

# Computer Science



**Lead Teacher: Mr N. Kakou**

**Year 7**

Computing and computer technology are part of just about everything that touches our lives from the cars we drive, to the movies we watch, to the ways businesses and governments deal with us. Understanding different dimensions of computing is part of the necessary skill set for an educated person in the 21st century. Whether one wants to be a scientist, develop the latest killer application, or just know what it really means when someone says 'the computer made a mistake', studying computing will provide you with valuable knowledge. Computing requires and develops capabilities in solving deep, multidimensional problems requiring imagination and sensitivity to a variety of concerns.

Year 7	Autumn 1	Autumn 2
<b>Focus/Context for Learning</b>	<b>Using-computers-safely effectively-and responsibly</b> <ul style="list-style-type: none"> <li>L1 File management</li> <li>L2 Social networking</li> <li>L3 Keeping your data safe</li> </ul>	<b>A. Understanding computers</b> <ul style="list-style-type: none"> <li>L1 Elements of a Computer</li> <li>L2 The CPU</li> <li>L3 Understanding Binary</li> </ul>
	Spring 1	Spring 2
<b>Focus/Context for Learning</b>	<b>B. Understanding computers</b> <ul style="list-style-type: none"> <li>L4 Binary Addition</li> <li>L5 Storage Devices</li> </ul>	<b>Networks</b> <ul style="list-style-type: none"> <li>L1 The Internet</li> <li>L2 Connectivity L3 Topologies</li> <li>L4 Client-server networks</li> <li>L5 Encryption</li> </ul>
	Summer 1	Summer 2
<b>Focus/Context for Learning</b>	<b>A. Introduction to Python</b> <ul style="list-style-type: none"> <li>L1 Introducing Python</li> <li>L2 Numbers and Arithmetic</li> <li>L3 Input</li> </ul>	<b>B. Introduction to Python</b> <ul style="list-style-type: none"> <li>L4 Selection</li> <li>L5 Programming Project 1</li> </ul>

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**Year 8**

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Year 8	Autumn 1	Autumn 2
<b>Focus/Context for Learning</b>	<b>Introduction to Python (2) /Flowchart</b> <ul style="list-style-type: none"> <li>• L1 Selection</li> <li>• L2 Writing algorithms</li> <li>• L3 While loops</li> <li>• L4 Programming project</li> </ul>	<b>Algorithms</b> <p><b>A- Computational Thinking</b></p> <ul style="list-style-type: none"> <li>• L1 Abstraction</li> <li>• L2 Decomposition</li> </ul> <p><b>B. Searching algorithms</b></p> <p><b>C. Sorting algorithms</b></p>
	Spring 1	Spring 2
<b>Focus/Context for Learning</b>	<b>Data representation</b> <ul style="list-style-type: none"> <li>• L1 Storage units and binary</li> <li>• L2 Binary arithmetic and Hexadecimal</li> <li>• L3 Characters</li> <li>• L4 Images</li> <li>• L5 Sounds</li> </ul>	<b>Boolean Logic</b> <ul style="list-style-type: none"> <li>• L1 AND Gate</li> <li>• L2 OR Gate</li> <li>• L3 NOT Gate</li> </ul>
	Summer 1	Summer 2
<b>Focus/Context for Learning</b>	<b>Systems software</b> <ul style="list-style-type: none"> <li>• L1 Operating system software</li> <li>• L2 Utility software</li> </ul>	<b>HTML</b> <ul style="list-style-type: none"> <li>• L1 HTML</li> <li>• L2 CSS</li> <li>• L3 Design</li> </ul> <p><b>Project 2</b></p>

# Computer Science



**Lead Teacher: Mr N. Kakou**

**Year 9**

Computing and computer technology are part of just about everything that touches our lives from the cars we drive, to the movies we watch, to the ways businesses and governments deal with us. Understanding different dimensions of computing is part of the necessary skill set for an educated person in the 21st century. Whether one wants to be a scientist, develop the latest killer application, or just know what it really means when someone says 'the computer made a mistake', studying computing will provide you with valuable knowledge. Computing requires and develops capabilities in solving deep, multidimensional problems requiring imagination and sensitivity to a variety of concerns.

