** and its applications.

B. Computer System Fundamentals

Topics

| | hrs |
|-------------------------------|-----|
| a. Basic Machine Organisation | 15 |
| b. System Software | 4 |
| c. Computer Systems | 6 |
| Total: 25 | |

B. Computer System Fundamentals

a. Basic Machine Organisation (15 hours) (partly extracted as example)

| Learning Outcomes | Remarks |
|---|---|
| <ul style="list-style-type: none">Explain the functions of hardware within a computer system, namely input and output devices, the central processing unit, bus system and storage devices (both primary and secondary).Explain the structure and functions of a central processing unit (CPU) and its components. | Students should know how CPU is measured in terms of frequency. Units such as microsecond, nanosecond and picosecond should also be introduced. |
| <ul style="list-style-type: none">Outline the steps in the fetch-decode-execute cycle and store using a single processor, and describe the roles of and the interdependence among components, registers and buses in the machine cycle. | The functions of the program counter, accumulator, instruction register, memory address register and memory data register should be briefly introduced to students. No assembly language is involved but instructions requiring LOAD, ADD, STORE and STOP may be used to illustrate how data and instructions are processed in the machine cycle. |

B. Computer System Fundamentals

b. System Software (4 hours)

- Know the functions of system software and applications software, and the relationship between hardware, system software, applications software and users.
- Outline the basic functions of an operating system and describe some common operating systems, and their differences and applications.
- State the functions and needs of utility programs and driver programs.

Examples of the utilities are data compressors, virus checkers, file managers, defragmentation software and system monitoring software. Technical details of these programs are not required but demonstration or practice on their use should be given.

B. Computer System Fundamentals

c. Computer Systems (6 hours)

| Learning Outcomes | Remarks |
|---|---|
| <ul style="list-style-type: none">Compare the characteristics of different types of computers. | Types of computers include personal computers, mainframes, supercomputers, network computers, etc. Comparison should be made with respect to physical size, memory size, backing store capacity, input/output devices, processors, number of user supported, cost and applications. |
| <ul style="list-style-type: none">Distinguish the characteristics and applications of various computer systems. | Computers systems to be considered are batch processing systems, on-line interactive systems and real-time systems, single-user systems and multi-user systems, parallel processing systems and distributed processing systems, and network systems. |

C. Internet and Its Applications

Learning Objectives

Students will learn about:

- how to **connect** to the Internet, and the **hardware, software and Internet Service Provider** (ISP) involved in accessing the Internet;
- the personal, social and commercial **activities** that are available on the Internet;
- **how to participate** in various Internet activities such as searching for information, sharing opinions, and exchanging messages and files;
- the **technologies involved** in transmitting and displaying multimedia elements on the Internet; and
- the **design and construction of simple web pages** for an intended audience.

C. Internet and Its Applications

Topics

| | hrs |
|---------------------------------------|-----|
| a. The Networking and Internet Basics | 9 |
| b. Internet Services and Applications | 7 |
| c. Elementary Web Authoring | 12 |

Total: 28

C. Internet and Its Applications

a. The Networking and Internet Basics (9 hrs) (partly extracted as example)

| Learning Outcomes | Remarks |
|---|---|
| <ul style="list-style-type: none">Define and compare Local Area Network (LAN) and Wide Area Network (WAN).Discuss the common services available in a networked environment.Explain the functions of the hardware required for a network.Compare common methods for Internet access in terms of speed, cost, security and availability. | <p>Services include internal communications, conferencing and resources sharing.</p> <p>This includes communication links (phone line, coaxial cable, fibre optics, microwave, satellite, etc.), modem (including cable modem), network interface card, network connecting devices (hub, switch and router, etc.).</p> <p>This includes connections in wireless, leased line and broadband etc.</p> |

C. Internet and Its Applications

b. Internet Services and Applications (7 hrs) (partly extracted as example)

- Formulate an effective strategy for searching for specific information on the Web by using search-engines, and critically analyse the sources of information.
- Identify various graphics, audio, video file formats suitable for web pages. Use plug-ins and players for the multimedia elements found on the Internet.

C. Internet and Its Applications

c. Elementary Web Authoring (12 hours) (partly extracted as example)

| Learning Outcomes | Remarks |
|--|--|
| <ul style="list-style-type: none">Design and construct web pages, by writing HTML or by using a web authoring tool, for an intended audience and upload them onto the World Wide Web. <p>For S4 from Sept 2013 and onward</p> | <p>The organisation of information includes ease of navigation, appropriate placement of links, tables, frames and multimedia elements, colour combinations, background design, font size and style, for an intended audience.</p> <p>need not to memorize</p> <p>Although students may use a tool to write HTML codes for the creation of web pages, understanding and interpretation of HTML codes are essential.</p> |

D. Basic Programming Concepts

Learning Objectives

Students will learn about:

- the **systematic approach** to problem-solving;
- the application of concepts of systematic problem-solving to **real-life problems**;
- the use of **pseudocode** and/or a **program flowchart** to represent the algorithm;
- how to **identify the objectives of an algorithm**, trace the logical flow and examine values of variables during execution; and
- **various ways** of solving the same problem, and the differences between them.

