

| St. Mary's Catholic High School (2026-2027)      |                                                                                                                                                              |                                                                                                                 |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
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| YEAR 12 LONG TERM PLAN with CURRICULUM STANDARDS |                                                                                                                                                              |                                                                                                                 |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
| IAS COMPUTER SCIENCE THEORY - UNIT 1             |                                                                                                                                                              |                                                                                                                 |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
| YEAR 12                                          | WEEK 1- Aug last week and Sept 1st Week                                                                                                                      | WEEK 2- Sep 2nd Week                                                                                            | WEEK 3 - Sep 3rd Week                                                                                                    | WEEK 4 - Sep 4th Week                                                                                                                             | WEEK 5-Sep 5th Week and Oct 1st Week                                                                                                                | WEEK 6 Oct 2nd Week                                                                                                                 | WEEK 7 - Oct 4th Week                                                                                                            | WEEK 8- Oct 5th Week                                                                                                                                                              | WEEK 9- Oct 5th Week                                                                                                                                                        | WEEK 10- Nov 2nd Week                                                                                                                                                                                         |
| TERM 1                                           | TOPIC 1 - COMPUTER SYSTEMS                                                                                                                                   |                                                                                                                 |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     | TOPIC 2 - DATA REPRESENTATION                                                                                                    |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
|                                                  | Stored-program concept, Von Neumann architecture,Internal components: CPU and memory                                                                         | Internal components: input/output and buses, CPU components: CU, ALU, clock, CPU components: registers          | FDE cycle: stages, roles of components,FDE cycle: use of read/write control signals,Memory hierarchy                     | Data transmission,Role of the OS,Multitasking: time sharing and context switching                                                                 | Multitasking: interrupt handling,Process management: process, process states, scheduling,scheduling algorithms                                      | Memory management: operations and allocation techniques,Memory management: allocation techniques,stack frame                        | Number bases: binary and denary,further binary and hexadecimal,Units of measurement                                              | Two's complement representation of signed numbers,Fixed-point representation of signed fractional numbers                                                                         | Addition and subtraction,Bitwise manipulation,Overflow and underflow & Character encoding systems                                                                           | Recap on Data Representation                                                                                                                                                                                  |
| YEAR 12                                          | WEEK 11 - Dec 1 and 2rd Week                                                                                                                                 | WEEK 12 - Jan 1st Week                                                                                          | WEEK 13 - Jan 2nd Week                                                                                                   | WEEK 14 - Jan 3rd Week                                                                                                                            | WEEK 15- Jan 4th Week                                                                                                                               | WEEK 16- Feb 1st Week                                                                                                               | WEEK 17- Feb 2nd Week                                                                                                            | WEEK 18- Feb 3rd Week                                                                                                                                                             | WEEK 19 Feb 4th Week                                                                                                                                                        | WEEK 20 - March 1st Week                                                                                                                                                                                      |
| TERM 2                                           | TOPIC 3 - NETWORKS AND ENCRYPTION                                                                                                                            |                                                                                                                 |                                                                                                                          | TOPIC 4 -STRUCTURING DATA                                                                                                                         |                                                                                                                                                     |                                                                                                                                     | TOPIC 5 -PROBLEM SOLVING                                                                                                         |                                                                                                                                                                                   |                                                                                                                                                                             | TOPIC 6 -ENABLING TECHNOLOGIES                                                                                                                                                                                |
|                                                  | Network components: NIC, switch, home router, modem, WAP, transmission media, firewall,Network metrics: bandwidth, speed/transfer rate                       | Network metrics: latency, range,Network addressing,Encryption fundamentals & Monoalphabetic substitution cipher | Vernam cipher algorithm,Methods of encryption: symmetric and asymmetric, Entity-relationship model: entity,attribute,key | Entity-relationship model: relationship cardinality,ways of representing,Logical schemas: table/relation, column/attribute, row/tuple, data types | Logical schemas: integrity constraints,Data structures: Lists, records,Tuple, dictionary                                                            | Data structures: Arrays and set,Data structures overview,Stack and Queue introduction, Further Practice using stacks and queues     | Algorithms,Trace table,Recursion,Further practice on recursion,Linear search algorithm: unsorted array and sotred array          | Binary search algorithm: iterative and recursive,Bubble sort algorithm, Trace tables for Bubble sort algorithm,Insertion sort algorithm,Trace tables for insertion sort algorithm | Boolean expressions: Boolean operators and order of precedence, Truth table,Further practice on truth tables,Procedural and Declarative programming paradigm                | Big data: Five Vs infrastructure,Tools and techniques of data science,Categories of AI, Machine learning: supervised and unsupervised,Large language model: context and query accuracy, knowledge limitations |