Year 9	Autumn 1	Autumn 2
<b>Focus/Context for Learning</b>	<b>HTML</b> L1 Development L2 Creating a web form	<b>HTML</b> <b>Project 3:</b> Develop a website that contains a minimum of five pages. The website must contain an appropriate navigation system and a consistent look across all pages. It should also contain a range of images, appropriate text, and any other multimedia assets.
<b>Focus/Context for Learning</b>	<b>Spring 1</b> <b>Digital Animation</b> <ul style="list-style-type: none"><li>· L1 Frame-by-frame animation</li><li>· L2 Motion tweening</li><li>· L3 Text, buttons and ActionScript</li><li>· L4 Planning an animation</li></ul>	<b>Spring 2</b> <b>Digital Animation</b> <b>Project 4:</b> Create an animation to promote Healthy Living. The charity requesting the animation has asked for it to be 30 seconds or more. The animation should have visual and audio aides including movement of characters, sound effects and environmental sounds that match the background.
<b>Focus/Context for Learning</b>	<b>Summer 1</b> <b>Systems architecture</b> A. CPU <ul style="list-style-type: none"><li>· L1 The CPU</li><li>· L2 Function and characteristics of the CPU</li></ul>	<b>Summer 2</b> <b>Systems architecture</b> B. Memory & Storage <ul style="list-style-type: none"><li>· L1 Memory</li><li>· L2 Storage</li></ul>

# Computer Science



## Lead Teacher: Mr N. Kakou

## Year 10

Computing and computer technology are part of just about everything that touches our lives from the cars we drive, to the movies we watch, to the ways businesses and governments deal with us. Understanding different dimensions of computing is part of the necessary skill set for an educated person in the 21st century. Whether one wants to be a scientist, develop the latest killer application, or just know what it really means when someone says 'the computer made a mistake', studying computing will provide you with valuable knowledge. Computing requires and develops capabilities in solving deep, multidimensional problems requiring imagination and sensitivity to a variety of concerns. Computing:

- Enables you to make a positive difference in the world.
- Computing offers many types of lucrative careers.
- Computing jobs are here to stay, regardless of where you are located.
- Expertise in computing helps even if your primary career is something else.
- Computing offers great opportunities for true creativity and innovativeness.
- Computing has space for both collaborative work and individual effort.
- Computing is an essential part of well-rounded academic preparation.
- Future opportunities in computing are without boundaries.

Year 10	Autumn 1	Autumn 2
<b>Focus/Context for Learning</b>	A Algorithms <ul style="list-style-type: none"> <li>• L1 Computational Thinking</li> <li>• L2 Searching Algorithms</li> <li>• L3 Sorting Algorithms</li> </ul> B. Programming techniques (Python)	A. Algorithms <ul style="list-style-type: none"> <li>• L4 Pseudocode</li> <li>• L5 Flowchart</li> <li>• L6 Interpret, correct or complete algorithms</li> </ul> B. Programming techniques (Python)

	Spring 1	Spring 2
<b>Focus/Context for Learning</b>	A. Programming <ul style="list-style-type: none"> <li>• L1 Programming Concepts</li> <li>• L2 Sequence and selection</li> <li>• L3 Iteration</li> <li>• L4 Arrays</li> </ul> B. Python Programming <ul style="list-style-type: none"> <li>• Producing robust programs</li> </ul>	A. Programming <ul style="list-style-type: none"> <li>• L4 Procedures and functions</li> <li>• L5 Records and files</li> <li>• L6 Introduction to SQL</li> </ul> B. Python Programming <ul style="list-style-type: none"> <li>• Producing robust programs</li> </ul>

	Summer 1	Summer 2
<b>Focus/Context for Learning</b>	A. Logic and languages <ul style="list-style-type: none"> <li>• L1 Logic diagrams and truth tables</li> <li>• L2 Defensive design</li> <li>• L3 Errors and testing</li> <li>• L4 Translators and facilities of languages</li> </ul> B. Python Programming <ul style="list-style-type: none"> <li>• Producing robust programs</li> </ul>	A. Programming Project B, Exam Styled Programming Challenges C. Past Papers: Exam Styled Questions

# Computer Science



## Lead Teacher: Mr N. Kakou

Year 11

Computing and computer technology are part of just about everything that touches our lives from the cars we drive, to the movies we watch, to the ways businesses and governments deal with us. Understanding different dimensions of computing is part of the necessary skill set for an educated person in the 21st century. Studying computing will provide you with valuable knowledge. Computing requires and develops capabilities in solving deep, multidimensional problems requiring imagination and sensitivity to a variety of concerns.

