ICT Curriculum Aims

- Provide students with a body of essential knowledge, concepts and applications of information, communication and computer systems.
- Equip students with problem-solving and communication skills, and encourage them to think critically and creatively.
- Develop students into competent, effective, discriminating, ethical and confident users of ICT, so as to support their life-long learning.
ICT Learning Objectives

- Know and understand the range and organization of computer systems, and the inter-relationship among hardware, software and data;
- Use a range of applications software effectively, ethically and with discrimination to support information processing and problem solving;
- Understand the methods of analysing problems, the planning and implementation of solutions using ICT, and practice in applying these methods;
- Realise the social, ethical and legal issues pertaining to the use of ICT; and
- Develop responsible attitudes towards the use of ICT and value themselves as productive participants in the development of ICT.
Curriculum Framework of ICT

The Compulsory Part (165 hours)

A. Information Processing (64 hours)
B. Computer System Fundamentals (25 hours)
C. Internet and its Applications (28 hours)
D. Basic Programming Concepts (20 hours)
E. Social Implications (28 hours)

The Elective Part (75 hours)
(Choose one)

A. Databases
B. Data Communications and Networking
C. Multimedia Production and Web Development
D. Software Development

School-based Assessment (30 hours)
Major changes on Compulsory/Elective Parts since 1<sup>st</sup> Consultation

- Survey result showing e-Commerce was the least favoured option.
- Suggestions to subsume the essential components of e-Commerce into various topics in the Compulsory Part such as *Internet and its Applications* and *Social Implications*.

  e-Commerce is deleted from the Elective Part,
  Essential components subsume in the Compulsory Part –  
  *Internet and its Applications* and *Social Implications*

- Views that Databases is too difficult for average students.
- Controversial on whether Databases should be a compulsory topic studied by all students or an option.

  Databases is removed from the Compulsory Part
  Databases is offered as an option in the Elective Part
## Curriculum Framework of ICT

<table>
<thead>
<tr>
<th>Module / Option</th>
<th>Suggested time allocation (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Compulsory Part</strong></td>
<td></td>
</tr>
<tr>
<td>A. Information Processing</td>
<td>64</td>
</tr>
<tr>
<td>B. Computer System Fundamentals</td>
<td>25</td>
</tr>
<tr>
<td>C. Internet and its Applications</td>
<td>28</td>
</tr>
<tr>
<td>D. Basic Programming Concepts</td>
<td>20</td>
</tr>
<tr>
<td>E. Social Implications</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total Compulsory Part</strong></td>
<td><strong>165</strong></td>
</tr>
<tr>
<td><strong>The Elective Part</strong></td>
<td></td>
</tr>
<tr>
<td>(Choose one)</td>
<td></td>
</tr>
<tr>
<td>B. Databases</td>
<td>75</td>
</tr>
<tr>
<td>C. Data Communications and Networking</td>
<td>75</td>
</tr>
<tr>
<td>D. Multimedia Production and Web Development</td>
<td>75</td>
</tr>
<tr>
<td>D. Software Development</td>
<td>75</td>
</tr>
<tr>
<td><strong>School Based Assessment</strong></td>
<td><strong>30</strong></td>
</tr>
<tr>
<td><strong>Total Curriculum Time</strong></td>
<td><strong>270 hours</strong></td>
</tr>
</tbody>
</table>
Order and Organisation of Modules/Options

- The order of the modules and options is arbitrary and immaterial.
- The organisation of individual module or option represents one possible way of organising the curriculum content.
- Teachers may structure and design teaching schemes according to their school situations, student needs, interests and abilities.
The Compulsory Part

They are 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 revised ASCA (Office and Internet Applications), the revised ALCS (Computer Organization) and CIT (Basic Programming Concepts and Social Implications).
The Elective Part

They are the specialized and extended areas of ICT which

- are designed for students to pursue further studies in tertiary education or joining workforce upon completion of the course.
- provide students in-depth study of an option of their own choice (e.g. *Software Development*).
- incorporate and revise topics from the revised ASCA (*Databases* and *SOHO Networking*), the revised ALCS (*Systems Development and Programming*) and CIT (*Multimedia Production*)
The Presentation and the Coherence of the Curriculum

Overall Aims (p.2)

The Major Learning Objectives (p.5)

The Learning Outcomes of each topic

The Learning Objectives of each Module / Option
### E. Social Implications

<table>
<thead>
<tr>
<th>Topics</th>
<th>Suggested time allocation (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity of Access</td>
<td>2</td>
</tr>
<tr>
<td>Work Issues</td>
<td>2</td>
</tr>
<tr>
<td>Intellectual Property</td>
<td>9</td>
</tr>
<tr>
<td>Security on the Internet</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>
E. Social Implications

Have you heard about these news lately?

