Lesson number	Class 1	Class 2	Lesson	Syllabus
1	Fri 20 Aug	Fri 20 Aug	Course introduction	
			Unit 8: Programming	
2	Tue 24 Aug	Mon 23 Aug	Numbers	8.1.1 vars & consts, 8.1.2 (int,real), 8.1.3 input & output
3	Thu 26 Aug	Fri 27 Aug	Arithmetic	8.1.4a sequence 8.1.4f arithmetic operators
4	Wed 01 Sep	Wed 01 Sep	Strings	8.1.1 vars & consts, 8.1.2 (char, str), 8.1.3 (f-strings), 8.1.4e (str handling)
5	Fri 03 Sep	Fri 03 Sep	(exercises)	Including 1 assessed
6	Tue 07 Sep	Mon 06 Sep	Boolean	8.1.2(bool) 8.1.4f Logical & boolean operators
7	Thu 09 Sep	Fri 10 Sep	If/else	8.1.4b selection
8	Wed 15 Sep	Wed 15 Sep	While	8.1.4c iteration, 8.1.4d totaling & counting
9	Fri 17 Sep	Fri 17 Sep	For	8.1.4c iteration, 8.1.4d totaling & counting
10	Tue 21 Sep	Mon 20 Sep	Nested statements	8.1.5 (max 3 deep)
11	Thu 23 Sep	Fri 24 Sep	(exercises)	Including 1 assessed
12	Wed 29 Sep	Wed 29 Sep	Lists/arrays	8.2.1, 8.2.2 Use & understand 1d array
13	Tue 05 Oct	Mon 04 Oct		8.2.1, 8.2.2 Use & understand 2d array
14	Thu 07 Oct	Fri 08 Oct		8.2.3 Read/write arrays with iteration
15	Wed 20 Oct	Wed 20 Oct	(exercises)	Including 1 assessed
16	Fri 22 Oct	Fri 22 Oct	Functions	8.1.6 functions, parameters, local/global variables 8.1.8 Meaningful identifiers, comments
17	Tue 26 Oct	Mon 25 Oct	(exercises)	Including 1 assessed
18	Thu 28 Oct	Fri 29 Oct	Files	8.3 Open/close/read/write files - single items
19	Wed 03 Nov	Wed 03 Nov	(exercises)	Including 1 assessed
20	Fri 05 Nov	Fri 05 Nov	Unit 8 test	
			Unit 7: Algorithm design	
21	Tue 09 Nov	Mon 08 Nov	SDLC	7.1 Analysis, design, coding, testing
22	Thu 11 Nov	Fri 12 Nov	Decomposition	7.2 Identifying subsystems structure diagrams
23	Wed 24 Nov	Wed 24 Nov	Flowcharts	7.2c read/trace flowcharts 7.3 explain purpose of an alg
24	Fri 26 Nov	Fri 26 Nov		7.2c create flowcharts
25	Tue 30 Nov	Mon 29 Nov	Pseudocode	7.2c read/trace pseudocode 7.3 explain purpose of an alg
26	Thu 02 Dec	Fri 03 Dec		7.2c create pseudocode
27	Wed 08 Dec	Wed 08 Dec	Common algorithms	7.4 totalling, counting, min/max, average, linear search
28	Fri 10 Dec	Fri 10 Dec		7.4 bubble sort
29	Tue 14 Dec	Mon 13 Dec	Validation theory	7.5.a Range, length, type, presense, format, check
30	Thu 16 Dec	Fri 17 Dec	Validation programming	7.5.a - range, length, type,, presense, format
			Term holidays	
31	Wed 12 Jan	Wed 12 Jan	Validation programming	7.5.a check - luhn or hkid
32	Fri 14 Jan	Fri 14 Jan	Verification checks	7.5b - visual, double entry
33	Tue 18 Jan	Mon 17 Jan	Test data	7.6 - normal, abnormal, extreme, boundary
34	Thu 20 Jan	Fri 21 Jan	Trace tables	7.7 trace document dry-run. Revisit trace tables with a focus on validation, verification & testing
35	Wed 26 Jan	Wed 26 Jan	Identify errors & correct algorithms	7.8 identify errors, suggest corrections 7.9 amend algs for given scenarios
36	Fri 28 Jan	Fri 28 Jan	(exercises)	
37	Tue 08 Feb	Mon 07 Feb	Unit 7 test	

			Unit 1: Data representation & Unit 2: Data transmission	
38	Thu 10 Feb	Fri 11 Feb	Binary number systems	1.1.1 Why binary 1.1.2a Introduce denary, binary & hex systems 1.1.2b(i) Convert decimal -> binary