Year 11	Autumn 1	Autumn 2
<b>Focus/Context for Learning</b>	A. Revision 1 <ul style="list-style-type: none"> <li>Systems architecture</li> <li>Memory &amp; storage</li> <li>Storage Units &amp; Binary</li> <li>Binary</li> <li>Binary arithmetic</li> <li>Hexadecimal</li> <li>ASCII and Unicode</li> <li>Images, Sound and Compression</li> </ul> B. Past Papers - Programming Project (Python)	A. Revision 2 <ul style="list-style-type: none"> <li>Wired and wireless networks</li> <li>Network topologies</li> <li>protocols and layers</li> <li>System security</li> <li>Systems software</li> </ul> B. Past Papers - Programming Project (Python)

	Spring 1	Spring 2
<b>Focus/Context for Learning</b>	A. Revision 3 <ul style="list-style-type: none"> <li>Ethical, legal, cultural and environmental concerns</li> <li>Computational Thinking</li> <li>Searching Algorithms</li> <li>Sorting Algorithms</li> </ul> B. Past papers - Programming Project (Python) <ul style="list-style-type: none"> <li>Producing robust programs</li> </ul>	A. Revision 4 <ul style="list-style-type: none"> <li>Programming Concepts</li> <li>Sequence and selection</li> <li>Iteration</li> <li>Arrays</li> <li>Procedures and functions</li> <li>Records and files</li> <li>Introduction to SQL</li> </ul> B. Past papers - Programming Project (Python) <ul style="list-style-type: none"> <li>Producing robust programs</li> </ul>

	Summer 1	Summer 2
<b>Focus/Context for Learning</b>	A. Revision 5 <ul style="list-style-type: none"> <li>Logic diagrams and truth tables</li> <li>Defensive design</li> <li>Errors and testing</li> <li>Translators and facilities of languages</li> </ul> B. Past papers - Programming Project (Python)	A. Exam Styled Programming Challenges B. Exam Styled Questions

# Computer Science



Year 12

## Lead Teacher: Mr N. Kakou

Computing and computer technology are part of just about everything that touches our lives from the cars we drive, to the movies we watch, to the ways businesses and governments deal with us. Understanding different dimensions of computing is part of the necessary skill set for an educated person in the 21st century. Studying computing will provide you with valuable knowledge. Computing requires and develops capabilities in solving deep, multidimensional problems requiring imagination and sensitivity to a variety of concerns.

The aims of this qualification are to enable learners to develop:

- An understanding and ability to apply the fundamental principles and concepts of computer science
- The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so
- The capacity to think creatively, innovatively, analytically, logically and critically

Year 12	Autumn 1	Autumn 2
<b>Focus/Context for Learning</b>	<b>Components of a computer</b> <ul style="list-style-type: none"> <li>• Processor components</li> <li>• Processor performance</li> <li>• Types of processor</li> <li>• Input, Output &amp; Storages devices</li> </ul> <b>Programming (Python)</b>	<b>Systems Software</b> <ul style="list-style-type: none"> <li>• OS functions</li> <li>• Types of OS</li> <li>• Nature of applications</li> <li>• Programming language translators</li> </ul> <b>Programming (Python)</b>
<b>Focus/Context for Learning</b>	<b>Spring 1</b> <b>Software development</b> <ul style="list-style-type: none"> <li>• Systems analysis methods</li> <li>• Writing and following algorithms</li> <li>• Programming paradigms</li> <li>• Assembly language</li> </ul> <b>Programming (Python)</b>	<b>Spring 2</b> <b>Exchanging data</b> <ul style="list-style-type: none"> <li>• Compression and encryption</li> <li>• Database concepts</li> <li>• Relational databases and normalisation</li> <li>• Introduction to SQL</li> <li>• Defining and updating tables using SQL</li> <li>• Transaction processing</li> </ul> <b>Programming (Python)</b>
<b>Focus/Context for Learning</b>	<b>Summer 1</b> <b>Networks</b> <ul style="list-style-type: none"> <li>• Structure of the Internet</li> <li>• Internet communication</li> <li>• Network security and threats</li> <li>• HTML and CSS</li> <li>• JavaScript</li> <li>• Search engine indexing</li> <li>• Client-server and peer-to-peer</li> </ul> <b>Programming (Python)</b>	<b>Summer 2</b> <b>Data types</b> <ul style="list-style-type: none"> <li>• Data types, binary and hexadecimal</li> <li>• ASCII and Unicode</li> <li>• Binary arithmetic</li> <li>• Floating point arithmetic</li> <li>• Bitwise manipulation and masks</li> </ul> <b>Programming (Python)</b>