| YEAR 12                                          | WEEK 21- March 3rd Week                                                                                                                                      | WEEK 22- March 4th and 5th and April 1st Week                                                                   | WEEK 23- April 3rd Week                                                                                                  | WEEK 24 - April 4th Week                                                                                                                          | WEEK 25 April 5th Week                                                                                                                              | WEEK 26 - May 1st Week                                                                                                              | WEEK 27- June 1st Week                                                                                                           | WEEK 28 - June 3rd Week                                                                                                                                                           | WEEK 29 -June 3rd Week                                                                                                                                                      | WEEK 30- June 4th Week                                                                                                                                                                                        |
| TERM 2                                           | TOPIC 6 -ENABLING TECHNOLOGIES                                                                                                                               | REVISION AND EXAMINATION                                                                                        |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
|                                                  | Large language model: bias/subjectivity,Integrated development environment,Version control system,Open source technologies,Application programming interface | Revision, Mock Examination and Board Examination                                                                |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
| IAS COMPUTER SCIENCE PRACTICAL - UNIT 2          |                                                                                                                                                              |                                                                                                                 |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
| YEAR 12                                          | WEEK 1- Aug last weekSept 1st Week                                                                                                                           | WEEK 2- Sep 2nd Week                                                                                            | WEEK 3 - Sep 3rd Week                                                                                                    | WEEK 4 - Sep 4th Week                                                                                                                             | WEEK 5-Sep 5th WeekOct 1st Week                                                                                                                     | WEEK 6 Oct 2nd Week                                                                                                                 | WEEK 7 - Oct 4th Week                                                                                                            | WEEK 8- Oct 5th Week                                                                                                                                                              | WEEK 9- Oct 5th Week                                                                                                                                                        | WEEK 10- Nov 2nd Week                                                                                                                                                                                         |
| TERM 1                                           | TOPIC 7 - PROGRAMMING CONSTRUCTS                                                                                                                             |                                                                                                                 |                                                                                                                          | TOPIC 8 - ORGANISING AND HANDLING DATA: PART 1: DATA TYPES AND STRUCTURES                                                                         |                                                                                                                                                     | TOPIC 8 - ORGANISING AND HANDLING DATA: PART 2: DATA HANDLING METHODS                                                               |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
|                                                  | Sequence, selection,match,Iteration, count controlled                                                                                                        | Iteration, condition controlled,Exceptions,Variables and constants                                              | Operators: arithmetic, relational,boolean, bitwise, Subprograms                                                          | Data types,Implementation project                                                                                                                 | Array and list structures,Record, tuple, sets, 2D data structures                                                                                   | Dealing with numbers (rounding, truncation, randomisation),Math library                                                             | Date/time library,Data type conversions,String length, indexing, formatting, Manipulating strings,Project on string manipulation | Text files: open, write/append, read,Data structures (dictionary), Dictionary subprograms,Project on handling numbers, text files, data structures                                | Stack data structure,Queue data structure,Set data structure, Stacks, Queues and Sets project                                                                               | Recap on Data Handling Methods                                                                                                                                                                                |
| YEAR 12                                          | WEEK 11 - Dec 1 and 2rd Week                                                                                                                                 | WEEK 12 - Jan 1st Week                                                                                          | WEEK 13 - Jan 2nd Week                                                                                                   | WEEK 14 - Jan 3rd Week                                                                                                                            | WEEK 15- Jan 4th Week                                                                                                                               | WEEK 16- Feb 1st Week                                                                                                               | WEEK 17- Feb 2nd Week                                                                                                            | WEEK 18- Feb 3rd Week                                                                                                                                                             | WEEK 19 Feb 4th Week                                                                                                                                                        | WEEK 20 - March 1st Week                                                                                                                                                                                      |
| TERM 2                                           | TOPIC 8 - ORGANISING AND HANDLING DATA: PART 3: RELATIONAL DATABASES                                                                                         |                                                                                                                 | TOPIC 9 - BEST PRACTICE                                                                                                  |                                                                                                                                                   |                                                                                                                                                     | TOPIC 10 - COMPUTATIONAL THINKING AND ALGORITHMS                                                                                    |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