D. Basic Programming Concepts

Topics

hrs

- | | |
|-------------------------------|----|
| a. Problem-Solving Procedures | 4 |
| b. Algorithm Design | 13 |
| c. Algorithm Testing | 3 |

Total: 20

D. Basic Programming Concepts

b. Algorithm Design (13 hours) (partly extracted as example)

- Define algorithm. Use pseudocode and program flowchart as methods for representing algorithms.
- Outline and discuss the input and output requirements of a problem, and design an appropriate user interface.
- Recognise the uses and nature of simple data types and data structures in solving a problem.

Simple data types are restricted to integer, real, character and Boolean while simple data structures are limited to string and one-dimensional array. Boolean logic (AND, OR, NOT) and truth tables should be introduced.

D. Basic Programming Concepts

b. Algorithm Testing (3 hours)

| | |
|---|--|
| <ul style="list-style-type: none">• Trace and test algorithms.• Compare different solutions to the same problem. | <p>Students need to identify boundary cases and generate appropriate test data.</p> <p>Comparison of the steps of operation and resource usage of different algorithms to solve the same problem should be encouraged.</p> |
|---|--|

E. Social Implications

Learning Objectives

Students will learn about:

- equity issues relating to access to ICT;
- health hazards and preventive measures in using ICT;
- major issues regarding intellectual property and privacy;
- the potential threats on the Internet and measures to reduce them; and
- the need to use ICT safely, sensibly, legally and ethically.

E. Social Implications

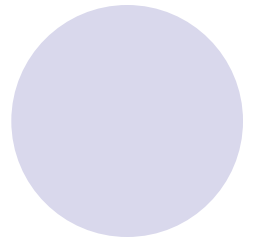
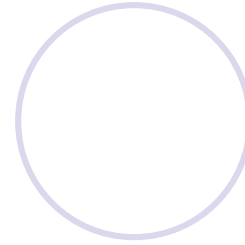
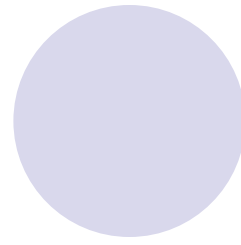
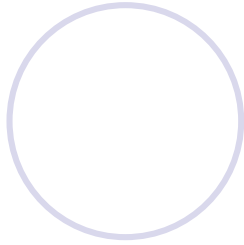
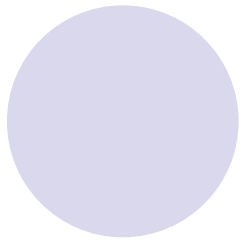
Topics

| | hrs |
|---|-----|
| a. Equity of Access | 2 |
| b. Work and Health Issues | 2 |
| c. Intellectual Property | 9 |
| d. Threats and Security on the Internet | 15 |
| Total: 28 | |

E. Social Implications

d. Threats and Security on the Internet (15 hrs) (partly extracted as example)

| Learning Outcomes | Remarks |
|--|---|
| <ul style="list-style-type: none">Know about security used in electronic transactions.Be aware of the latest developments in security measures. | <p>The concepts of Secure Sockets Layer (SSL) in secured transmission in e-commerce should be introduced.</p> <p>Other security measures in online transaction such as smart cards, security tokens, digital certificates and mobile Short Message Service (SMS) should also be introduced.</p> |



Breadth and Depth of the Curriculum

Action Verbs

- ICT C&A Guide P.9

- Each module or option is written with learning outcomes that use **action verbs** to indicate the thinking or practical skills that students should exhibit during the course of study:

| Examples of action verbs | Students need to demonstrate |
|---|---|
| Be aware of, know, define, write, list, relate, recognise, state | The recall and understanding of specific terms or facts and simple concepts. |
| Discuss, describe, explain, identify, demonstrate, apply, convert | The application of declarative knowledge and practical skills in particular contexts. |
| Distinguish, analyse, compare, evaluate, organise, prepare, test | The analysis of materials or systems into their constituent parts and the recognition of relationships between parts. |
| Develop, plan, design, construct, process, integrate, implement | The synthesis of concepts and skills from different areas into a plan for solving a problem or reaching a conclusion, and the transfer of learnt concepts and skills to new scenarios/situations. |

Examples from Practice Paper 1B Q1

Sample Question 1:

Mr Wong is responsible for setting up an inventory system in a supermarket. He creates a database table, **INVENTORY**, to store the information on products for sale. Part of **INVENTORY** is shown below:

INVENTORY

| CAT | CODE | NAME | PRICE | QTY |
|------------|----------------|----------------|--------------------|----------------------------|
| (Category) | (Product code) | (Product Name) | (Price of product) | (Number of items in stock) |
| Beverage | B163 | BEST juice | 10.0 | 10 |
| Snack | S968 | 좋은감자칩 | 12.2 | 40 |
| Noodle | N042 | 乐乐浓汤鸡面 | 20.2 | 20 |
| Beverage | B482 | FRESH tea | 25.9 | 80 |
| Noodle | N091 | QQ noodle | 8.4 | 50 |

Examples from Practice Paper 1B Q1

• Question 1b:

The data type of **QTY** is integer. Judy, Mr Wong's colleague, suggests changing it to real number or string. Mr Wong disagree with Judy's suggestion. **Why?**

• Solution:

Since the numbers of items in stock are whole numbers, there is no need to use real number data type to store them, which would require extra storage space.

