

Computing at School Regional Centre (CAS South East)

Mathematics and Science Learning Centre

Subject Specialism Training – Computing 2016_17

Dates
Mon 10 th October 2016
Tuesday 24 th January 2017
Friday 3 rd March 2017
Wednesday 5 th April 2017
Thursday 22 nd June 2017

In these five days, we will focus on the skills most commonly needed for ICT practitioners wishing to deliver computing to GCSE level. We will initially look at computational thinking and how we can teach this transferable problem solving skill to students. We will then look at programming concepts and use computational thinking to solve problems and use these problems as a means to learn scratch and python.

The python skills are aimed at those who have never programmed before and should take you up to the level required for GCSE by the end of the course. The non-programming theory units will be focused on the theory paper faced by GCSE students aimed at giving the necessary background knowledge to confidently deliver the topics to a range of students.

Note that content will be adapted to meet the needs of the group.

Tutor: Tig Williams

Following a career in industry, Tig became an experienced teacher of computing and now works for CAS South East. Tig has delivered a range of professional development programmes, including for Computing at School, subject specialism programmes and generic CPD.

	Content	Outcomes
Day 1	<ul style="list-style-type: none"> Computational thinking & troubleshooting. Systems analysis / abstraction. Applying abstraction to real world problems. Choice of Algorithms and the effect on systems. Planning algorithms using pseudocode and flowcharts. Practical application of solutions using scratch. 	<ul style="list-style-type: none"> Participants should understand computational thinking. Be able to use computational thinking to decompose a problem. Be able to take a decomposed problem and map a solution using various techniques. Practice/learn basic scratch skills and take away teaching resources for scratch.



	Content	Outcomes
Day 2	<ul style="list-style-type: none"> • Introduction to Python (KS3). <ul style="list-style-type: none"> ○ Input ○ Output ○ Loops (While, For) ○ Selection (If) ○ Arrays 	<ul style="list-style-type: none"> • Learn enough python to be able to confidently deliver it to KS3 in context. • Take away a 6 hours KS3 unit of work that can be delivered.
Day 3	<ul style="list-style-type: none"> • Python for KS4 <ul style="list-style-type: none"> ○ File handling. ○ Databases using Python. ○ Solution of GCSE Computing coursework problems. 	<ul style="list-style-type: none"> • Enhance KS3 skills to GCSE level. • Be confident creating and working with files in python. • Be able to create and work with a simple database in python. • Gain experience of solving KS4 coursework programming problems.
Day 4	<ul style="list-style-type: none"> • Binary and binary maths. • Conversion between Binary, Denary, Octal and Hex • Logic gates. • Truth tables. • Constructing truth tables from logic diagrams and vice versa. 	<ul style="list-style-type: none"> • Learn to manipulate the common number bases used in computing. • Be able to practise the maths using the various bases and take away resources to help teach • Be able to work with logic gates and truth tables to GCE level.
Day 5	<ul style="list-style-type: none"> • Hardware components. • Networking (becoming familiar with topologies). • TCP/IP and other protocols (SMTP, FTP, POP, HTTP, IMAP). • Internet vs Web. Look at the difference between then and understand why they are commonly mixed up. • Fetch / Execute cycle. • Basic look at client / Server model. 	<ul style="list-style-type: none"> • Understand the components of the computer. • Understand the basic structure of the TCP/IP protocol. • Understand what a protocol is and what functions the main protocols perform. • Gain a basic understanding of the fetch execute cycle and take a teaching resource away to demonstrate it.

Optional Additional Days

1. Visit to the University of Southampton Data centre where participants will tour servers and research machines and gain an understanding of the process plant and redundancy required to maintain a server farm.
2. GCSE computing coursework where the group will discuss and solve issues and troubleshoot marking issues.

Apply

To apply for this course, visit our expression of interest - www.isurvey.soton.ac.uk/19835

Further information

Please email mslc@soton.ac.uk with and further queries.