|                                                  | SQLite introduction, SQLite manipulate,SQLite retrieve, filter and refine                                                                                    | SQLite Join,SQLite update and delete,SQLite project                                                             | Decomposition and logic,Decomposition and design project,Good practice in program design                                 | Implementing modularity,Producing consistent code,Producing readable code                                                                         | Consistency/readability project,Control code behaviour                                                                                              | Fit for purpose - test and debug, Fit for purpose - review and refine,Test/debug review/refine project                              | Computational Thinking - abstraction,Decomposition,Pat tern recognition and generalisation                                       | Create programs from algorithms expressed in words,Create a program from algorithm expressed in diagrams                                                                          | Linear search: basic,improved,Binary search - iterative, Bubble sort:worse case,improvements                                                                                | Insertion sort,Sort comparisons,Recursive Algorithms                                                                                                                                                          |
| YEAR 12                                          | WEEK 21- March 3rd Week                                                                                                                                      | WEEK 22- March 4th and 5th and April 1st Week                                                                   | WEEK 23- April 3rd Week                                                                                                  | WEEK 24 - April 4th Week                                                                                                                          | WEEK 25 April 5th Week                                                                                                                              | WEEK 26 - May 1st Week                                                                                                              | WEEK 27- June 1st Week                                                                                                           | WEEK 28 - June 3rd Week                                                                                                                                                           | WEEK 29 -June 3rd Week                                                                                                                                                      | WEEK 30- June 4th Week                                                                                                                                                                                        |
| TERM 2                                           | TOPIC 10 - COMPUTATIONAL THINKING AND ALGORITHMS                                                                                                             | REVISION AND EXAMINATION                                                                                        |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
|                                                  | Binary search - recursive,Final project                                                                                                                      | Revision, Mock Examination and Board Examination                                                                |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
| YEAR 13 LONG TERM PLAN with CURRICULUM STANDARDS |                                                                                                                                                              |                                                                                                                 |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
| IAL COMPUTER SCIENCE THEORY - UNIT 3             |                                                                                                                                                              |                                                                                                                 |                                                                                                                          |                                                                                                                                                   |                                                                                                                                                     |                                                                                                                                     |                                                                                                                                  |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
| YEAR 13                                          | WEEK 1- Aug last week/Sept 1st Week                                                                                                                          | WEEK 2- Sep 2nd Week                                                                                            | WEEK 3 - Sep 3rd Week                                                                                                    | WEEK 4 - Sep 4th Week                                                                                                                             | WEEK 5-Sep 5th Week/Oct 1st Week                                                                                                                    | WEEK 6 Oct 2nd Week                                                                                                                 | WEEK 7 - Oct 4th Week                                                                                                            | WEEK 8- Oct 5th Week                                                                                                                                                              | WEEK 9- Oct 5th Week                                                                                                                                                        | WEEK 10- Nov 2nd Week                                                                                                                                                                                         |
| TERM 1                                           | TOPIC 11 - COMPUTER SYSTEMS AND DATA REPRESENTATION                                                                                                          |                                                                                                                 |                                                                                                                          |                                                                                                                                                   | TOPIC 12 - NETWORKS AND CYBERSECURITY                                                                                                               |                                                                                                                                     | TOPIC 13 - PROGRAMMING LANGUAGES                                                                                                 |                                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                                                                                               |
|                                                  | Harvard Architecture, CISC and RISC, Five-stage instruction pipelining                                                                                       | Parallel processing, Embedded systems hardware components, More embedded systems hardware components            | Embedded systems software components, I/O device management in the OS                                                    | Containerisation, Virtual machines, Floating-point representation                                                                                 | The OSI model, Protocol stacks, Packet switching, DNS, Hardware and software of the IoT, IoT connectivity and cloud platform IoT cloud applications | The CIA triad model, RSA encryption, Vulnerabilities of RSA encryption, Parity checking, Checksums, Cloud computing, Edge computing | Object-oriented programming: terminology, OOP concepts                                                                           | UML class diagrams, More UML class diagrams                                                                                                                                       | Functional programming: terminology, concepts, Assembly language: Mnemonics and instructions, Assembly language addressing modes, Assembly language operations and comments | Recap on Programming Languages                                                                                                                                                                                |

|                                         |                                                                                                                                                                          |                                                                                     |                                                                               |                                                                                                         |                                                                                                         |                                                                                                             |                                                                                               |                                                                                                                              |                                                                                                                                                                     |                                                                                             |
