


# Virtual Revision Conferences 2006 'In-house'

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## AS/A2 Computing For AQA students

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# AS Computing for AQA students

## Virtual Revision Conference (VR19)

with **Dr Derek Smith, Senior Examiner.**

The AS examinations test the underpinning knowledge and understanding of the operating characteristics of a computer and its software and applications. This series of presentations cover the required knowledge in 6 essential topic areas of the AQA AS qualification.

### **The Programme**

Each session includes teaching and workshop periods with handouts and lasts up to 50 minutes

#### **Session 1: Hardware and internal components of a Computer System**

The stored program concept is shown as an introduction the Von Neumann Machine. The main internal components and the buses forming the system bus to link the components are shown and discussed. Graphics and sound are explained at the level required by the specification. Typical examination questions are shown together with an approach that can be adopted to answer them correctly.

#### **Session 2: Information & Data Representation**

The difference between data and information will be explained. Number systems including binary, octal, hexadecimal and BCD will be explained using examples and typical examination questions. Coding schemes will be explained including the representation of graphics and sound. The difference between analogue and digital signals will be shown including a description of analogue to digital conversion

#### **Session 3: Programming languages and structures**

This presentation looks at the 3 generations of programming languages before covering the fundamentals of structured programming methodologies. Without referencing any particular programming language, the programming structures required for a structured approach will be shown.

#### **Session 4: Data Types and Algorithms**

The Abstract Data Types; binary trees, stacks and queues will be explained. Their uses will be demonstrated such as the use of a stack to reverse the elements of a queue. One and two-dimensional arrays will be explained. Typical AS level algorithms will be shown and approaches to hand tracing them discussed.

#### **Session 5: Database Concepts**

Database concepts such as data sharing and redundancy will be explained. The importance of keys and indexes will be shown and examples will be used to show the mechanism for linking related records. QBE will be explained and demonstrated

#### **Session 6: File Organisations**

With the emphasis on databases in ICT courses, questions requiring an understanding of files and their uses are often poorly answered. This presentation will show the difference between a file and a database structure. File and record structures will be discussed and the methods required to update and edit both sequential and direct access files explained

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#### **Dr Derek Smith**

**Dr Derek Smith has over 30 years experience of teaching ICT and Computing at all educational levels. Until 2005 he worked in an advisory or official role for the main A'level awarding body for Computing for 25 years, the last 10 years as Chair of Examiners. This position had responsibility for determining both the specification and standards of the current main A'level award.**

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## A2 Computing for AQA students Virtual Revision Conference (VR20)

with **Dr Derek Smith, Senior Examiner.**

The A2 specifications builds upon the basic knowledge and understanding from the AS units and applies these to the operation and use of modern computers. Many of these topics are complex and the detail can be confusing to an A level student. These 6 presentations cover the main areas, which are proving challenging and as such are vital for A level success. A mix of theory and examples demonstrate the depth necessary to access examination marks.

### **The Programme**

Each session includes teaching and workshop periods with handouts and lasts up to 50 minutes

#### **Session 1: Computer Architecture**

This presentation will discuss the Fetch-Execute cycle at the register level. The major components of a computer system will be explained and the influences of these on computer performance will be discussed. Finally the presentation will explain the importance of interrupts and how they are managed and implemented

#### **Session 2: Data Representation**

This presentation will cover data representation in computers including the differing number bases. Fixed and floating-point representation will be explained including that of negative numbers. Worked examples will be used liberally to illustrate the concepts.

#### **Session 3: Operating Systems**

This presentation will cover the different classifications of operating systems listed in the AQA unit 4 specification. Operating System concepts will be clearly explained to show how computer resources are effectively managed including that of process states and threads

#### **Session 4: Assembly language**

Assembly language questions usually gain the lowest marks in the AQA CPT4 examination. Using a mixture of theory and coded examples, the nature and format of assembly language statements will be explained. No specific assembly language will be used but practical examples and examination answers will use the structures and formats employed in recent examinations.

#### **Session 5: Object Oriented Programming**

The AS specification requires an understanding of a structured approach to programming design. The A2 specification moves this onto an understanding of the Object Oriented Approach. This presentation will look at the advantages of this approach, the fundamentals of the methodology, typical language structures and how to answer the type of questions being asked in the AQA CPT4 examination.

#### **Session 6: Networking**

Networking was a major topic update with the current specification. Continuous advances in hardware and operating systems has emphasized the importance of this topic. This presentation will cover the unit 5 content and show how networks operate, and interconnected using hardware such as bridges and routers, and their connections to the Internet.

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