Department Intent: To equip students to be compassionate users and curious innovators of technology

truthful eloquent curious wise generous active hopeful attentive grateful discerning compassionate faith-filled intentional loving learned prophetic

Attributes Skills Knowledge

Mastery at Year 13:
- Independence developed with Programming Project completion
- Understanding of and ability to apply the fundamental principles and concepts of computer science including; abstraction, decomposition, logic, algorithms and data representation.
- Analyse problems in computational terms through practical experience of solving such problems including writing programs to do so
- Design, program and evaluate computer systems that solve problems, making reasoned judgements about these and presenting conclusions

Mastery at Year 12:
- Independence developed with Programming Project completion
- Understand and Evaluate the individual (moral), social (ethical), legal and cultural opportunities and risks of digital technology
- Understand the characteristics of contemporary processors, input, output and storage devices
- Understand Software and software development
- Exchanging data
- Data types, data structures and algorithms

Mastery at Year 11
- Understand and apply the fundamental principles and concepts of Computer Science, including abstraction, decomposition, logic, algorithms, and data representation
- Analyse problems in computational terms through practical experience of solving such problems, including designing, writing and debugging programs in Python and Pseudocode
- Understand the components that make up digital systems, and how they communicate with one another and with other systems
- Understand and Evaluate the impacts of digital technology to the individual and to wider society

Mastery at Year 10
- Use Decomposition and Abstraction to simplify problems
- Know and use programming techniques to Interpret and write algorithms using Flowcharts and Pseudocode.
- Understand and perform the Search and Sort algorithms
- Secure knowledge in the basic architecture of computer hardware: CPU, Memory, Secondary Storage devices Computer networks. Understand how data is stored in binary and be able to use the conversions in additions. Know why different topologies suit different scenarios.

Mastery at Year 9
- Explain the impact of technology on ethical, legal and environmental issues
- Create, reuse, revise and repurpose digital artefacts for a given audience by creating simple webpages for a website
- Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming
- Understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers
- Use computational thinking skills to solve real world problems and physical systems
- Use programming language (Python), to solve a variety of computational problem

Mastery at Year 8
- Use online tools, recognize inappropriate content and being safe online
- Create, reuse, revise and repurpose digital artefacts for a given audience by creating simple webpages for a website
- Identify and solve a real world problem by design an app for a community
- Perform calculations, display and analyze data using Spreadsheet models that represent real life systems
- Use computational thinking skills to solve real world problems and physical systems
- Use programming languages(Scratch , Python), to solve a variety of computational problems

Mastery at Year 7
- Use technology safely and responsibly (online)
- Use Microsoft software skills(Spreadsheet, Word & PowerPoint) for everyday life.
- Understand the hardware and software components that make up computer systems
- Use computational thinking skills to solve real world problems and physical systems
- Use programming languages(Scratch , Python), to solve a variety of computational problems

Computer System Theory | Programming Techniques | Oracy

Key Skills

Creativity & Design Thinking | Problem Solving & Algorithmic Thinking | Digital Literacy

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Data Types | Data Structure | Network & Database | Web Technology | Wired and Wireless Networks | Algorithms

Explain the different components, registers of the CPU within the FDE cycle
Discuss the factors that affect the performance of the CPU
Discuss the differences between Von Neumann and Harvard architectures.
Discuss the differences between CISC and RISC

Explain how the input, storage and output devices work, and be able to recommend appropriate devices for specific situations and be able to justify choices made..

What are the issues created and addressed by technology? How does technology impact on key stakeholders?

Explain the computational thinking skills, be able to apply the skills to a specific scenario
Discuss the following computational methos: data mining, back tracking, visualisation

Ethical, Legal and Environmental Issues of Technology

Computational Thinking & Algorithms

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Systems Architecture | Input, Output and Storage Devices | Programming Techniques | Systems Software

Explain the need for, function and purpose of an operating systems.
Explain Memory management (paging, segmentation and virtual memory).
Interrupts, the role of interrupts within the fetch decode execute Cycle and Scheduling methods

Ethical, Legal and Environmental Issues of Technology

1.8 Ethical, Legal and Cultural Concerns
What are the issues created and addressed by technology? How does technology impact on key stakeholders?

Boolean Logic

1.4 System Security
What are the forms of attack happen to computers and networks?
How to prevent attacks?

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Programming Techniques | Translators & IDE | Robust Programming | Systems Security

1.5 System Software
Describe what is System Software? Explain what are the functions of operating systems? What is utility software?

