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 Bases  2’s Compliment  Binary Coded Digit  Sampling  Lossy  Lossless  Compression  Run Length Encoding  JPEG  MPEG  MP3  MP4  Archive  PDF  2 Dimensional Lists  Arrays  Index  List Elements  Upper Bound Element  List 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.**