

St John's Senior School



Subject: Computer Science
Teacher: Evan Zampekos

Form: 6th Lower
Term: Autumn

WEEK	WEEK BEGINNING	TOPIC
1	6 th September	Algorithms and programs: Introduction-Flowcharts-Pseudocode. Variables and constants, Identifiers, Mathematical operations (including DIV and MOD), Logical operations
2	13 th September	Algorithms and programs: Introduction to python and IDLE Programming constructs
3	20 th September	Algorithms and programs: Application of concepts, operations and simple data constructs to complete simple programs and develop the confidence to experiment. Practical experience of programming
4	27 th September	Algorithms and programs: Modular programming, Scope of variables, Parameters. Data structures. Progression to a wider range of program tasks, including 1- and 2-dimensional arrays.
5	4 th October	Algorithms and programs: Searching and sorting algorithms. Practical experience of programming. Progression to a wider range of program tasks, including 1- and 2-dimensional arrays
6	11 th October	MINI TEST WEEK
7	18 th October	Data structures: Describe, interpret and manipulate data structures including arrays (up to three dimensions), records, stacks, queues, trees, linked lists and hash tables. Select, identify and justify appropriate data structures for given situations.
HALF - TERM		
9	1 st November	Algorithms and programs: Compression algorithms. Testing algorithms. Practical experience of programming
10	8 th November	Logical operations: Draw truth tables for Boolean expressions consisting of AND, OR, NOT, XOR, NAND and NOR logical operations. Apply logical operations to combinations of conditions in programming, including clearing registers, masking, and encryption

11	15 th November	<p>Algorithms and programs: Explain the use of recursion in algorithms and programs and consider the potential elegance of this approach</p>
12	22 nd November	<p>Algorithms and programs: Sorting: Explain the need for a variety of sorting algorithms both recursive and non-recursive.</p>
13	29 th December	<p>Algorithms and programs: Explain the effect of storage space required, number of comparisons of data items, number of exchanges needed and number of passes through the data on the efficiency of a sorting algorithm. Use Big O notation to determine the efficiency of different sorting algorithms in terms of their time and space requirements and to compare the efficiency of different sorting algorithms.</p>
14	6 th December	<p>Algorithms and programs: Searching: Explain and apply a shortest-path algorithm. Describe appropriate circumstances for the use of each searching technique. Use Big O notation to determine the efficiency of linear and binary searches in terms of execution time and space requirements and to compare the efficiency of different searching algorithms.</p>

St John's Senior School



Subject: Computer Science
Teacher: Evan Zampekos

Form: 6th Lower
Term: Spring

WEEK	WEEK BEGINNING	TOPIC
1	4 th January	MOCK EXAMS (5th and 6th forms)
2	10 th January	Algorithms and programs: Compression algorithms. Testing algorithms. Practical experience of programming
3	17 th January	Algorithms and programs: Traversal of data structures: Write and interpret algorithms used in the traversal of data structures
4	24 th January	Software engineering: Software tools. Practical experience of programming
5	31 st January	Data representation and data types: Representation of data as bit patterns
6	7 th February	Data representation and data types: Storage of characters. Data types.
HALF - TERM		
7	21 st February	Data representation and data types: Representation of numbers as bit patterns
8	28 th February	Design files and records appropriate for a particular application. Organisation and structure of data: Explain the purpose of files in data processing. Define a file in terms of records and fields. Describe how files may be created, organised, updated and processed by programs.
9	7 th March	Database systems.

10	14 th March	Hardware and communication: Architecture
11	21 st March	Hardware and communication: Fetch-execute cycle
12	28 th March	Hardware and communication: Input / output. Secondary storage. Data storage on disc.

St John's Senior School



Subject: Computer Science
Teacher: Evan Zampekos

Form: 6th Lower
Term: Summer

WEEK	WEEK BEGINNING	TOPIC
1	25 th April	Hardware and communication: Networking. Internet. Data transmission: Types and techniques. Communication networks.
2	2 nd May	The operating system. Principles of programming.
3	9 th May	Principles of programming. Program construction.
4	16 th May	Systems analysis.
5	23 rd May	The need for different types of software systems and their attributes.
HALF - TERM		
7	6 th June	Algorithms and programs: Comparing algorithms: Use Big O notation to determine the complexity and efficiency of given algorithms in terms of their execution time, their memory requirements and between algorithms that perform the same task.
8	13 th June	END OF TERM EXAMS (1st form)
9	20 th June	END OF TERM EXAMS (2nd, 3rd, 4th forms)
10	27 th June	Principles of programming: Explain the nature and relative advantages of different programming paradigms and identify possible situations where they may be used. Describe the distinguishing features of different types of programming paradigms, including procedural, event- driven, visual and mark-up languages.
11	4 th July	Principles of programming: Describe the role of an object-oriented approach to programming and the relationship between object, class and method.