GES AS Computer Science Term 1 (Sept-Oct, 2019-20)

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| TOPIC: Data Structures |

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| Theme: Using Data Structures in problem Solving. | Level: Year 12 |
| Objectives: *To use Data representation to store Analogue data in Digital format* |

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| Focussing Questions | Key Words |
| **Theory: Theory Fundamentals**1. Describe the use of binary arithmetic in programming?
	1. How can a positive or negative integer be expressed in binary arithmetic?
	2. What is 2’s compliment and how is it used in binary arithmetic?
2. Describe how analogue data is stored on a digital system.
	1. How can images be stored on a digital system?
	2. How are Sound and Video data stored on a digital system?
3. The use of Compression of Data.
	1. What is Data Compression?
	2. Why is Data compression needed in file transfers?

**Practical**1. Data structures; arrays or lists
	1. What is a List and how can a One-Dimensional List be implemented in Programming?
	2. What is a 2-dimensional or Multi-list and how can this structure be implemented in programming?
	3. What are the different methods used in List Comprehension?
	4. How can a List be initialised using Iteration?
2. Algorithm design and problem-solving
	1. How can different algorithms be used to design a solution.
	2. What are Structure charts and how is it used in programming?
3. Programming tasks.
	1. How to create a quiz using one-dimensional as well as multi-dimensional lists
 | Number Bases2’s ComplimentBinary Coded DigitSamplingLossyLosslessCompressionRun Length EncodingJPEGMPEGMP3MP4ArchivePDF2 Dimensional ListsArraysIndexList ElementsUpper Bound ElementList Comprehension | Explaining words...so.....because...Therefore...As a result...This means that...Therefore...This caused......Due to the fact......caused…However |

**Text Book: departmental textbooks and Worksheets.**