Calculation on the numbers of items in stock is likely to be necessary and string data type is not appropriate.

| Topic | Learning Outcomes | Remarks |
|--|--|--|
| A. Information Processing b. Data Organisation and Data Control | Identify data, records, fields, files and databases in the hierarchical organisation of data. | |
| D. Basic Programming Concept d. Algorithm Design | Recognise the uses and nature of simple data types and data structures in solving a problem. | Simple data types are restricted to integer, real, character and Boolean while simple data structures are limited to string and one-dimensional array. |

Examples from Practice Paper 1B Q1

- Question 1c:
For storing data under **NAME**, **which** character encoding system is most suitable?
Explain briefly.
- Solution:
Unicode should be used,
because the product names are in different languages.

| Topic | Learning Outcomes | Remarks |
|---|---|--|
| A. Information Processing c. Data Representation | Know how characters are represented by using common international standards such as American Standard Code for Information Interchange (ASCII), the Big-5 code, the Guobiao (GB) code and the Unicode. | The relationship between the size of the character set and the representation should be explained . Recall of specific codes is not required. |

Examples from Practice Paper 1B Q1

• Question 1d (i):

Mr Wong writes the following SQL command. Based on the five given records in **INVENTORY** above, **what is the query result**?

Select CODE, PRICE from INVENTORY where PRICE > 10 and QTY < 40

• Solution:

N042 20.2

| Topic | Learning Outcomes | Remarks |
|---|--|---|
| A. Information Processing d. The Use of Office Automation Software | Practise data extraction and manipulation by querying a database and create reports. | This includes the selection, filtering and sorting of data using query. Students should be able to trace and interpret simple Structured Query Language (SQL) statements. Though sophisticated reports are not required, they should create and format reports for intended users / audience. |

Examples from Practice Paper 1B Q3

Sample Question 3:

Mr Law develops a computer system with the help of Ada and Ben. The system is used to find the equivalent grade for an input mark.

(a) Ada uses the following pseudocode to represent her algorithm.

```
Step 1:      Input a value into MARK
Step 2:      If MARK < 40 Then GRADE ← 'Unattained'
Step 3:      If MARK >= 40 Then GRADE ← 'Attained'
Step 4:      If MARK >= 80 Then GRADE ← 'Distinction'
Step 5:      Output GRADE
```

(ii) Ada modifies the pseudocode by applying iteration control structure in Step 1 so that the value of **MARK** is between 0 and 100 inclusive as shown below.

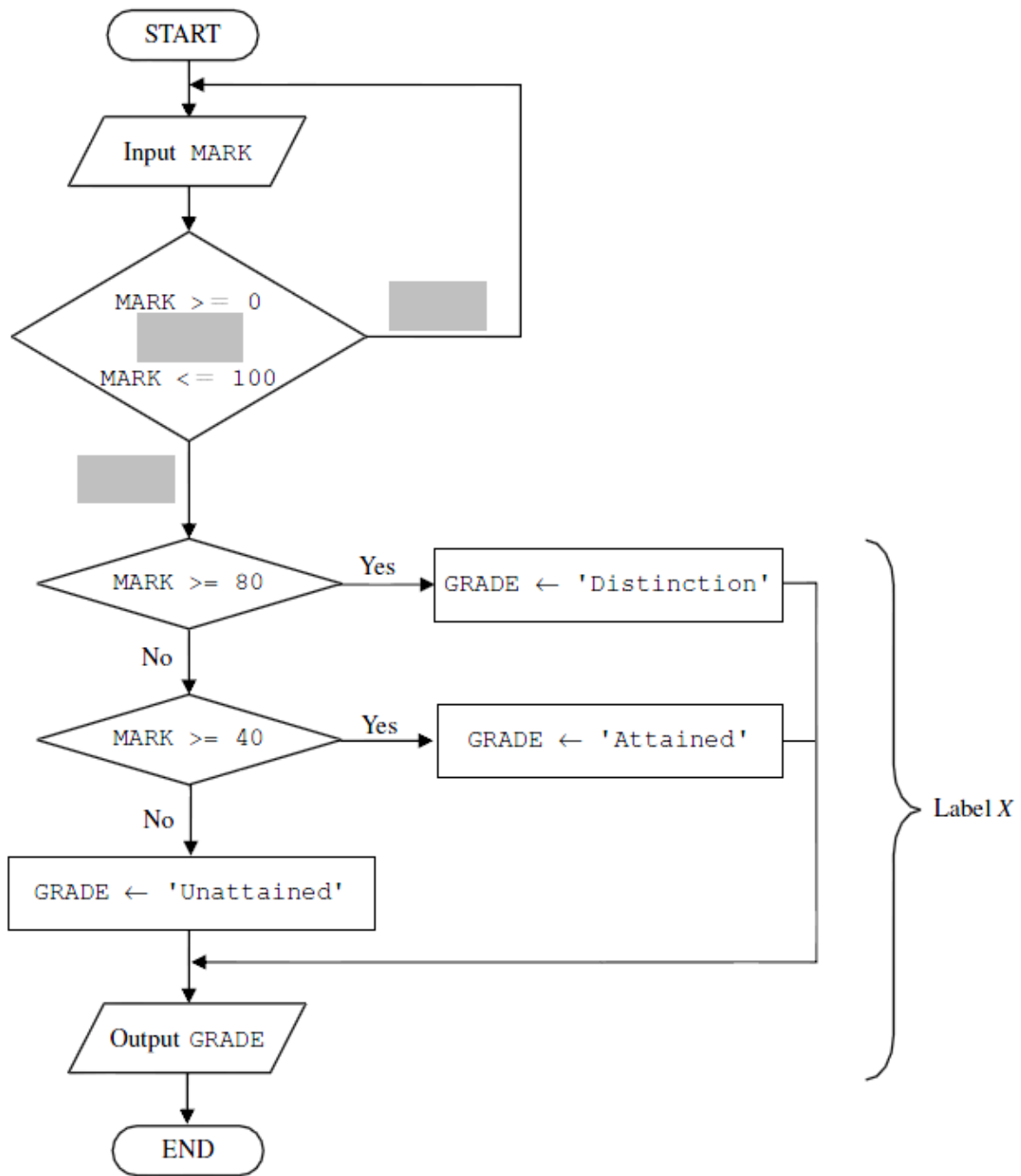
Step 1: Repeat the input of values into **MARK** when the value of **MARK** is smaller than 0 or larger than 100