- Internet gamers steal “points” and “tools” from others
- Fraud cases involving fake emails and websites
- Controversy in sharing movies and songs using BitTorrent technology
- Teenagers hospitalized after playing on-line games continuous for 10 hours
- …

Issues that need to be addressed in the society, perhaps, most effective through education.
E. Social Implications

We believe our students need to

- Understand equity issues relating to the access of ICT.
- Understand health hazards and recognise preventive measures in using ICT.
- Understand major issues regarding intellectual property and privacy.
- Aware the potential threats on the Internet and demonstrate measures to reduce the threats.
- Appreciate the need to use ICT safely, sensibly, legally and ethically.
E. Social Implications

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- Understand equity issues relating to the access of ICT.
- Understand health hazards and recognise preventive measures in using ICT.
- Understand major issues regarding intellectual property and privacy.
- Aware the potential threats on the Internet and demonstrate measures to reduce the threats.
- Appreciate the need to use ICT safely, sensibly, legally and ethically.
E. Social Implications

Understand health hazards

- Identify health hazards associated with the use of computer … (p.23)

Recognise preventive measures

- … propose good ergonomic practices when using computers. (p.23)
E. Social Implications

Aware the potential threats on the Internet

- Know, from users’ perspective, possibly security threats on networks and the Internet. (p.24)
- Discuss the possible privacy threats… (p.24)

Demonstrate measures to reduce the threats

- Examine ways to reduce IP theft… (p.24)
- Demonstrate the control of automatic intrusion using built-in security functions of a browser. (p.24)
Revisit: ICT Curriculum Aims

- Provide students with a body of essential knowledge, concepts and applications of information, communication and computer systems.
- Equip students with problem-solving and communication skills, and encourage them to think critically and creatively.
- Develop students into competent, effective, discriminating, ethical and confident users of ICT, so as to support their life-long learning.
The Elective Part

A. Databases

<table>
<thead>
<tr>
<th>Topics</th>
<th>Suggested time allocation (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Database</td>
<td>8</td>
</tr>
<tr>
<td>Relational Database</td>
<td>28</td>
</tr>
<tr>
<td>Introduction to Database Design Methodology</td>
<td>18</td>
</tr>
<tr>
<td>Database Security, Integrity and Data Privacy</td>
<td>13</td>
</tr>
<tr>
<td>Database Applications, Development and Society</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>
A. Databases

Contents adopted and revised from Databases module of AS Computer Application Curriculum to be implemented from Sep 2005
A. Databases

Additional contents (1)

- Include “Database Security, Integrity and Data Privacy” topic to further achieve ICT curriculum aims

- “Discuss the importance of data privacy and develop proper attitudes to be an ethical user of database to respect data privacy. (p.28)”

Revisit: ICT Curriculum Aims

- develop students into competent, effective, discriminating, ethical and confident users of information and communication technologies, so as to support their life-long learning.
A. Databases

Additional contents (2)

Include “Database Applications, Development and Society” topic to let students aware of database development and its impact on society to further achieve ICT curriculum aims.

Revisit: ICT Curriculum Aims

provide students with a body of essential knowledge, concepts and applications of information, communication and computer systems.
The Elective Part

B. Data Communications and Networking

Time allocation: 75 hrs

With a focus on practical knowledge and skills

Data Communications and Networking Basics (38 hrs)

Network Design and Implementation (26 hrs)

Network Management and Security (11 hrs)

With a focus on basic theoretical knowledge
B. Data Communications and Networking

Computer networks are everywhere!

Networking is used in every aspects of life – school, office, home, café... It has already become an essential infrastructure of every modern society.
We believe our students need to

- know the basic concepts and technologies behind data communications and networking;
- be able to identify and describe the functions of components involved in Ethernet and wireless networks;
- be able to describe the uses and applications of a network;
- be able to design and implement a simple network;
- be able to assess the performance of a network and implement measures to improve it;
- know the importance of network security and be able to propose measures to improve it; and
- observe and appreciate the latest developments and the future trends of networking technology.
We believe our students need to

- know the basic concepts and technologies behind data communications and networking;
- be able to identify and describe the functions of components involved in Ethernet and wireless networks;
- be able to describe the uses and applications of a network;
- be able to design and implement a simple network;
- be able to assess the performance of a network and implement measures to improve it;
- know the importance of network security and be able to propose measures to improve it; and
- observe and appreciate the latest developments and the future trends of networking technology.
Know the importance of network security
Describe the potential risks caused by the common network security threats… (p.34)

Propose measures to improve it
Propose effective measures to improve network security… (p.34)
## B. Data Communications and Networking

Comparsion between ICT and Revised ASCA (Networking)

<table>
<thead>
<tr>
<th>ICT</th>
<th>Revised ASCA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Communications and Networking Basics</strong></td>
<td>SOHO Networking Basics</td>
</tr>
<tr>
<td><strong>Network Design and Implementation</strong></td>
<td>SOHO Network Design and Implementation</td>
</tr>
<tr>
<td><strong>Network Management and Security</strong></td>
<td>SOHO Network Management and Security</td>
</tr>
</tbody>
</table>
New topics on Communication Technology have been added.

