Grade 11/12 - IBDP Computer Science Scope & Sequence					
SL/HL Core		**Each Class: 40 hours** **Classes per week: 4** **Total Hours: 150 + 6-8~**	**HL extension**		**Each Class: 40 hours** **Classes per week: 2** **Total Hours: 240 + 4-6~**
Unit	**Topics**	**Hours**	**Topics**	**Unit**	**Hours**
Year 1 Sem 1					
Topic 4A Computational Thinking and Fundamentals of Programming (Sept – Feb)	4.1.1 - 4.1.3 Procedural Thinking 4.1.4 – 4.1.8 Logical Thinking 4.3.6 – 4.3.13 Programming Basics Program design using flowcharts	12	Topic 6 Resource Management (Sept – Nov)	6.1.1 – 6.1.4 System Resources 6.1.5 – 6.1.9 Role of the Operating System Ethical implications of latest technology advances.	8
Topic 2A Introduction to Computer Science (Sept – Oct)	2.1.1 – 2.1.4 Computer architecture 2.1.5 Secondary memory	5			

	2.1.6 – 2.1.8 Operating System and application Systems. 2.1.9 – 2.1.10 Binary Representation Number System Conversion				
Topic 1A System Fundamentals (Nov - Dec)	1.2.1 – 1.2.3 Components of a computer system 1.1.1 – 1.1.6 Systems in Organizations 1.2.4 – 1.2.11 Design and Analysis Stage 1.1.8 – 1.1.10 User Focus IA Initial Approaches SLC – System Life Cycle	14	Topic 5A Abstract Data Structures (Nov – Jan)	5.1.18 – 5.1.20 Application of Abstract Data Structures 5.1.4 - 5.1.5 2D Arrays 5.1.6 – 5.1.9 Stacks and Queues	11
Topic DA Introduction to OOP (Dec - Feb)	D.1.1 – D.1.4 Objects as a programming concept D.2.1, D.2.4, D.2.7 Encapsulation D.4.5 – D.4.6	24			

	Object Reference (HL) D.3.1 – D.3.7 Methods and Programming with Objects. D.2.2, D.2.5 Inheritance OOP and GUI Modular programming approach				
Year 1 Sem 2					
Topic 4B Algorithmical Thinking and Advanced Programming (Mar – Jun)	4.2.1 Search and Sort Algorithms 4.2.2 – 4.2.6 Algorithmical Thinking 4.2.7 – 4.2.9 Program Design 4.3.1 – 4.3.5 Programming languages	28	Topic 5B Abstract Data Structures Applied (Feb – Mar	5.1.11 – 5.1.13 Linked Lists D.4.11 – D.4.12 Linked and ArrayLists 5.1.14 – 5.1.17 Binary Trees D.4.7 – D.4.8 Applications of ADT Non- binary trees D.4.13 – D.4.14 Uses of collections Fundamentals of Machine Learning D.4.15 Style and conventions in coding Introduction to JETS Program writing using Pseudocode	18

				Introduction to Approved Notation GUI Java development Databases and Files I/O access in Java	
Topic DB OOP Applied (Mar - May)	D.2.3, D.2.6 Polymorphism D.3.8 Arrays of Objects 4.1.17 – 4.1.20 Thinking Abstractly D.1.5 – D.1.8 Program Design with OOP D.2.8 – D.2.10, D.3.9 – D.3.10 Advantages and Limitations of OOP GUI and OOP	6	Topic D Ext OOP Extension (Apr – May)	5.1.10 Stacks and Queues with arrays D.4.9 – D.4.10 List static representation	3
Topic 1B System Implementation (May – Jun)	1.1.7 Testing 1.1.11 – 1.1.13 System Backups 1.1.14 Updates 1.2.12 – 1.2.16	8	Case Study 1 Research Topic (May - June)	Intro to Case Study Research	10

	Usability and Human Interaction with the system IA Parts A and B Moral and ethical issues from interaction with humans.				
Year 2 Sem 1					
Topic 4C IA Development and documentation (Sept – Jan)	IA Part C IA Part D IA Part E Peer reviewing	28	Topic 5C Recursion (Sept - Oct)	5.1.1 – 5.1.3 Thinking Recursively D.4.1 – D.4.4 Recursive Algorithms Recursive looping	4
Topic 2B Simple Logic Gates (Sept - Oct)	2.1.11 – 2.1.13 Simple Logic Gates Circuit Design Boolean Algebra	1	Topic 7 Control Systems (Nov - Dec)	7.1.1 – 7.1.6 Centralized Control Systems 7.1.7 – 7.1.8 Distributed Control Systems	14
Group 4 Project - 10 Hours					
Topic 3 Networks (Nov - Jan)	3.1.1 -3.1.3 Network Fundamentals Network Hardware Network Terminology 3.1.4 – 3.1.5 VPNs 3.1.6 – 3.1.11 Data Transmission 3.1.12 – 3.1.16 Wireless Networks	9	Case Study 2 Research Topic (Dec - Jan)	Technical vocabulary	8

Year 2 Sem 2					
IA Wrap Up (Feb-Mar)	IA Revision and adjustments	2~	Case Study 3 Research Topic (Feb - Mar)	Technical writing	12
Topic 4D System planning and organization (Mar – Apr)	4.1.9 – 4.1.13 Thinking Ahead 4.1.14 – 4.1.16 Thinking Concurrently Complex Systems Design Systems and Organizations	3			
Revision T1 – T4, TD (Apr – May)	Paper 1 preparation Paper 2 preparation	6-8~	Revision T5, T6, T7, TD Ext (Apr – May)	Paper 1 preparation Paper 2 preparation Paper 3 preparation	4-6~