Examples from Practice Paper 1B Q3

- Question 3 (a) (ii) (1):
Other than 0 and 100, give another test datum that can be used to identify the boundary cases of the algorithm.
- Solution:
-1 or 101

| Topic | Learning Outcomes | Remarks |
|--|----------------------------|--|
| D. Basic Programming Concepts c. Algorithm Testing | Trace and test algorithms. | Students need to identify boundary cases and generate appropriate test data. |

The Compulsory Part



Examples from Practice Paper 1B Q3

- Question 2b:
Compare the algorithm indicated by Label X with Ada's algorithm. Which one is more efficient? **Explain** briefly.
- Solution:
The algorithm indicated by Label X is more efficient because it executes a fewer number of comparisons in general.

| Topic | Learning Outcomes | Remarks |
|---|---|---|
| D. Basic Programming Concepts c. Algorithm Testing | Compare different solutions to the same problem. | Comparison of the steps of operation and resource usage of different algorithms to solve the same problem should be encouraged. |

Examples from Practice Paper 1B Q3

• Question 3 (d):

A workstation in the system provides a virtual keyboard on the screen which can be used to enter the marks.

(i) Give one advantage and one disadvantage of this design..

• Solution:

Advantage: The design is compact. / fewer peripherals

Disadvantage: It is not a good ergonomic design. / The keyboard location is rigid. / It occupies the a portion of the screen.

| Topic | Learning Outcomes | Remarks |
|--|---|--|
| B. Computer System Fundamentals a. Basic Machine Organisation | Describe the features, advantages, disadvantages and applications of the input and output devices. Select and justify the use of appropriate devices for collecting and displaying information in a given context. | Students should know the various hardware devices used for collecting and displaying different types of data such as image, audio, video and text. The technical details on how each device operates are not required. |

Examples from Practice Paper 1B Q5

Sample Question 5:

Peter wants to study the air quality in Shatin and Kwun Tong. He downloads the air quality monitoring data from the website of the Environmental Protection Department, as shown below:

The screenshot shows a web application window titled "Environmental Protection Department". Inside the window, the title "Air Quality Monitoring Data" is centered. Below the title, a message states: "You have selected the *Shatin* Station. Data is available from 1-7-2008 to 30-9-2010." Below this message, there are two date selection sections: "From:" and "To:". Each section contains three dropdown menus for "Day", "Month", and "Year". The "From:" section has values 01, 01, and 2010. The "To:" section has values 31, 01, and 2010. The "Year" dropdown for the "From:" section is open, showing a list of years: 2008, 2009, and 2010. At the bottom of the form, there are three buttons: "Display", "Download", and "Reset".

| From: | | | To: | | |
|-------|-------|------|-----|-------|------|
| Day | Month | Year | Day | Month | Year |
| 01 | 01 | 2010 | 31 | 01 | 2010 |
| | | 2008 | | | |
| | | 2009 | | | |
| | | 2010 | | | |

Buttons: Display, Download, Reset

Examples from Practice Paper 1B Q5

- Question 5 (a) (i):
In the web page above, **how** can the use of drop-down lists help with data input?
- Solution:
It can minimise the input error.