Rationales:

Communication Technology is important (recall the 1st aim of ICT Curriculum). It is the advancement in Communication Technology that makes the frequent and widespread of information possible.

It is the high-order thinking and knowledge involved in the topics that distinguish the subject from skill-based training courses.
New topics under ‘Basic concepts of data communications’
Communication models
Data encoding
Transmission media
Error detection methods
Asynchronous and synchronous transmission
Multiple access techniques

New topics under ‘Networking technologies’
TCP/IP protocol suites
Mobile cellular system design

New topics under ‘Network applications’
Mobile computing applications
Roles in networking environment
## The Elective Part

### C. Multimedia Production and Web Development

<table>
<thead>
<tr>
<th>Topics</th>
<th>Suggested time allocation (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multimedia Production</strong></td>
<td></td>
</tr>
<tr>
<td>• Multimedia Applications</td>
<td></td>
</tr>
<tr>
<td>• Basic Concepts and Use of Different Multimedia Elements</td>
<td>24</td>
</tr>
<tr>
<td><strong>Design Factors for Presenting Information on the Internet</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Web Development</strong></td>
<td></td>
</tr>
<tr>
<td>• Website Development using Web Authoring Tool</td>
<td></td>
</tr>
<tr>
<td>• Enhance the Dynamics and Interactive Features of Web Pages - Client-Side Scripting</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>75</td>
</tr>
</tbody>
</table>
C. Multimedia Production and Web Development

Why do we learn to write web pages?
We need to distribute information / make our products known to the world.

a. i. Multimedia Applications (p. 36)
What do we need to know to write web page?
We need the basic concepts, technologies and tools.
   ii. Basic Concepts and Use of Different Multimedia Elements (p. 36)

Revisit: ICT Curriculum Aims
Provide students with essential knowledge, concepts and applications of information, communication and computer systems.
To help students to create effective web pages:

Good Design  
Informational and Interesting

b. Design Factors for Presenting Information on the Internet (6 hours)

- Recognise the essential factors to be considered in their design strategy during the planning stage.
  
  With the demonstration of some sampled websites, students should understand factors such as audience awareness, content purpose, website structure, … etc.

It's easy to teach someone how to create a web page but it's difficult to teach them how to design an effective web page.

Learn good design by looking at bad design

Revisit: ICT Curriculum Aims

Equip students with problem-solving and communication skills, and encourage them to think critically and creatively.
To help students to create effective web pages:

Advanced tools / scripting

1. Website Development using Web Authoring Tool (p.37)

   Construct web pages using Web Authoring Tool.

   Students should be able to use links, anchors, lists, tables, frames, Mailto and Fill-out Forms in constructing the web page. ...

ii. Enhance the Dynamics and Interactive Features of Web Pages - Client-Side Scripting

   Create dynamic menus upon user selection.

   Students should be able to create a 2 level interdependent select list, pull down menu and click-to-expand menu.

   Validate and manipulate input data.

   Students should be able to check text data, numeric data, required input, length of input, manipulate radio and check box and valid values for all input data. …

Revisit: ICT Curriculum Aims

- Develop students into competent, effective, discriminating, ethical and confident users of ICT, so as to support their life-long learning.
D. Software Development

Three-fold Aim

- To introduce students programming concepts, programming languages and concepts of systems development
- To develop problem-solving skills through algorithm design and programming
- To improve students' logical thinking and critical thinking skills
D. Software Development

Time allocation: 75 hrs

- Programming Languages (12 hours)
- Systems Development (16 hours)
- Programming (47 hours)
D. Software Development

We believe our students need to
- Define and analyse problems;
- Identify the steps involved in writing a program for problem solving;
- Realise the importance of good programming skills and develop good programming styles;
- Apply structured programming and simple constructs to program writing;
- Recognise the importance of algorithms, think and formulate critically appropriate algorithms to solve problems;
- Demonstrate creativity in designing and developing computer programs;
- Debug the errors, and ensure that the programs are executable as expected;
D. Software Development

We believe our students need to

- Prepare program documentation to summarise the design and to improve the readability of a computer program;
- Illustrate different programming paradigms with appropriate programming languages;
- Discuss the choice of different languages for meeting different needs;
- Recognise the importance of a systematic approach to software development;
- Apply concepts underlying software development in a systematic way; and
- Describe the phases, activities and methodologies involved in systems development.
**D. Software Development**

### Programming

<table>
<thead>
<tr>
<th>(ICT Vs CIT) Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data representation</td>
</tr>
<tr>
<td>Global variables and local variables</td>
</tr>
<tr>
<td>Algorithm by means of flowcharts or block diagrams</td>
</tr>
<tr>
<td>Parameters passing</td>
</tr>
</tbody>
</table>

38
D. Software Development

Programming

(ICT Vs Revised ALCS)

- Tree
- Recursion
D. Software Development

Programming Language

(ICT Vs CIT) Added

Language translators and compilers
D. Software Development

Systems Development

(ICT Vs Revised ALCS) Added

- The personnel
Thank you!