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| YEAR 13                                 | WEEK 11 - Dec 1 and 2rd Week                                                                                                                                             | WEEK 12 - Jan 1st Week                                                              | WEEK 13 - Jan 2nd Week                                                        | WEEK 14 - Jan 3rd Week                                                                                  | WEEK 15- Jan 4th Week                                                                                   | WEEK 16- Feb 1st Week                                                                                       | WEEK 17- Feb 2nd Week                                                                         | WEEK 18- Feb 3rd Week                                                                                                        | WEEK 19 Feb 4th Week                                                                                                                                                | WEEK 20 - March 1st Week                                                                    |
| TERM 2                                  | TOPIC 13 - PROGRAMMING LANGUAGES                                                                                                                                         | TOPIC 14 - STRUCTURING DATA                                                         |                                                                               |                                                                                                         |                                                                                                         | TOPIC 15 - PROBLEM SOLVING                                                                                  |                                                                                               |                                                                                                                              |                                                                                                                                                                     | TOPIC 16 - EMERGING TECHNOLOGIES AND PROFESSIONAL PRACTICE                                  |
|                                         | Assembly language: Mnemonics and instructions, Assembly language addressing modes, Assembly language operations and comments                                             | Linked list: structure, Linked list: ways to represent, Linked list operations      | Hash tables: structure, Hash tables: ways to represent, Hash table operations | Graphs: structure, ways to represent, Graph types, Graph operations, More graph operations (traversals) | Trees: structure and types, Tree operations, traversals, Circular queue: structure and operations       | Problem-solving techniques: brute force/exhaustive, divide-and-conquer, greedy algorithms, heuristics       | Problem-solving techniques: backtracking, recursion, tracing algorithms, Merge sort algorithm | Quick sort algorithm, Dijkstra's shortest path algorithm, Big O notation concepts, Boolean algebra: commutative, associative | Boolean algebra: absorptive, distributive and double negative laws, De Morgan's law and double negation, Practice on simplifying Boolean expressions, Karnaugh maps | Digital signatures and certificates, Hash digest and use of public/private keys, Blockchain |
| YEAR 13                                 | WEEK 21- March 3rd Week                                                                                                                                                  | WEEK 22- March 4th and 5th and April 1st Week                                       | WEEK 23- April 3rd Week                                                       | WEEK 24 - April 4th Week                                                                                | WEEK 25 April 5th Week                                                                                  | WEEK 26 - May 1st Week                                                                                      | WEEK 27- June 1st Week                                                                        | WEEK 28 - June 3rd Week                                                                                                      | WEEK 29 -June 3rd Week                                                                                                                                              | WEEK 30- June 4th Week                                                                      |
| TERM 2                                  | TOPIC 16 - EMERGING TECHNOLOGIES AND PROFESSIONAL PRACTICE                                                                                                               | REVISION AND EXAMINATION                                                            |                                                                               |                                                                                                         |                                                                                                         |                                                                                                             |                                                                                               |                                                                                                                              |                                                                                                                                                                     |                                                                                             |
|                                         | Quantum computing: qubits and principles, threat and quantum-safe cryptography, Deep learning, Responsible practices: ethical issues, legal frameworks, codes of conduct | Revision, Mock Examination and Board Examination                                    |                                                                               |                                                                                                         |                                                                                                         |                                                                                                             |                                                                                               |                                                                                                                              |                                                                                                                                                                     |                                                                                             |
| IAL COMPUTER SCIENCE PRACTICAL - UNIT 4 |                                                                                                                                                                          |                                                                                     |                                                                               |                                                                                                         |                                                                                                         |                                                                                                             |                                                                                               |                                                                                                                              |                                                                                                                                                                     |                                                                                             |
| YEAR 13                                 | WEEK 1- Aug last weekSept 1st Week                                                                                                                                       | WEEK 2- Sep 2nd Week                                                                | WEEK 3 - Sep 3rd Week                                                         | WEEK 4 - Sep 4th Week                                                                                   | WEEK 5-Sep 5th WeekOct 1st Week                                                                         | WEEK 6 Oct 2nd Week                                                                                         | WEEK 7 - Oct 4th Week                                                                         | WEEK 8- Oct 5th Week                                                                                                         | WEEK 9- Oct 5th Week                                                                                                                                                | WEEK 10- Nov 2nd Week                                                                       |