| Topic | Learning Outcomes | Remarks |
|---|--|---|
| C. Internet and its Applications c. Elementary Web Authoring | Design and construct web pages, by writing HTML or by using a web authoring tool, for an intended audience and upload them onto the World Wide Web. | <p>The organisation of information includes ease of navigation, appropriate placement of links, tables, frames and multimedia elements, colour combinations, background design, font size and style, for an intended audience.</p> <p>Although students may use a tool to write HTML codes for the creation of web pages, understanding and interpretation of HTML codes are essential.</p> |

HKEAA – Subject Information – ICT – Other Resources

Hong Kong Diploma of Secondary Education Examination Information and Communication Technology

The following SQL commands and spreadsheet functions will be provided to candidates' reference:

Database (SQL commands – based on SQL-92 Standard)

| | |
|-----------|--|
| Constants | FALSE, TRUE |
| Operators | +, −, *, /, >, <, =, >=, <=, <>, %, _ , ' , AND, NOT |
| SQL | ABSOLUTE (ABS), AVG, INT, MAX, MIN, SUM, COUNT ASC, AT, CHAR (CHR), CHAR_LENGTH (LEN), LOWER, TRIM, SPACE, SUBSTRING (SUBSTR/MID), UPPER, VALUE (VAL) DATE, DAY, MONTH, YEAR ADD, ALL, ALTER, ANY, AS, ASC, BETWEEN, BY, CREATE, DELETE, DESC, DISTINCT, DROP, EXISTS, FROM, GROUP, HAVING, IN, INDEX, INNER JOIN, INSERT, INTEGER, INTERSECT, INTO, LEFT [OUTER] JOIN, LIKE, MINUS, NULL, RIGHT [OUTER] JOIN, FULL [OUTER] JOIN, ON, ORDER, SELECT, SET, TABLE, TO, UNION, UNIQUE, UPDATE, VALUES, VIEW, WHERE |

**Not necessary
to teach ALL
commands.**



School-Based Curriculum Planning

School-Based Curriculum Planning

- The sequence is not mandatory
- Schools may consider the relation between the Compulsory Part and the Elective Part
- Schools may consider to re-group some topics from different modules
-

Curriculum Planning Case 1

| Teaching Sequence and Time Allocation | | | | |
|---------------------------------------|-------|------------------|------------------------------------|--------------------------------------|
| Curriculum Time | Level | Compulsory Part | Elective Part | SBA |
| 105 hours | S4 | IP (64 hours) | | |
| | | CSF (25 hours) | | |
| | | I & A (28 hours) | | |
| 105 hours | S5 | | | <div> <div></div> <div></div> </div> |
| | | BPC (20 hours) | | |
| | | SI (28 hours) | | |
| 60 hours | S6 | | One of the four options (75 hours) | <div> <div></div> <div></div> </div> |

IP
CSF
I&A
BPC
SI
SBA

Information Processing
Computer System Fundamentals
Internet and its Applications
Basic Programming Concept
Social Implications
School-based Assessment

Curriculum Planning Case 2

Teaching Sequence and Time Allocation

| Curriculum Time | Level | Compulsory Part | Elective Part | SBA |
|-----------------|-------|------------------|----------------------|-----|
| 105 hours | S4 | IP (64 hours) | | |
| | | | Databases (75 hours) | |
| 105 hours | S5 | | | |
| | | CSF (25 hours) | | |
| | | I & A (28 hours) | | |
| 60 hours | S6 | BPC (20 hours) | | |
| | | SI (28 hours) | | |

SBA
(30 hours)

IP
CSF
I&A
BPC
SI
SBA

Information Processing
Computer System Fundamentals
Internet and its Applications
Basic Programming Concept
Social Implications
School-based Assessment

Curriculum Planning Case 3

Teaching Sequence and Time Allocation

| Curriculum Time | Level | Compulsory Part | Elective Part | SBA |
|-----------------|-------|------------------|------------------------------------|---|
| 80 hours | S4 | IP (52 hours) | | |
| | | I & A (28 hours) | | |
| 130 hours | S5 | IP (12 hours) | | <div>↑</div> <div>SBA (30 hours)</div> <div>↓</div> |
| | | CSF (25 hours) | | |
| | | BPC (20 hours) | | |
| | | SI (28 hours) | | |
| 60 hours | S6 | | One of the four options (75 hours) | |

