NSS Learning and Teaching Strategies for the ICT Curriculum Series: (4) Teaching Programming

新高中資訊及通訊科技課程學與教策略系列：（4）教授程式編寫

2:00pm	Registration
2:15pm	Introduction
2:30pm	'Basic Programming Concepts' of the Compulsory Part *Mr KWAN Chi-kuen (King Ling College)*
3:30pm	Break
3:45pm	'Software Development' of the Elective Part *Mr CHUNG Wai-keung (Po Leung Kuk Choi Kai Yau Memorial Secondary School)*
4:45pm	Support Measures
4:50pm	Question and Answer

資訊及通訊科技
Information and Communication Technology

Programming in Computer Subjects

Curriculum		Time Allocation
Computer Literacy (S1 – S3) *School may opt either Logo or any other computer language for teaching programming*		16 hours
CIT (S4 – S5)	**Core Module** **4. Basic Programming Concepts**	18 hours
	Elective Module **(A) Algorithm & Programming**	30 hours
NSS ICT (S4 – S6)	**Compulsory Part** **D. Basic Programming Concepts**	20 hours
	Elective Part **D. Software Development**	75 hours

ICT vs CIT

Compulsory part - **Basic Programming Concepts**

New learning elements in ICT

- Sub-programs or modules
- Design appropriate user interface
- Select appropriate data types and data structures
  (integer, real, character, Boolean, string and one-dimensional array)
- Boolean logic / truth tables
- Algorithm to load and print an array, add or delete an item from an array
- Identify boundary cases and generate test data

ICT vs CIT

Elective part – **Software Development**

New learning elements in ICT

- User-defined data types
- Construct lists, stacks and queues in terms of arrays
- Appraise the use of structured programming
- Numerical errors
- Programming paradigm involved in query language
- Define code generation, linkers and loaders
- Systems Development (16 hours)

ICT vs CIT

Elective part – **Software Development**

More clearly defined in ICT

- Algorithm
  (*searching – linear & binary; sorting – bubble, insertion, merge & quick*)
- Choose an appropriate algorithm
  (*complexities, data structure, efficiency, correctness, appropriateness*)
- Text file handling
  (*delete, insert, append and amend records*)
- Program debugging
  (*stubs, flags, break points, program traces*)

Statistic

Candidature of CIT Module A	Survey on schools offering ICT Option D
2005' - 23.9% 2006' - 22.2% 2007' - 20.6% 2008' - 18.6%	09/10' - 29%

Programming language used in CIT Module A:
C – 15% Pascal – 85%

Difficulties in Learning Programming

Compulsory part - **Basic Programming Concepts**

Candidates performance by Examiner' Report

- Lack of the experiences on flow-chart tracing
- Should strengthen their knowledge and skills in using flowchart

Other weaknesses observed by teachers

- Identify the objectives of an algorithm
- Amend / complete a given algorithm

Difficulties in Learning Programming

Elective part – **Software Development**

Candidates performance by Examiner' Report

- Showed a poor understanding in algorithm
- Showed a limited understanding of the operation in linked list
- Weak in calling procedure / function and handling parameters
- Showed limited experience of programming

'Basic Programming Concepts' of the Compulsory Part

Mr KWAN Chi-kuen
(King Ling College)

Break

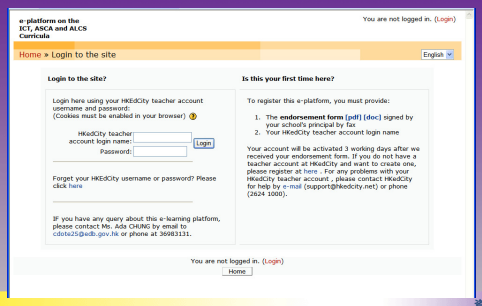
'Software Development' of the Elective Part

Mr CHUNG Wai-tung
(Pui Ching Middle School)

Support Measures

e-platform on the ICT, ASCA and ALCS Curricula

- http://sfcs.edb.hkedcity.net/



Learning &Teaching Resources

L&T Resource Packages for elective part

- Multimedia Production and Web Site Development
- Database Design Methodology and Systems Development
- Programming and Programming Languages
- Introduction to Databases, Relational Databases, Database Applications, Development and Society
- Data Communications and Networking

Professional Development Programme

PDP for Teaching Programming

29/06/2009 - Learning Programming Through Mobile Technology in Computer Subjects

Plan for 2009-2010 s.y.:

- Enriching Knowledge Series: Programming and Programming Languages
- Teaching Programming Through Mobile Technology in Computer Subjects
- Teaching Programming Through Game Design in Computer Subjects
- Teaching Programming in Junior Secondary Curriculum

Student Competition

Hong Kong Olympiad in Informatics (HKOI)

- an annual competition for secondary students on problem solving techniques and programming skills
- a preliminary contest to international, national and regional competitions such as NOI and IOI
- usually being held in October - December

Question and Answer

- Please return the completed evaluation form to us before you leave