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**INFORMATICS 2016 ORIENTATION**

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**Create a database**

**Create and solve a hypothesis using data**

**Present data attractively**

**Protect data and information from threats**

**TIMELINE 2016**

**Lalor Secondary College**

VCE Informatics – Units 3 & 4

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| **Term 1** |  | **Term 3** |
| **Week** | **Topic / Activity** |  | **Week** | **Topic / Activity** |
| 1 | Introduction to Unit 3 |  | 1 | U4O1 – Theory and SAT – check point 2 |
| 2 | U3O2 – Commencement & guidelines for SAT |  | 2 | U4O1 – Theory and SAT |
| 3 | U3O2 – Refine plan for SAT |  | 3 | U4O1 – Theory and SAT – check point 3 |
| 4 | Unit 3 AOS1 – Theory week 1 |  | 4 | U4O1 – Theory and SAT |
| 5 | Unit 3 AOS1 – Theory week 2 / U3O2 check point 1 |  | 5 | U4O1 – Theory and SAT |
| 6 | Unit 3 AOS1 – Theory week 3 |  | 6 | **U4O1 SAT Work Due** |
| 7 | Unit 3 AOS1 – Theory week 4 |  | 7 | Unit 4 AOS 2 – Theory week 1 |
| 8 | Unit 3 AOS1 – Theory week 5 / U3O2 check point 2 |  | 8 | Unit 4 AOS 2 – Theory week 2 |
|  |  | 9 | Unit 4 AOS 2 – Theory week 3 |
|  | 10 | Unit 4 AOS 2 revision & U4O2 SAC |
| **Term 2** |  | **Term 4** |
| **Week** | **Topic / Activity** |  | **Week** | **Topic / Activity** |
| 1 | Unit 3 AOS1 – Theory week 6 |  | 11 | Revision of Unit 3 & 4 for final exam |
| 2 | U3O1 – SAC |  | 12 | Revision of Unit 3 & 4 for final exam |
| 3 | U3O1 – SAC |  | Please note: dates provided for areas of study work and assessment tasks are flexible and are subject to change.Unit 3 AOS1 – Organisations and Data MgtUnit 3 AOS2 – SAT – Drawing ConclusionsUnit 4 AOS1 – SAT – Presenting the findingsUnit 4 AOS2 – Information Management |
| 4 | U3O2 – Theory and SAT – check point 3 |  |
| 5 | U3O2 – Theory and SAT |  |
| 6 | U3O2 – Theory and SAT – check point 4 |  |
| 7 | U3O2 – Theory and SAT |  |
| 8 | U3O2 – Theory and SAT |  |
| 9 | **U3O2 SAT Work Due** |  |
| U4 – 1 | Introduction to Unit 4 – SAT stage 2 |  |
| U4 – 2 | U4O1 – Theory and SAT – check point 1 |  |

**INFORMATICS AREAS OF STUDY – 2016**

**Unit 3 Area of Study 1 Organisations and data management**

Outcome – in plain English:

We will create a solution to a problem by using a database, while also showing how users will interact online by providing data to this solution. **10%**

Key learning for this area of study:

* Investigate why organisations get data online for transaction processing
* Know why organisations create a structure to support transactions
* Know how to use a relational database management system
* Manipulate data sourced online through websites and apps
* Examine how we can add value to data through structures and functions
* Discover the power of queries, searches and reports to create information
* Know how to identify patterns and relationships between data sets
* Work out what different types of data are acquired online
* Understand how data is obtained and protected
* See data being used to complete transactions
* Design user flow diagrams tracing how users interact with a solution
* Examine how organisations protect users legal rights
* Realise the need for data to be organised for efficient use
* Understand how different data sets relate to each other
* Respond to two different types of design brief – user/RDBMS solution

In this area of study there is an emphasis on the **design and development** stages of the problem-solving methodology. We will also need to apply **design** and **systems** thinking skills when **problem solving**.

**INFORMATICS AREAS OF STUDY – 2016**

**Unit 3 Area of Study 2 Data analytics – drawing conclusions**

Outcome – in plain English:

We will use various methods to obtain, prepare, manipulate and interpret complex data to confirm or refute a hypothesis we create, while following a project plan to track our progress. **Forms part of SAT (30%)**

Key learning for this area of study:

* Focus on data analytics: selecting, referencing, organising, manipulating and interpreting relevant data to draw valid conclusions about a hypothesis
* Create a hypothesis within personally chosen field (entertainment, sport, science/medicine, business or education)
* Start an analysis to determine the data sets needed to support the claim
* Identify and clarify the scope and constraints of the hypothesis
* Preparing acquired data for manipulation through integrity checks
* Know what it means to codify data and information
* Manipulate data to allow for easier and clearer interpretation
* Apply computational thinking skills to extract meaning from the data
* Express clearly a conclusion to the hypothesis
* Create a file management and project plan for the execution of the project
* Determine appropriate project milestones

There are **two parts to this project**: creating a hypothesis, including analysis and the conclusion (Unit 3, Outcome 2) through to the design, development and evaluation of a multimodal online solution showing the correctness (or otherwise) of the hypothesis (Unit 4, Outcome 1).