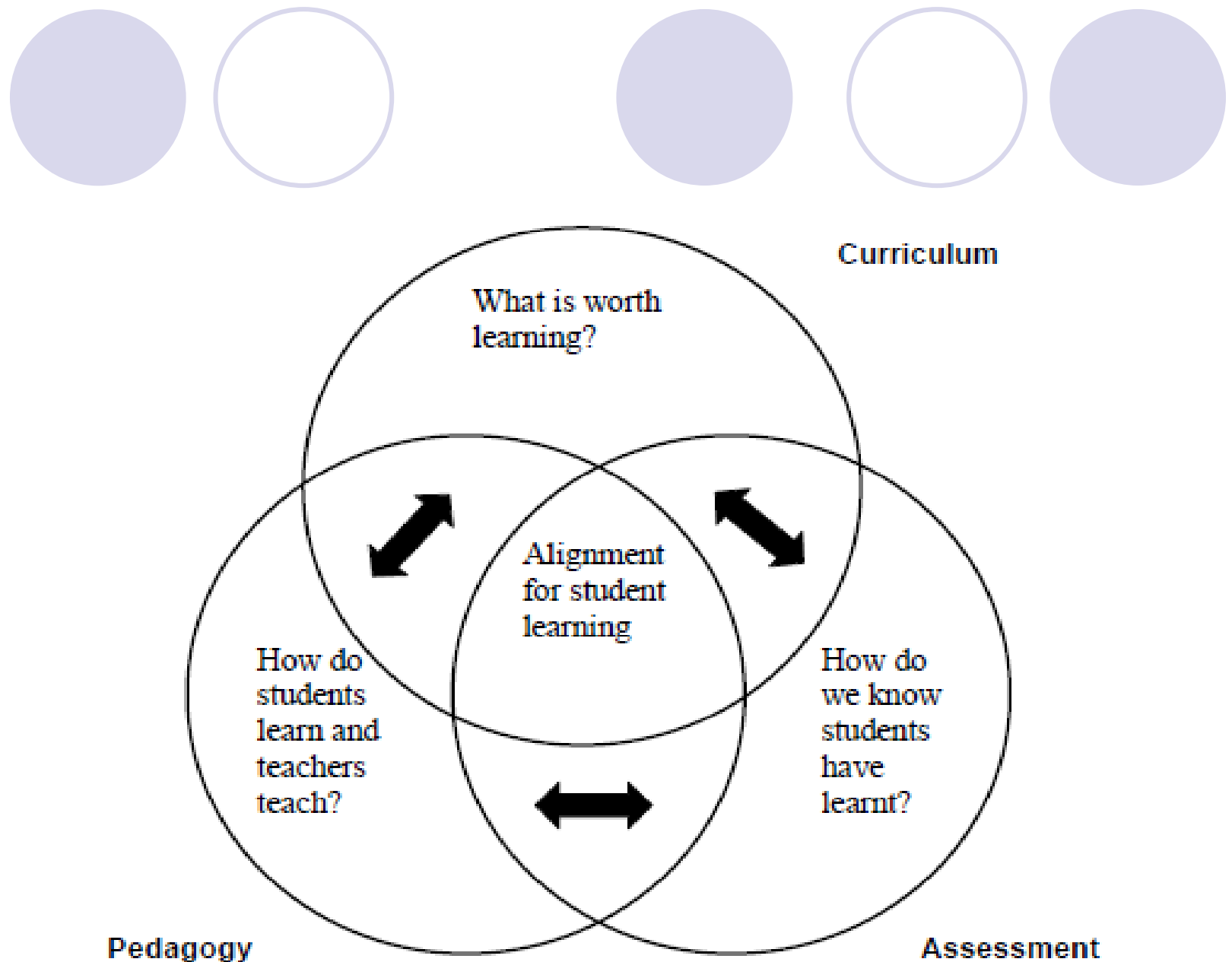
IP
CSF
I&A
BPC
SI
SBA

Information Processing
Computer System Fundamentals
Internet and its Applications
Basic Programming Concept
Social Implications
School-based Assessment

Learning & Teaching Approaches and Strategies

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The Compulsory Part



Developing Content Knowledge: IPO Cycle of a Vending Machine

Example 1

Compulsory Part

Module: *A Information Processing*

Topic: *a Introduction to Information Processing*

Theme: The input-process-output cycle of a vending machine

Students are asked to describe the working cycle of a vending machine in terms of input, process and output. Students may come to a conclusion that a stored program which follows the input-process-output cycle governs a vending machine.

In the process of developing this conclusion, students need to identify and examine the components of an information system (the vending machine). In doing so, they may discover that many daily-life incidents – both computer-based and non-computer-based processes – are examples of information-processing.

Developing Values & Attitudes: Software Licensing Schemes

Example 5

Compulsory Part

Module: *E Social Implications*

Topic: *c Intellectual Property*

Theme: A debate on the benefits and risks of different software licensing schemes

Students have to debate the benefits and risks of different licensing schemes such as freeware, shareware, open source software and copyrighted software from the perspectives of users and software developers.

In this activity, students develop positive values and attitudes towards the ideas of intellectual property and copyright, and then are more aware of the ways to reduce intellectual property theft on digital property.

Direct Instruction: Creating Formatted Documents

Example 6

Compulsory Part

Module: *A Information Processing*

Topic: *d The Use of Office Automation Software*

Theme: Designing and creating effective formatted documents or reports using a word-processing tool.

This class is conducted in the computer room. The teacher demonstrates how to perform various formatting features, such as tables, columns, text frames and graphics, using a computer and projector. After the demonstration, the students practise on their computers, the teacher observes them and gives feedback. Through individual practice, students learn various formatting methods and note the effects of the formatting features. This knowledge and skill gives them the background for performing more meaningful tasks such as creating advertisement fliers and newsletters in the future.

