IBDP Computer Science Year 1 (HL/SL) Grade 11 – IBDP Group 4

Prerequisite: Graphics Programming or equivalent knowledge or instructor's permission

Audience : This is an excellent course for students intending to pursue technical or semi-technical careers – business, science, engineering, economics, computer science, etc.

This course fulfills the Group 4 (Science) requirement for an IB Diploma. So students taking this course do not need to take a traditional lab science course to complete the IB Diploma.

Topics include:

- programming in Java
- constructing efficient algorithms
- Object Oriented Programming and other advanced Java programming techniques
- problem solving through system design and Computational Thinking
- technical details and vocabulary about hardware and computer systems
- binary arithmetic and binary circuits
- technical details of the functioning of networks and the Web
- history and future of computers including artificial intelligence and simulations
- other topics that apply various skills and concepts to a real situation

Students develop problem solving skills, as well as reliable and productive work habits. They learn to design and create computer systems to solve both academic exercises and real-world problems.

About half of the assignments involve Java Programming. Programming assignments are done largely in class, with teacher assistance, but some programming work must be done outside class time. This requires that students bring a laptop to class with them. The teacher will provide all software needed for the class – all software used will be available as free downloads.

The other half of the course involves lectures and discussions about various technical details of how computer systems (including personal computers and the Web) function internally - the part that users don't see. This will be assessed through written quizzes and tests.

IBDP Computer Science Year 2 (HL/SL) Grade 12
Prerequisite: IB Computer Science Year 1

This continues and finishes the topics mentioned in Year 1 course (description above).

In year 2, students must complete a **programming project** to solve a real world problem, for a real user. This project is probably done using the skills learned in the Object Oriented Programming Option of the course. Students choose the topic/problem according to their own interests, such as a game simulation, a database for a teacher or parent, or a program that performs useful math or science calculations . This project contributes 20% (HL) or 30% (SL) of the final IB grade.

The second year of the course ends with an in depth review of all the topics from year 1 and year 2, to prepare for the IB Exams in May.