**INFORMATICS AREAS OF STUDY – 2016**

**Unit 4 Area of Study 1 Data analytics – presenting findings**

Outcome – in plain English:

We will design, develop and evaluate an online solution that either confirms or rejects our hypothesis, and assess the effectiveness of our project plan in managing progress. **Forms part of SAT (30%)**

Key learning for this area of study:

* Draw on the conclusion formed to our hypothesis in U3O2
* Design and develop an online solution that communicates this conclusion
* Evaluate the effectiveness of the solution in communicating the conclusion
* Understand effective design and the clarity of message as being key to a solution that is communicating conclusions and findings from complex data sets
* Design an online solution aiming to educate a world-wide audience
* Generate two or three alternative design ideas and develop and apply criteria to select the design idea that will be fully detailed and transformed into a solution.
* Use software tools and functions that support the types of data being manipulated to transform the design into a solution.
* Use and develop a set of criteria to evaluate the effectiveness of their solution in presenting the conclusion and findings
* Use a project plan to monitor and record progress and assess the effectiveness of this strategy in managing the project.

There are **two parts to this project**: creating a hypothesis, including analysis and the conclusion (Unit 3, Outcome 2) through to the design, development and evaluation of a multimodal online solution showing the correctness (or otherwise) of the hypothesis (Unit 4, Outcome 1).

**INFORMATICS AREAS OF STUDY – 2016**

**Unit 4 Area of Study 2 Information management**

Outcome – in plain English:

We will compare the effectiveness of information management strategies used by two organisations to manage the storage and disposal of data and information and recommend improvements to current practice. **10%**

Key learning for this area of study:

* Develop knowledge about the components of an information system and the role of these components in managing information
* Investigate how different organisations store and dispose of data and information
* Examine the threats to this data and information, whether accidental, deliberate or technical, and consider the consequences to organisations of ineffective information management strategies
* Recommend information management strategies to protect the integrity and security of data and information, taking into account key legal requirements of organisations
* Understand and take into consideration and ethical dilemmas faced by organisations and individuals regarding security of information.

**I’m-IN for 2016 studies**

**Join Edmodo group** Passcode: hz7bi9

Edmodo and Compass will be the key channels of communication for any information related to Informatics 2016.

**Create folder structure**

Within your school network drive, create a folder structure for this year’s studies:

Informatics 2016

 01 – Course Information

 02 – Unit 3 Outcome 1

 01 – Class Materials

 02 – Theory Questions

 03 – Project Work

 04 – SAC U3O1

 03 – SAT

 01 – Unit 3 Outcome 2

 01 – Class Materials

 02 – Theory Questions

 03 – Project Work

 02 – Unit 4 Outcome 1

 01 – Class Materials

 02 – Theory Questions

 03 – Project Work

 03 – Project Management

04 – Unit 4 Outcome 2

 01 – Class Materials

 02 – Theory Questions

 03 – Project Work

 04 – SAC U4O2

 05 – Exam

 01 – Exam Preparation Questions

 02 – Summarised Notes

**Holiday homework**

1 – Get an understanding of the key areas of knowledge and how to find answers in the Nelson/Cengage textbook. Summarise the information contained in the textbook from page 3 to 10. For every **RED** word provide a definition (you may find this in the index at the back of the book). Your summary should be structured in the following way:

* Why organisations acquire data using online facilities
* Why users supply data for online transactions (broken down into 3 sub points)
* Techniques used by organisations to acquire data online

2 – Create a **step by step** account for a users’ perspective when placing an online order on Rebel Sport.  Feel free to “purchase” any product.  Go through the process right up until you enter credit card details.

<http://www.rebelsport.com.au>

* Requires knowledge of how to use a graphic organiser, such as a flowchart or table in Word
* Should include screen shots / use of snipping tool or documenting process through video (SnagIT extension to Google Chrome)

3 – Complete **SQL Basics and More Advanced SQL** course on **Khan Academy**

<https://www.khanacademy.org/computing/computer-programming/sql>

* Create a Khan Academy account (if not already)
* To join this class, click your username at the top right, choose "Profile," and go to profile's "Coaches" tab. Enter the class code Q3J8W8 under "Add a coach."

