KS4 COMPUTER SCIENCE

Immanuel COMPUTER SCIENCE — Building the world, one line at a time

IMMANUEL COLLEGE

Y10

DATA REPRESENTATION PART 1

- BINARY, HEXADECIMAL CONVERSIONS, & CHARACTER REPRESENTATION
- BINARY ARITHMETIC
- CONVERTING DATA FORMATS

COMPUTATIONAL THINKING & BASIC ALGORITHMS / BOOLEAN LOGIC & COMPUTER ARCHITECTURE

- VON NEUMANN ARCHITECTURE
- PRINCIPLES OF COMPUTATIONAL THINKING

PROGRAMMING FUNDAMENTALS

- WRITE PROGRAMS
- STRING MANIPULATION & BASIC INPUT/OUTPUT OPERATIONS
- VARIABLES, CONSTANTS, DATA TYPES, & OPERATORS

CONTROL STRUCTURES & ALGORITHMS

- VARIABLES, CONSTANTS, DATA TYPES, & OPERATORS
- COMPUTATION THINKING FOR ABSTRACT PROBLEM SOLVING
- LOGIC GATES (AND, OR, NOT) & TRUTH TABLES
- COMPUTATIONAL THINKING TO PROBLEM SOLVING
- SEARCHING & SORTING ALGORITHMS

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DATA REPRESENTATION PART 2

- STRING MANIPULATION & BASIC INPUT/OUTPUT OPERATIONS
- DEBUG CODE: SYNTAX & LOGIC ERRORS
- USE THE PRIMM MODEL IN PROGRAMMING

DATA STRUCTURES

- CREATE, INTERPRET & DEBUG ALGORITHMS
- ALGORITHM DESIGN, FLOWCHARTS, & TRACE TABLES

NETWORKS

- UNDERSTANDING DATA STORAGE
- CALCULATING STORAGE REQUIREMENTS
- DATA STORAGE UNITS & CONVERSIONS

PROGRAMMING APPLICATIONS

- ARRAYS (1D & 2D), SUBPROGRAMS (FUNCTIONS & PROCEDURES)
- USE MODULES
- CREATE SIMPLE FUNCTIONS

ETHICS, LEGAL & SOCIETAL ISSUES / PROGRAMMING PROJECT

- IDENTIFY REASONS BEHIND EACH OF THE FILE FORMATS
- DESCRIBE LOSSY & LOSSLESS COMPRESSION
- MAKE USE OF ASCII AND UNICODE

SYSTEM SOFTWARE & STORAGE DEFENSIVE DESIGN & SECURITY

- WRITE REUSABLE, MODULAR PROGRAMS USING ARRAYS AND SUBPROGRAMS
- DEFINE SIMPLE PROCEDURES
- DEVELOP PROGRAMS USING FUNCTIONS & PROCEDURES

REVISION

- NETWORK TOPOLOGIES (TCP/IP)
- ANALYSE NETWORK SETUPS & APPLY PROTOCOLS TO SCENARIOS

EXAMS

- INTRODUCTION TO SQL: SELECT, FROM, WHERE QUERIES
- PERFORM FILE OPERATIONS & WRITE SQL STATEMENTS TO MANAGE DATA

- NETWORK TYPES (LAN/WAN)
- NETWORK HARDWARE
- NETWORK PROTOCOLS
- FILE HANDLING OPERATIONS (READ, WRITE & MANIPULATE FILES)
- USE OF LISTS & INDEXING IN PROGRAMS
- EVALUATE THE SOCIETAL IMPACT OF TECHNOLOGY AND UNDERSTAND LEGAL FRAMEWORKS
- DEVELOP PROBLEM-SOLVING, DEBUGGING, & PRACTICAL CODING SKILLS
- DESIGN, IMPLEMENT, & TEST A PROGRAM FOR A GIVEN SCENARIO
- UNDERSTAND SYSTEM FUNCTIONALITY AND COMPARE STORAGE TYPES
- PRIMARY & SECONDARY STORAGE
- OPERATING SYSTEMS & UTILITY SOFTWARE
- EVALUATE PROGRAM
- LEGISLATION
- ETHICAL, ENVIRONMENTAL, CULTURAL, & PRIVACY ISSUES
- IMPLEMENT SECURE CODING PRACTICES
- NETWORK THREATS & PREVENTION METHODS
- UNDERSTAND CYBER SECURITY MEASURES