

DAGENHAM PARK SUBJECT CURRICULUM

Subject	Computer Science
Year Group	Year 12 & Year 13
Overview	<p>Exam Board – OCR</p> <p>Overview – A Level Computer Science will give you an insight into how the world around us has been shaped by computers and the Internet as well as how our world continues to evolve.</p> <p>There are three modules that make up this qualification: Module 1 – Computer Systems includes the following topics:</p> <ul style="list-style-type: none"> - Components of a computer and their uses - Types of software and the different methodologies used to develop software - How data is exchanged between different systems - How data is represented and stored within different structures, different algorithms that can be applied to these structures - The individual moral, social, ethical and cultural opportunities and risks of digital technology - Legislation surrounding the use of computers and ethical issues that can or may in the future arise from the use of computers <p>Module 2 – Algorithms and programming includes the following topics:</p> <ul style="list-style-type: none"> - Understand what is meant by computational thinking - How computers can be used to solve problems and programs can be written to solve them - The use of algorithms to describe problems and standard algorithms - <p>Module 3 – Programming project which is made up of the following sections:</p> <ul style="list-style-type: none"> - Analysis of the problem - Design of the solution - Developing the solution - Evaluation <p>Unit Assessment –</p> <p>Computer Systems (01) – 140 Marks – 2 hours & 30 minutes – written paper – 40% of total A level</p> <p>Algorithms and programming (02) – 140 Marks – 2 hours & 30 minutes – written paper – 40% of total A level</p> <ul style="list-style-type: none"> - Programming project (03) – 70 marks – non-examined assessment – 20% of total A level

Autumn Half term 1	Year 12	Year 13
	Programming introduction and recap Computer architecture The CPU Input & Output devices Data Storage	Categories of software Assembly languages Databases SQL Transaction processing and ACID HTML & CSS Javascript
Autumn Half term 2	Year 12	Year 13
	Systems software Software development Algorithms Procedural and Object Orientated languages Assembly languages Databases Computer networks	Search engine indexing Cloud computing Web applications Floating point numbers Character sets Arrays, tuples & records Lists and linked lists Stacks and Queues Graphs and Trees Hash tables Karnaugh maps
Spring Half term 1	Year 12	Year 13
	Internet technologies Binary Hexadecimal Floating point numbers Computer related legislation Moral & Ethical issues	Adders and flip flops Evaluation and design of algorithms Compression and hashing De Morgans Law Translators
Spring Half term 2	Year 12	Year 13
	Computational thinking Functions and procedures IDEs Searching algorithms Sorting algorithms File and exception handling Computational methods	Programming project Revision
Summer Half term 1	Year 12	Year 13
	Compression Encryption Hashing Database design HTML and CSS Javascript	Revision & Exams
Summer Half term 2	Year 12	Year 13
	Programming project dedicated time	

Homework	Pupils will be set flipped learning videos to watch and make notes on each week before their lessons
Useful Resources	<ul style="list-style-type: none">- Craig'n'Dave on youtube- Linear and Nonlinear Programming – David G. Luenberger, Yinyu Ye- Modelling Computing Systems – Faron Moller, Georg Struth- Computational Fairy Tales – Jeremy Kubica- Life 3.0: Being Human in the Age of Artificial Intelligence – Max Tegmark- Code: The Hidden Language of Computer Hardware and Software – Charles Petzold- Out of Their Minds – D Shasha and Cathy Lazere- Outnumbered: From Facebook and Google to fake news and filter-bubbles – the algorithms that control our lives – David Sumpter- CS4FN (Computer Science for Fun)- Projecteuler.net- The GCHQ puzzle book