4 – Come to the first lesson of 2016 with **10 songs that you** **legally own** on a USB

* Emphasis on legally owned – if not owned then I will purchase a random $1 CD from JB Hifi which most likely won’t be to your musical tastes
* Ensure these tracks are motivational/feel good tracks to inspire us during the year
* No swearing, nothing “Not Safe for School” (design principle of appropriateness)

**How do these tasks relate to the Unit’s work?**

1 – To understand the content, some information will need to be gleaned from the textbook. Class time needs to be focused on practical tasks as much as theory, so studies can be deepened with textbook reading and summarising.

2 – We need to understand the user’s role when they interact with online systems – this will lead to our learning about **User Flow Diagrams**

3 – Knowing about how SQL and queries work will make **studying and creating relational database management systems (RDBMS)** a lot easier

4 – Gathering this information is a key part of the first assessment task that we will undertake as a class: **creating a music database** (most likely in MS Access)

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| **Unit 3 Outcome 1 – Organisations and data management**On completion of this unit the student should be able design a solution, develop it using a relational database management system (RDBMS) and diagrammatically represent how users interact with an online solution when supplying data for a transaction. |
| **Key Knowledge** |
| **Data and information** | **Interactions and impact** | **Approaches to problem solving** |
| **1** techniques used by organisations to acquire data through interactive online solutions & reasons for their choice | **1** reasons why organisations acquire data using online facilities – 24-hr access, direct data entry, global markets | **1** purpose and structure of an RDBMS – comparison with flat files | **2** naming conventions for RDBMS use / maintenance |
| **2** techniques for efficient and effective data collection  | **2** reasons why users supply data for online transactions | **3** methodology for creating an RDBMS structure | **4** design tools for describing data types and entity relationship diagrams for RDBMS structure |
| **3** characteristics of data types | **3** techniques used by organisations to protect the rights of individuals and organisations who supply data – security protocols and policies | **5** design principles – functionality and appearance | **6** design tools for representing solutions |
| **Digital systems** | **4** user flow diagrams depicting different ways in which users interact with online solutions | **7** functions and techniques within RDBMS to validate and manipulate data | **8** functions and techniques to retrieve information through sorting, filtering, querying data sets |
| **1** physical and software security controls used by organisations to protect their data |  | **9** methods and techniques for testing solutions perform as intended |  |
| **Key Skills** |
| **1** select and apply design tools & techniques for describing data types, representing structure and functionality of solutions | **2** use RDBMS functions and techniques to construct a relational database to manipulate and validate data | **3** apply functions and techniques to construct queries to efficiently retrieve information |
| **4** select and apply testing methods & techniques to confirm if solutions operate as intended | **5** use software tools to represent the user interface of the page on which online transactions begin, including data protection | **6** use software tools to represent interactions between users and online solutions (user flow diagrams) |
| **7** annotate user flow diagrams to identify where and why data protection is used |  |  |

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| **Unit 3 Outcome 2 – Data analytics: drawing conclusions**On completion of this unit the student should be able to use a range of appropriate techniques and processes to acquire, prepare, manipulate and interpret complex data to confirm or refute a hypothesis, and formulate a project plan to manage progress. |
| **Key Knowledge** |
| **Data and information** | **Interactions and impact** | **Approaches to problem solving** |
| **1** primary and secondary data sources (digital / non digital) and methods of data acquisition | **1** key legal requirements for storage and communication of data and information including privacy, intellectual property and human rights requirements | **1** features of a reasonable hypothesis including a specific statement identifying a prediction and the variables |
| **2** suitability of quantitative and qualitative data for manipulation including comparisons / policy formation | **2** solution specifications: requirements, including data to support the prediction of the hypothesis, constraints and scope |
| **3** data types and data structures relevant to selected software tools | **3** project management concepts and processes, including milestones and dependencies (concepts), task identification, sequencing, time allocation, resources and documentation using Gantt charts (processes) |
| **4** referencing primary and secondary sources (Harvard / APA / Chicago / IEEE) | **Digital systems** | **4** file naming conventions to support efficient use of software tools |
| **5** criteria to check the integrity of data including timeliness, authenticity, relevance, accuracy | **1** roles, functions and characteristics of digital system components used to input, store, communicate and output data/information | **5** software functions to organise, manipulate and store data |
| **6** techniques for coding qualitative data to support manipulation | **2** physical and software security controls suitable for protecting stored and communicated data | **6** techniques for identifying patterns and relationships between data |
| **Key Skills** |
| **1** frame a hypothesis that can be tested | **2** determine the specifications of the solution | **3** acquire complex data sets and use standard referencing system to acknowledge IP |
| **4** apply techniques that discriminate data on the basis of its integrity | **5** select and apply methods to secure stored and communicated data and information | **6** organise, manipulated and interpret selected data, identifying relationships and patterns to develop conclusion |
| **7** devise and apply file management plan | **8** prepare project plans using software | **9** select and use digital system components appropriate to project needs |

