COMPUTER SCIENCE (SL and HL) – Pre IB Study list

Theory: You need good basic knowledge of how a standard computer works. If you have studied a GCSE level Computer Science course, review it before the term starts. If you have not formally studied computer systems, then the BBC Bitesize GCSE Computer science pages should be studied so that you are familiar with the vocabulary and concepts we will build on. See for example: https://www.bbc.com/bitesize/examspecs/zmtchbk

Practical: It is important that you gain hands-on programming experience preferably using Python. You should download Python (freeware) onto a computer that you have access to. A good place to start with reading about this is: https://www.python.org/about/. Then do some basic programming exercises.

1) Download and install Python (with IDLE) using: http://www.python.org/download/ It is good to check the "Add python to PATH" option to avoid having to manually edit PATH at a later date. (* see below). For how to use the IDLE editor and some video tutorials the first few tutorials in the MyBringBack section at the website below would be good to follow. https://sites.pitt.edu/~naraehan/python3/getting_started_win_first_try.html

2) Recommended is the tutorials as far as file handling at w3schools https://www.w3schools.com/python/ and python tutorials from https://mimo.org/ (free); Also the learn Python course(s) at codecademy. http://www.codecademy.com/ are good.

Desirable: It would be desirable to have done some HTML coding. The w3schools and codecademy sites are very useful for this; recommended is codecademy. Also there is currently a free app for phones called MIMO where you can learn both HTML and python.

Extension: Programming experience using languages such as JavaScript, PHP, Java, C++ etc this will be useful. If you are aiming to impress then there are two python modules that you should follow tutorials for. There are many good tutorials on YouTube for both these two modules. Have a look at a few before you choose one to follow.

1) tkinter (toolkit for making interactive GUI's for python Apps. tkinter come as standard with the python download.

2) Flask web framework module for creating web application in python on your [localhost] device. To download Flask start reading here: https://pypi.org/project/Flask/

* You may have to add the path to python to the PATH environment variable for this install to work (see https://www.educative.io/edpresso/how-to-add-python-to-path-variable-in-windows or https://www.educative.io/edpresso/how-to-add-python-to-the-path-variable-in-mac). Note for the flask installation you may have pip3 not pip depending on your original python installation.

Course summary - COMPUTER SCIENCE (SL and HL)

Syllabus components 1 to 7 are examined in Paper 1. (Teaching hours) [AHL/SL]

Topic 1: System fundamentals (20 hours) [SL]

Topic 2: Computer organization (6 hours) [SL]

Topic 3: Networks (9 hours) [SL]

Topic 4: Computational thinking, problem-solving and programming (45 hours) [SL]

Topic 5: Abstract data structures (23 hours) [AHL]

Topic 6: Resource management (8 hours) [AHL]

Topic 7: Control (14 hours) [AHL]

Case study (30) [AHL] is examined in paper 3 (AHL only)

Additional subject content introduced by the annually issued case study

Case study for 2024 exam: Rescue robots

Options are *examined* in paper 2 (SL)

Students study one of the following options - Web science is the current option studied at Hockerill. (30 hours), at AHL the option is studied in greater depth (+15 hours)
Option A: Databases
Option B: Modelling and simulation
Option C: Web science
Option D: Object-oriented programming (OOP)

Internal assessment (30 hours) [SL]

Practical application of skills through the development of a product and associated documentation.

See hockerillct.com for more details on syllabus content.