Co-construction: Infringement of Copyright

Example 10

Compulsory Part

Module: *E Social Implications*


Topic: *c Intellectual Property*

Theme: *e-forum on acts of infringement of copyright*

Teachers can make use of the school intranet to allow discussion between themselves and students, and among students. They can start an e-forum on the topic “Social, legal and economic implications of acts of infringement of copyright”. Each student is required to post an item of news, a court case, a URL etc. related to the issue, and then give his/her views on the material posted by other students. The teacher should participate on a regular basis, encourage critical thinking, and prompt students to think logically and provide evidence to support their opinions. By sharing his/her thoughts through this electronic platform, each participant also gains deeper understanding of the topic being discussed.

Discussion/debate can be carried out outside the classroom. Feedback and reflection may lead to new questions and the cycle of learning moves forward. Students discuss and answer each other's questions at any time they like. Sometimes they may include topics beyond the curriculum.

Review of New Senior Secondary Curriculum in 2012/2013

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Category

[Curriculum](#)

[Assessment](#)

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[School Curriculum Planning](#)

[Consultation Documents & Reports, Circulars to Schools, Publications & Multimedia](#)

[Multiple Pathways for NSS Graduates](#)

[Related Activities—Activities for Schools & Parents and Other Activities](#)

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[New Academic Structure Web Bulletin](#) > [Review of the New Academic Structure](#)

Review of the New Academic Structure

Introduction

- ["Introduction to NAS Review"](#)
- [Letter to Schools on "Review of New Academic Structure – Senior Secondary Curriculum, Assessment, Interfaces" \(21.09.2012\)](#)

School survey on Review of New Senior Secondary Curriculum and Assessment

- [Press release](#)
- [Letter to Schools on "School Survey and Briefing Session on Review of New Senior Secondary Curriculum and Assessment"](#)
- [Briefing Session on School Survey on New Senior Secondary Curriculum and Assessment](#)
- ["Review of the New Academic Structure – School Survey on New Senior Secondary Curriculum and Assessment \(November – December 2012\)" – Preamble](#)
- [List of Questionnaires](#)

Progress Report on the New Academic Structure Review: The New Senior Secondary Learning Journey – Moving Forward to Excel

- [Recommendations for the Review of the New Senior Secondary Curriculum & Assessment \(EDB CM No. 48/2013\)](#) **NEW!**
- [Executive Summary](#)
- [Full report](#)
- [NAS Review: The New Senior Secondary Learning Journey – Moving Forward to Excel \(for reference of principals and teachers\) \(19.4.2013\)](#)
- [Information sheets on curriculum and assessment of NSS subjects \(student version\) \(for reference of S4, S5 and S6 students in 2013/14 school year\)](#) **NEW!**

Review of the New Academic Structure



2013 HKDSE Information for Schools

2012 NSS Graduates Information Recall

Activities

International



Local

- [Activities for Schools](#)
- [Activities for Parents](#)
- [Activities for Employers](#)
- [Other Activities](#)



EDB Circular Memorandum 48/2013

Education Bureau Circular Memorandum No. 48/2013

From: Permanent Secretary for Education To: Supervisors / Heads of all aided,
Ref.: EDB(CD/C&S)/SC/1/1/1 (3) government and caput secondary
Date: 30 April 2013 schools, secondary schools under the
Direct Subsidy Scheme and special
schools with secondary classes

Recommendations for the Review of the New Senior Secondary Curriculum & Assessment

| Subject | Short-term (Effective from 2013/14 sy) | Medium-/Long-term (Issues to explore) |
|--|---|--|
| Information and Communica- tion Technology | <ul style="list-style-type: none">· Update and revise curriculum content: Fine-tune 4 curriculum topics (S4; 2016 HKDSE)· Streamline SBA (S5; 2015 HKDSE)· Revise the list of SQL commands and spreadsheet functions provided on exam papers for candidates' reference (S4; 2016 HKDSE) | |

Briefing Session (May 15, 2013)

CDI020131133

Briefing Sessions on the New Senior Secondary (NSS) Learning Journey – Recommendations for Fine-tuning the NSS Curriculum and Assessment (24 NSS subjects, Applied Learning and Other Learning Experiences) – Information and Communication Technology
Curriculum Development Institute

2013/04/12 12:01

2013/04/12 12:01

| Event (ID) | Session | Date | Time | No. of Hours | Venue | Speaker(s) / Facilitator(s) | Max. no. of participants |
|------------|---------|------------------|---------------|--------------|--|---|--------------------------|
| AA | 1 | 2013/05/15 (Wed) | 15:00 - 17:00 | 2.0 | School Hall, Lam Tai Fai College, 25 Ngan Shing Street, Shatin, NT | Members of the CDC-HKEAA Committee on Information and Communication Technology (Senior Secondary), Representative from the Hong Kong Examinations and Assessment Authority, and EDB Curriculum Development Officers | 400 |