Systems Software

Draw and complete the truth tables for each logic gate
Create, complete or edit logic diagrams and truth tables for given scenarios with one or more than one gate in a logic diagram
Give output of the Boolean expression or scenario

2.5 Translators and IDEs
What is the purpose of a translator? What are the characteristics of compilers, interpreters and assemblers? Tools in an IDE.

2.3 Robust/ Defensive Programming
Why is defensive programming necessary? How to create code which is easy to maintain? What is the purpose of testing and the different types of testing?

What is a network? Explain the benefits and drawbacks of networking? Explain the the difference between a LAN, and a WAN? Explain how is data transmitted across networks using protocols? Explain the types of hardware required are for wired and wireless data transmission. Describe the properties, advantages and disadvantages of star and mesh topologies. Why and for what purposes are protocols used?

Wired and Wireless Networks

1.2.4 Data Representation
Why do computer only understand Binary? Convert between denary, binary & hex. Add binary numbers. Character sets and why they are used.
Explain how are images represented as Binary?
Explain how is sound represented as Binary?
Explain Compression, the different types and need for

Secondary Storage

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Computational Thinking & Algorithms | Programming Techniques | Systems Architecture | Memory

What is a network? Explain the benefits and drawbacks of network? Explain the the difference between a LAN, and a WAN? Explain how is data transmitted across networks using protocols? Explain the types of hardware required are for wired and wireless data transmission

2.1 Algorithms
Using abstraction, decomposition and algorithmic thinking to define a problem. Can you efficiently search and sort data.? Can you interpret and write algorithms using Flowcharts 7 Pseudocode.

Explain each action and register used at each stage of the fetch-execute cycle. Describe the role/purpose of each component and what it manages, stores, or controls during the fetch-execute cycle. Describe the purpose of each register, what it stores (data or address). Discuss the factors that affect the performance of the CPU.
Define what embedded systems are and identify and give examples of them

1.2.1 Memory
What is the purpose of RAM and ROM? What are the differences between RAM and ROM? Why do we need virtual memory? What is flash memory?

Why do we need secondary storage? What are optical, magnetic and solid state storage? How is each suitable for different purposes?

Computer System 3: Networks

Discuss some of the ethical and environmental issue that technology can create
Describe the different laws that are related to technology: Computer Misuse Act, Copyright and Pattern and design, Data Protection, Creative commons

Advance Text Programming (Python - Microbits)

What is a graphic?
Create a graphic using layers, text to create a graphic

Graphics Design | Computer System 2: Data Representation | My Digital World 3

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Write and Interpret algorithms: flowchart and pseudocode
Write code using the 3 programming construct?
Draw shapes using python turtle
Use user input to draw shapes
What are the 2 types of loops?
Can you create a function?

Text Programming (Python)

Why do computers only understand Binary? Convert between denary, binary & hex. What is a Character set and why they are used.
How are images represented as Binary?
How is sound represented as Binary?

What is the difference between the Internet and the world wide web, a web browser and search engine?
Explain how data is transmitted over the internet
Do you know the everyday online tools used like; search engine, favourite, Cloud? Give examples of each
Use advance search on Google to search for a keyword

What is a spreadsheet model?
Write simple spreadsheet formulas and functions?
Do you Know how to format a spreadsheet
Do you Know how create charts

Data Modelling (Spreadsheet)

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My Digital World 2 | Website Programming (HTML) | App Design (AWS GET IT)

Write code using the 3 programming construct?
Draw shapes using python turtle using loops and function
Use user input to draw shapes

What are the differences between a Bitmap and a Vector graphic
Can you identify and write the tags to create a webpage: HTML, paragraph, image, hyperlink, bold?
Design and create at least 2 webpages of an artist of your choice using HTML.

Know the stages of the designing an app
Problem Identification
Can you identify a problem area in your community to solve?
Have you clearly identified your target user?
Solution
What research have you done to support your idea? Do similar apps exist and how is your idea different? Does your app idea demonstrate long term benefits to your school or community?
Using Technology
Presentation
Present your solution to your classmates and this will assessed and feedback given

Text Programming (Python Turtle)

Visual Programming (Scratch)

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Computational Thinking | Computer System 1 | Intro to StJ, E-safety

Do you know the 3 programming construct?
Can you create a game with input, output, the different levels and score in Scratch?

Can you use computational thinking skill to solve a problem?
Can you create and interpret algorithms- flowcharts
Describe the 4 computational skills?

Identify and explain the components of a Computer System?
Identify the different input and output devices
Design a device for a purpose and a target audience
Explain the fetch execute cycle?

Can you communicate and use responsibly the school e-mail, Teams, OneDrive?
Do you know how to use Office software; Word, PowerPoint and Excel

' UNLOCKING BELIEF IN ALL '