

Computer Science Curriculum Overview – Year 11

Sequencing of topics	What knowledge will students develop? (Including key terminology)	What skills will students develop? (Including literacy & numeracy)	Assessment opportunities	Homework opportunities	Personal development (Ursuline Values, Catholic Social Teaching, Cultural Capital, Cross-curricular, Careers)	Curriculum links (K4 Program of Study)
Autumn Term 1						
<p>Computational logic</p> <p>Searching and sorting algorithms</p>	<ul style="list-style-type: none"> • Basic Logic Gates and Truth Tables • AND OR NOT GATES • Logic circuits: two or more logic gates connected together • Solving problems using logic circuits • Sorting algorithms: Bubble, insertion and merge sorts • Searching algorithms: Binary and linear searches 	<p>Students will learn how to identify logic gates, draw logic symbols and complete truth tables for logic circuits. They will be able to complete logic problems and draw their own logic circuits to solve problems.</p> <p>Students learn how to perform the 2 search algorithms and 3 sort algorithms on a selection of numeric and alpha numeric data. Students can explain the advantages and disadvantages of using different sorting and searching algorithms.</p>	<p>Use of exam questions in class</p> <p>Practical searching and sorting activities</p> <ul style="list-style-type: none"> • Mid-topic assessments • Topic questions set online using ISAAC computer Science • Use of questioning in class 	<p>Questions set on ISAAC Computer Science on this topic</p>	<p>Grateful for the gifts that modern technology has given to us.</p> <p>Listening and attentive to technical information</p> <p>Courageous and resilient when overcoming problems.</p> <p>Links to careers in Electrical Engineering</p> <p>Links to Mathematics</p>	<p>2.4.1 Boolean logic</p> <p>2.1.3 Searching and sorting algorithms</p>
Autumn Term 2						

<p>Languages, translators and IDEs</p> <p>Producing Robust Programs</p>	<p>Features of High and Low level languages: Machine code, assembly ,high level</p> <p>The need to translate source code into machine code: Translators: Interpreters and Compilers</p> <p>The Features of IDEs: run time environment and diagnostics</p> <p>Code maintainability: comments, functionalisation and variable names</p> <p>Defensive design: Anticipating misuse through the use of validation and input sanitisation.</p> <p>Two factor authentication</p> <p>Iterative and final testing</p> <p>Exam Revision</p>	<p>Students learn how different generations of languages differ from each other.</p> <p>Students can identify different generations of languages.</p> <p>Students learn the need to translate code into machine code and the different types of translators:interpreters and compilers.</p> <p>Students can identify the features of IDEs and how they help programmers.</p> <p>Students learn the importance of defensive design in dealing with input errors.</p> <p>They can identify different types of validation checks</p> <p>Students can identify and complete test plans using different examples of test data.</p>	<ul style="list-style-type: none"> • Mid-topic assessments • Use of questioning in class • Topic questions set online using ISAAC computer Science • Year 11 mock exam in December 	<p>Questions set on ISAAC Computer Science on this topic</p>	<p>Grateful for the gifts that modern technology has given to us.</p> <p>Listening and attentive to technical information</p> <p>Courageous and resilient when overcoming problems.</p> <p>Links to careers in Systems Analysis and Design</p> <p>Opportunities to introduce students to the development of computer languages from machine code to early high level languages such as Fortran</p>	<p>2.5.1 Languages</p> <p>2.5.2 The Integrated Development Environment (IDE)</p> <p>2.3.1 Defensive design</p> <p>2.3.2 Testing</p>
---	---	---	--	--	--	---

Spring Term 1

<p>SQL:</p>	<p>Introduction to SQL: Tables, Records, Fields, primary and foreign keys</p> <p>SQL Queries: SELECT FROM WHERE</p>	<p>Students learn how SQL is used to interrogate data sets.</p>	<ul style="list-style-type: none"> • Mid-topic assessments 	<p>Questions set on ISAAC Computer Science on this topic</p>	<p>Listening and attentive to</p> <p>Courageous and resilient when overcoming problems.</p>	<p>2.2.3 Additional programming techniques</p>
-------------	---	---	---	--	---	--

	<p>The use of mathematical and Boolean Operators in queries: AND OR NOT, >,<>=</p> <p>Practical Programming Project in SQL.</p>	<p>Students can identify primary and foreign keys in tables</p> <p>Students can write a simple SQL query and predict the results.</p> <p>Students can write complex queries using Boolean operators and mathematical operators Students create a simple SQL schema on SQL fiddle and use it for practical activities such as sorting and searching</p>	<ul style="list-style-type: none"> • Use of questioning in class • Completion of exam questions • SQL practical programming project 		<p>Links to careers in Database and Website design and development</p>	
--	--	--	--	--	--	--

Spring Term 2

Practical Programming Skills Revision	Practical programming activities.		<p>Use of questioning in class</p> <ul style="list-style-type: none"> • 		<p>Grateful for the gifts that modern technology has given to us.</p> <p>Listening and attentive to technical information</p> <p>Courageous and resilient when overcoming problems.</p> <p>Links to careers in Programming</p>	<p>2.1.2 Designing, creating and refining algorithms</p> <p>2.2.2 Data types</p> <p>2.2.3 Additional programming techniques</p>
---------------------------------------	-----------------------------------	--	--	--	--	---

Summer Term 1

Preparation for Exam	<ul style="list-style-type: none"> • Revision for paper 1 and paper 2 Practical programming skills rev 	Using past papers and mark schemes students prepare for paper 1 and paper 2	<ul style="list-style-type: none"> • Final exams 	Questions set on ISAAC Computer Science on this topic	<p>Listening and attentive to the technical information shared in class</p>	
----------------------	--	---	---	---	---	--

				Questions from past papers	Courageous and resilient when preparing for final exams	
--	--	--	--	----------------------------	---	--