39	Wed 16 Feb	Wed 16 Feb		1.1.2b(ii) Convert decimal -> hex 1.1.2b(ii) Convert hex -> binary
40	Fri 18 Feb	Fri 18 Feb	Binary addition	1.1.4 - 8bit binary. Overflow errors (and why)
41	Tue 22 Feb	Mon 21 Feb	Bit shifting	1.1.5 - left & right shift. Manual & Python
42	Thu 24 Feb	Fri 25 Feb	Negative numbers	1.1.6 - 2s complement on 8bit integers & decimal numbers
43	Wed 02 Mar	Wed 02 Mar	(exercises)	
44	Fri 04 Mar	Fri 04 Mar	Data units	1.3.1 bit, nibble, byte, KiB, MiB, GiB, TiB, PiB, EiB. Convert between
45	Tue 08 Mar	Mon 07 Mar	Text data	1.2.1 ASCII & unicode. Including UTF-8. Calculate file size of text
46	Thu 10 Mar	Fri 11 Mar	Audio data	1.2.2 Sample rates & resolution, length. 1.3.2 calculate file sizes of images and sounds
47	Wed 16 Mar	Wed 16 Mar	Image data	1.2.3 Pixels, resolution, color depth 1.3.2 calculate file sizes of images and sounds
48	Fri 18 Mar	Fri 18 Mar	Compression	1.3.3 Purpose of compression 1.3.4 Lossy & lossless (run length encoding)
49	Tue 22 Mar	Mon 21 Mar	(exercises)	
50	Thu 24 Mar	Fri 25 Mar	Data transmission methods	2.1.1 packets 2.1.2 serial/parallel, simplex/half/full duplex
51	Wed 30 Mar	Wed 30 Mar	Error detection	2.2.1 Need for error check 2.2.2 Parity checks, checksum, echo, ARQ
52	Fri 01 Apr	Fri 01 Apr		2.2.3 Check digit revisited
			Term holidays	
53	Tue 19 Apr	Mon 18 Apr	Encryption	2.3.1 Need 2.3.2 How. Symmetric v assymetric. Public/private keys
54	Thu 21 Apr	Fri 22 Apr	(exercises)	
55	Wed 27 Apr	Wed 27 Apr	Unit 1 & 2 test	
			Unit 3 Hardware & Unit 4 Software	
56	Fri 29 Apr	Fri 29 Apr	CPU & fetch/execute cycle	3.1.1 & 3.1.2 CPU, Von Neumann model, registers, CPU cycle
57	Tue 03 May	Fri 06 May	Types of processors	3.1.3 Core, cache, clock impact on performance 3.1.4 Role of instruction set 3.1.5 Embedded system processors
58	Thu 05 May	Wed 11 May	(exercise)	Embedded system practical with Arduinos/Circuit Python
59	Wed 11 May	Fri 13 May	Input & output devices	3.2.1 input devices 3.2.2 output devices
60	Fri 13 May	Mon 16 May	(exercise)	Flash card peer quiz & practice
61	Tue 17 May	Fri 20 May	Sensors	3.2.3a what is a sensor, purpose 3.2.3b data captured by each type and when to use
62	Thu 19 May	Wed 25 May	(exercise)	Sensors practical with Arduinos
63	Wed 25 May	Fri 27 May	(exercise)	Show & tell from practical
64	Fri 27 May	Mon 30 May	Primary & secondary memory	3.3.1, 3.3.2, 3.3.3
65	Tue 31 May	Wed 08 Jun	Virtual memory	3.3.4
66	Thu 02 Jun	Fri 10 Jun	Cloud storage	3.3.5, 3.3.6
67	Wed 08 Jun	Mon 13 Jun	(exercise)	Sign up and use a cloud storage bucket service
68	Fri 10 Jun	Fri 17 Jun	Network interfacing	3.4.1 Role of NIC 3.4.2 MAC address 3.4.3 Internet protocol incl IP4 v IP6 3.4.4 Role of router
69	Tue 14 Jun	Wed 22 Jun	Operating systems	4.1.1 Applications vs OS 4.1.2 Functions of an OS 4.1.3 HW, firmware, OS = Application environment 4.1.4 Interupts
70	Thu 16 Jun	Fri 24 Jun	High / low level languages	4.2.1 high v low level languages 4.2.2 Assembly language 4.2.3 & 4.2.4 Compiler vs interpreter 4.2.5 Role of IDE