A. Information Processing

d. The Use of Office Automation Software (p.15)

| Topic | Learning Outcomes | Remarks |
|-------|---|---|
| | <ul style="list-style-type: none"> • Apply spreadsheets as a data analysis tool by using a pivot table (and pivot chart), and “what-if” scenarios. • Apply the concepts of data organisation to create and maintain a simple database using a Database Management Systems (DBMS) tool. • Create and use a form for data entry. • Practise data extraction and manipulation by querying a database and create reports. | <p>Through task-based activities, apart from the basic features and functions (sum, sub-total and average) of a pivot table, students should be led to observe and analyse the interdependency of data by varying the fields in a pivot table.</p> <p>Together with charting, simulating real-life situations and “what-if” scenarios, students should learn to identify trends, to make informed judgments, and to produce meaningful predictions which are required as critical thinkers throughout their careers.</p> <p>in a single database table</p> <p>This includes the selection, filtering and sorting of data using query. Students should be able to trace and interpret simple Structured Query Language (SQL) statements. Though sophisticated reports are not required, they should create and format reports for intended users / audience.</p> |

C. Internet and Its Applications

c. Elementary Web Authoring (p.25-26)

| | Recognise | |
|--|---|--|
| c. Elementary Web Authoring (12 hours) | <ul style="list-style-type: none"> Practise the basic constructs of Hypertext Markup Language (HTML) which is a means to address cross-platform issues. | |

| Learning Outcomes | Remarks |
|--|--|
| <ul style="list-style-type: none"> Design and construct web pages, by writing HTML or by using a web authoring tool, for an intended audience and upload them onto the World Wide Web. | <p>The organisation of information includes ease of navigation, appropriate placement of links, tables, frames and multimedia elements, colour combinations, background design, font size and style, for an intended audience.</p> <p>Although students may use a tool to write HTML codes for the creation of web pages, understanding and interpretation of HTML codes are essential.</p> |

need not to memorize the HTML codes,

E. Social Implications

c. Intellectual Property (p.33)

d. Threats and Security on the Internet (p.34)

| Learning Outcomes | Remarks |
|---|---|
| <ul style="list-style-type: none"> Be aware of ways to reduce intellectual property theft on digital property. Know some of the legal consequences, especially in education, related to the infringement of copyright in Hong Kong. | <p>Examples of measures are the use of a digital watermark and digital signature.</p> <p>Teachers can quote some of the legal consequences related to infringement of copyright (e.g. Copyright Ordinance: Chapter 528, Section 4, 29, 60 and 61).</p> |

| Learning Outcomes | Remarks |
|---|---|
| <ul style="list-style-type: none"> Discuss the possible privacy threats on the Internet, and suggest ways to maintain privacy. | <p>Supported by crimes reported in the news, violation of the secrecy of data as a result of eavesdropping, hacking, phishing, spamming and junk mails etc. should all be considered and discussed with students.</p> <p>The ways to maintain privacy, such as anonymity and passwords, should be stressed.</p> <p>Teachers can quote some of the legal consequences related to unauthorised access to computers (e.g. Crimes Ordinance: Chapter 106, Section 27A, Chapter 200, Section 59, 60 and 161).</p> |

Suggested list of SQL commands and spreadsheet functions

2016 Hong Kong Diploma of Secondary Education Examination Information and Communication Technology

The following SQL commands and spreadsheet functions will be provided in Paper 1 (Section B) for candidates' reference:

Database (SQL commands – based on SQL-92 Standard)

| | |
|-----------|---|
| Constants | TRUE, FALSE |
| Operators | +, -, *, /, >, <, =, >=, <=, <>, %, _, ' , AND, NOT, OR |
| SQL | ABSOLUTE (ABS), AVG, INT, MAX, MIN, SUM, COUNT, AT, CHAR_LENGTH (LEN), LOWER, TRIM, SPACE, SUBSTRING (SUBSTR/MID), UPPER, AS, BETWEEN, BY, ASC, DESC, DISTINCT, FROM, GROUP, HAVING, LIKE, NULL, ORDER, SELECT, UNIQUE, WHERE |

Electronic Spreadsheet

| | |
|-----------|---|
| Constants | TRUE, FALSE |
| Operators | +, -, *, /, <, >, =, <>, <=, >= |
| Functions | ABS, INT, RAND, SQRT, ROUND, AND, NOT, OR, CHAR, CONCATENATE (&), ISBLANK, LEFT, LEN, LOWER, MID, PROPER, RIGHT, TEXT, TRIM, UPPER, VALUE, AVERAGE, COUNT, COUNTA, COUNTBLANK, COUNTIF, MAX, MIN, RANK, SUM, SUMIF, FIND, VLOOKUP, IF |

The text "Thank you!" is centered on the slide. It is surrounded by five light purple circles. Two circles are in the top row, and three are in the bottom row. The top-left circle is an outline, while the other four are solid. The text "Thank you!" is written in a bold, blue, sans-serif font and is positioned over the top-left circle.

Thank you!