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| **Unit 4 Outcome 1 – Data analytics: presenting the findings**On completion of this unit the student should be able to design, develop and evaluate a multimodal online solution that confirms or refutes a hypothesis, and assess the effectiveness of the project plan in managing progress. |
| **Key Knowledge** |
| **Approaches to problem solving** |
| **1** characteristics of information for educating world-wide audiences, including gender/culture inclusiveness, commonality of language, age appropriateness |
| **2** techniques for generating design ideas | **3** criteria for evaluating alternative design ideas and effectiveness of solutions | **4** characteristics of effective multimodal online solutions |
| **5** formats and conventions appropriate to multimodal online solutions | **6** design principles that influence the functionality and appearance of multimodal online solutions | **7** design tools for representing a solution’s appearance and functionality, including relationships as needed |
| **8** functions, techniques, procedures for efficiently / effectively manipulating data using software tools | **9** manual and electronic validation techniques | **10** functions, techniques and procedures for managing files |
| **11** techniques for testing that solutions do what is intended | **12** techniques for documenting the progress of projects, including animations, logs and adjustments to tasks and timeframes | **13** strategies for evaluating the effectiveness of solutions and assessing project plans |
| **Key Skills** |
| **1** generate alternative design ideas | **2** select preferred design ideas, based on student-developed criteria | **3** select and apply design tools to represent the functionality and appearance of solutions |
| **4** select and apply software functions, methods, formats, conventions, techniques and design principles to develop multimodal online solutions that operate as intended |
| **5** monitor and adjust project plans where appropriate | **6** apply criteria to evaluate the effectiveness of multimodal online solutions in communicating conclusions to hypotheses | **7** assess the effectiveness of project plans in managing work practices |

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| **Unit 4 Outcome 2 – Information management**On completion of this unit the student should be able to compare and contrast the effectiveness of information management strategies used by two organisations to manage the storage and disposal of data and information and recommend improvements to their current practices. |
| **Key Knowledge** |
| **Interactions and impact** | **Digital systems** |
| **1** reasons why data / information are important to organisations, including meeting goals/objectives of both organisations and information systems | **2** reasons why information management strategies are important to organisations including maximising opportunities, minimising risks and fulfilling legal requirements | **1** role of people, processes and digital systems in the management of data and information |
| **3** key legislation that affects how organisations control storage / disposal of their data / information – *Privacy Act 1988, Privacy and Data Protection Act 2014, Health Records Act 2001* | **4** ethical dilemmas arising from information management practices | **2** types and causes of accidental, deliberate and events-based threats to the integrity and security of data and information |
| **6** strategies for resolving legal and ethical tensions between stakeholders arising from information management practices | **6** reasons for preparing disaster recovery plans, and the scope of these plans: evacuation, backing up, restoration, test plans | **3** physical/software security controls for preventing unauthorised access to data / information and minimise loss of data accessed by authorised / unauthorised users |
| **7** possible consequences for organisations that fail to follow or violate security measures | **8** criteria for evaluating the effectiveness of information management strategies | **4** advantages/disadvantages of using networks/cloud computing for storing and disposing of data/information |
| **Key Skills** |
| **1** explain current information management strategies used by organisations to monitor and control their data / information | **2** identify similarities / differences between information management strategies of organisations | **3** propose and apply criteria to evaluate effectiveness of information management strategies |
| **4** discuss consequences of ineffective information management strategies | **5** recommend information management strategies to improve current practices |  |

**Jump-IN**

**For those who didn’t do IT Unit 1 and 2 or for those who need practice: (last year’s Outcomes in brackets)**

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| **NO.** | **TOPIC / KEY KNOWLEDGE AREA** | **OUTCOMES – INFO TECH UNIT 1&2 2015** | **OUTCOMES – INFORMATICS 2016** |
| 1 | The PSM | All | All |
| 2 | Design tools | All | All |
| 3 | Design principles | U2O3 | U3O1 and U4O1 |
| 4 | Project management | U2O3 | U3O2 and U4O1 |
| 5 | Excel basics | U1O1 | U3O2 |
| 6 | Data analytics | U2O1 | U3O2 |
| 7 | Data to information through visualisation | U1O1 and U2O1 | U3O2 |
| 8 | Building websites with HTML / CSS / Adobe Dreamweaver CS5 | U1O3 and U2O3 | U4O1 |
| 9 | Networks – advantages and disadvantages | U1O2 | U4O2 |
| 10 | Understanding what “the Cloud” is | U1O3 | U4O2 |