71	Wed 22 Jun	Mon 27 Jun	(exercise)	
72	Fri 24 Jun	Fri 01 Jul	Unit 3 & 4 test	
73	Tue 28 Jun	.		
74	Thu 30 Jun			

Provisional plan for Year 11				
Unit 5 Internet				
1	.		The internet	5.1.1 Internet vs WWW 5.1.2 URL 5.1.3 HTTP v HTTPS 5.1.4 Functions of a browser
2			The browser	5.1.5 Retrieval and rendering of a web page including DNS 5.1.6 Cookies
3			(exercise)	Using cookies and localStorage
4			Digital currency	5.2 Digital currency and blockchain
5			(exercise)	
6			Cyber security	5.3 Common threats and their solutions
7			(exercise)	
8			Unit 5 test	
Unit 6 Emerging technology				
9			Automation	6.1.1, 6.1.2 Revisit sensors & microprocessors. Add actuators. Discuss scenarios listed.
10			(exercise)	
11			Robotics	6.2 Understand, describe and role of robotics
12			(exercise)	Use the HiWonder Q-Trucks or Arduinos?
13			(exercise)	
14			(exercise)	
15			(exercise)	
16			Artificial intelligence	6.3 Understand, describe main characteristics, basic operations and components of AI (expert systems and machine learning)
17			(exercise)	Supervised v unsupervised v reinforcement learning Chihuahua or muffin ML?
18			(exercise)	Teachable machine? NIST? YOLOv3? Tictactoe Minimax? Traveling salesman genetic algorithm?
19			(exercise)	Split into groups, each gets a different AI research task to report back
20			(exercise)	
21			(exercise)	
22			(presentations)	
23			Unit 6 test	
Unit 9 Databases				
24			Databases	9.1 Database terminology 9.2 Data types. Scenario exercise
25			Relational databases	9.3 Relational databases, primary & foreign keys, normalisation.
26			SQL	9.4 SELECT, FROM, WHERE, ORDER BY, SUM, COUNT - one table
27			(exercises)	
28			(exercises)	
29			(exercises)	
30			Unit 9 test	
Unit 10 Logic				
31			Logic gates & circuits	10.1 Symbols 10.2 Gate functions & their truth tables
32			Logic circuit diagrams	From circuit to truth table & logic expression
33			Truth tables	From truth table to circuit diagram & logic expression
34			Logic expression	From expression to diagram & truth table
35			(exercise)	Solving written problems
36			Unit 10 test	

Review & practice				
37			(mock exams)	
38			(mock exams)	
39			(mock exams)	
40			(mock exams)	
41			(mock exams)	
42			(mock exams)	
43			(mock exams)	
44			(programming project)	
45			(programming project)	
46			(programming project)	
47			(programming project)	
48			(programming project)	
49			(practice paper 2 style programming questions)	
50			(practice paper 2 style programming questions)	
51			(practice paper 2 style programming questions)	
52			(practice paper 2 style programming questions)	
53			(practice paper 2 style programming questions)	
54			(theory review)	
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60			(theory review)	

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Comment: Sports day TBC