Computer Science students visiting Bletchley Park

We run two extra-curricular sessions:

Code & Cake Club
This is for anyone that needs a little extra support with their college work, or for anyone to create small projects in groups. We have Raspberry Pis, Micro-bits, robotic arms, motors, lights and switches. These projects look great on a personal statement when applying to university.

Web Developer Club
Run in conjunction with a local professional website developer, we are working in groups to develop websites that make use of the location feature on your smartphone, with other project ideas in the pipeline for the future.

Is Computer Science for you?

Are you interested in understanding how computers work? Do you want to know how computers and computer systems are constructed? Would you like to learn how to write computer programs to control what a computer does? Are you interested in how humans think, and how we can represent that using computers? Do you enjoy solving problems and puzzles? If yes, then Computer Science may be a suitable subject for you to study.

Check out these websites to find out more about Computer Science:

http://student.craigndave.org/a-level-videos (Video tutorials for course)
http://tinyurl.com/OCRComputerScience (OCR GCE Computer Science)
https://www.youtube.com/user/Computerphile (Computer Science videos for interest)

For more information
Please contact: Programme Leader Tim Bowry, twb@varndean.ac.uk

Computer Science

What is Computer Science?

Computers figure in so many different fields: science, technology, medicine, research, manufacturing, media and communications. The subject of computer science gets on the inside of the most powerful tool in the modern age. It is the study of the inner workings of computer systems, their construction and programming.

This computer science course gives you a foundation in computing and computer systems. You will develop your problem solving skills, learn practical skills to create computer programs and gain an understanding of hardware and software aspects of computer systems. More advanced topics include operating systems, communications and networking and the Internet. The course also develops your understanding of the broader social and legal issues related to computer technologies.

What is the OCR A Level course content?

- Programming – C#, Object-Orientated, SQL, HTML & CSS, Assembly Lanugage
- Programming techniques - Sequence, Selection, Iteration, Recursion, Local/Global variables, Functions/Procedures, IDE, OO techniques
- Data structures – arrays, lists, linked-lists, hash tables, stacks, queues, trees, graphic records
- Algorithms – Search, Sort, Tree/Graph traversals, Shortest-path, Big O notation to compare algorithm efficiency
- Data Representation - Binary integers, two's complement, floating point binary numbers, hexadecimal, encryption
- Boolean Logic - Logic gates, Boolean Algebra, Simplifying rules, Karnaugh maps, Half/Full Adders, Flip-Flops
- Computer architecture – CPU, GPU, RAM, ROM, Secondary Storage, internal and external components, Machine code
- Ethical and Legal issues of Computers – Data Protection Act, Computer Misuse Act
- Networking – Network Topologies, devices, The Internet, Wired vs Wireless data transfer, TCP/IP, CRUD and REST, Security issues, DNS
- Web technologies – Search engine indexing, PageRank algorithm, Server/Client side processing
- Databases – Flat file vs relational databases, Key terms, ER modelling, Normalisation, SQL, DBMS, ACID rules
- Big Data – Volume/ Velocity / Variety
- The Computing Practical Project

How is the OCR course assessed?

Paper 1	40% of A Level	Paper exam 2½ hours - 140 marks
Paper 2	40% of A Level	Paper exam 2½ hours - 140 marks
Project	20% of A Level	Coursework - 6 months

What are the entry requirements?

The entry requirements for this subject are as for all advanced courses, including Grade 4 in English and Grade 6 in Maths at GCSE. Experience of programming (in any language), GCSE Computer Science or equivalent is preferred. You should have an interest in the subject and an aptitude for problem solving.

What are the course expectations?

Approximately 2 hours of homework will be set weekly to support the theoretical and practical work covered in lessons. Students will be expected to meet all deadlines and keep a well-organised file of notes. Where homework requires use of a computer, students may work in the college open access facilities or at home. In order to develop a broad understanding of the subject, students are encouraged to read periodicals and listen to tech podcasts.

Where does it lead?

Computer Science A Level leads on to degree courses in computer science, computer software engineering, computer networking, artificial intelligence, robotics, game design, forensic computing, cyber security, data analyst and many more.

There are many IT level 4 (degree level) paid apprenticeships on offer now. Visit www.notgoingtouni.co.uk for current vacancies