| TERM 1                                  | TOPIC 17 - PROGRAMMING                                                                                                                                                   |                                                                                     |                                                                               |                                                                                                         |                                                                                                         |                                                                                                             | TOPIC 18 - REPRESENTING AND HANDLING DATA                                                     |                                                                                                                              |                                                                                                                                                                     |                                                                                             |
|                                         | Program constructs, Datatypes, variables, constants, String manipulation methods                                                                                         | Additional operators, One and two dimension data structures, Computational thinking | Development environments, Libraries file, modules, subprograms                | The decimal class, Compare functions, exceptions, Introduction to regular expressions, Regex functions  | Regex special characters and qualifiers, Regex examples, NumPy introduction, NumPy arithmetic functions | NumPy shape, size and reshape, NumPy datatypes and maths functions, Pandas introduction, Pandas data frames | Pandas functions, Pandas CSV import, Pandas central tendency                                  | Pandas sort and select, Pandas conversions, data and time, Circular queues                                                   | Hash tables, Hash algorithms and collisions, Graphs, adjacency lists                                                                                                | Recap on representing and handling data                                                     |
| YEAR 13                                 | WEEK 11 - Dec 1 and 2rd Week                                                                                                                                             | WEEK 12 - Jan 1st Week                                                              | WEEK 13 - Jan 2nd Week                                                        | WEEK 14 - Jan 3rd Week                                                                                  | WEEK 15- Jan 4th Week                                                                                   | WEEK 16- Feb 1st Week                                                                                       | WEEK 17- Feb 2nd Week                                                                         | WEEK 18- Feb 3rd Week                                                                                                        | WEEK 19 Feb 4th Week                                                                                                                                                | WEEK 20 - March 1st Week                                                                    |
| TERM 2                                  | TOPIC 19 - BEST PRACTICE                                                                                                                                                 |                                                                                     | TOPIC 20 - ADDITIONAL                                                         |                                                                                                         | TOPIC 20 - ADDITIONAL PROGRAMMING PARADIGMS                                                             |                                                                                                             |                                                                                               |                                                                                                                              | TOPIC 21 - ALGORITHMNS                                                                                                                                              |                                                                                             |
|                                         | Correct outcomes, Good practice, AI code generation, Modularity                                                                                                          | Consistency and readability, Control code behaviour, Testing and debugging          | UML diagrams and OOP theory, Encapsulation                                    | Inheritance, Composition, Aggregation                                                                   | Polymorphism                                                                                            | Linked lists using OOP, Hash tables using OOP, Binary search tree using OOP                                 | Recursive search tree traversal                                                               | Functional programming introduction, First class and higher order functions                                                  | Immutable variables and side effects, Lazy evaluation, Lambda functions                                                                                             | Recursive merge sort, Quick sort                                                            |
| YEAR 13                                 | WEEK 21- March 3rd Week                                                                                                                                                  | WEEK 22- March 4th and 5th and April 1st Week                                       | WEEK 23- April 3rd Week                                                       | WEEK 24 - April 4th Week                                                                                | WEEK 25 April 5th Week                                                                                  | WEEK 26 - May 1st Week                                                                                      | WEEK 27- June 1st Week                                                                        | WEEK 28 - June 3rd Week                                                                                                      | WEEK 29 -June 3rd Week                                                                                                                                              | WEEK 30- June 4th Week                                                                      |
| TERM 2                                  | TOPIC 21 - ALGORITHMNS                                                                                                                                                   | REVISION AND EXAMINATION                                                            |                                                                               |                                                                                                         |                                                                                                         |                                                                                                             |                                                                                               |                                                                                                                              |                                                                                                                                                                     |                                                                                             |
|                                         | Dijkstra's shortest path, RLL encoding                                                                                                                                   | Revision, Mock Examination and Board Examination                                    |                                                                               |                                                                                                         |                                                                                                         |                                                                                                             |                                                                                               |                                                                                                                              |                                                                                                                                                                     |                                                                                             |