

Computer Science – Higher Level

In Computer Science HL, students will study computer hardware and Boolean Logic/Algebra, computer programming through graphics, and general computer programming techniques in Java, which includes the study of records/structures for storing data, dynamic data structures, file handling, binary trees, combined with binary search and direct file access techniques through the creation of large-scale computer programs.

Throughout this course, students will explore the world of Object Oriented Programming through the study of case study programs of varying sizes, and will have the opportunity to expand upon and further develop large-scale programs. Other units of study include the inner working of the CPU and the machine cycle, infix/postfix/prefix notation, stacks, queues, and circularly linked lists, hashing, the system life cycle, networking, and the impact of technology on society. Please note that the primary focus of this course is computer programming in Java and problem solving using algorithms.

Subject Areas

1. **Systems life cycle and software development** – analysis, design, life cycle of software, social significance and implications of computer systems
2. **Program construction in Java** – large and small-scale program design
3. **Computer system fundamentals** – language translators, system architecture, computer systems, networks, storage and data representation
4. **Computer mathematics and logic** – number systems and representation, Boolean logic/algebra
5. **Abstract data structures and algorithms** – fundamentals, recursion, static and dynamic data structures and algorithms
6. **Further system Fundamentals** – processor configuration, magnetic disk storage
7. **File organization**

Assessment

Internal	Program Dossier	One in depth project addressing a single problem	35%
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In Computer Science HL, students will complete a large, fully documented programming project that solves a practical real-world problem, which will be internally assessed and sent to the IBO for moderation (Program Dossier). This project will be completed in the second year of the course, and highlights various programming concepts and techniques that have been learnt throughout the course. Students will be encouraged to find a real-world problem that can be solved through the creation of a customized computer program, which is then designed and implemented.

External	Paper 1	2 ¼ hrs – a two section paper – several short answer questions and six structured questions	32.5%
	Paper 2	2 ¼ hrs – involves four questions – three extended response questions and one structured questions	32.5%