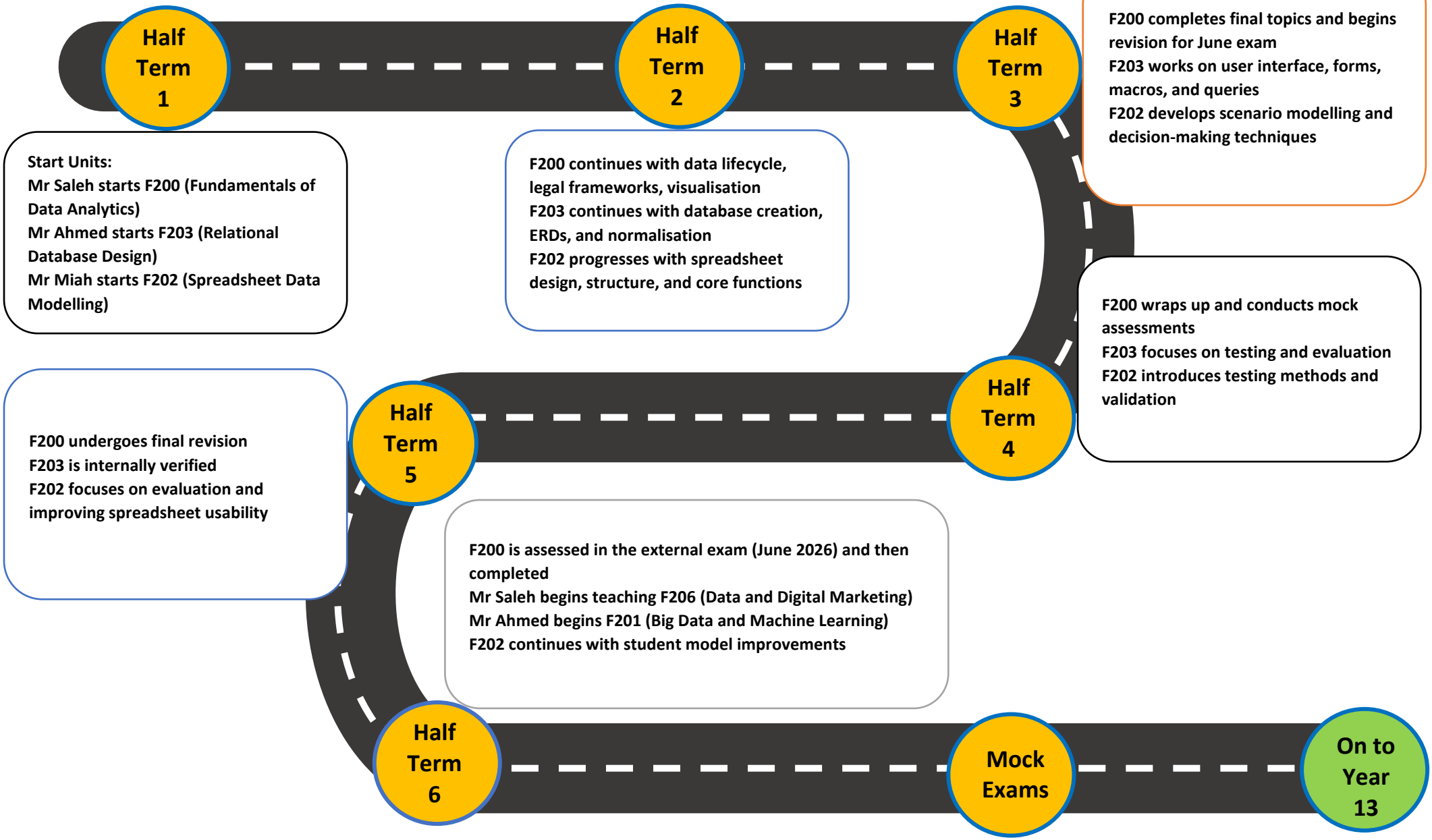
Eastbrook Sixth Form

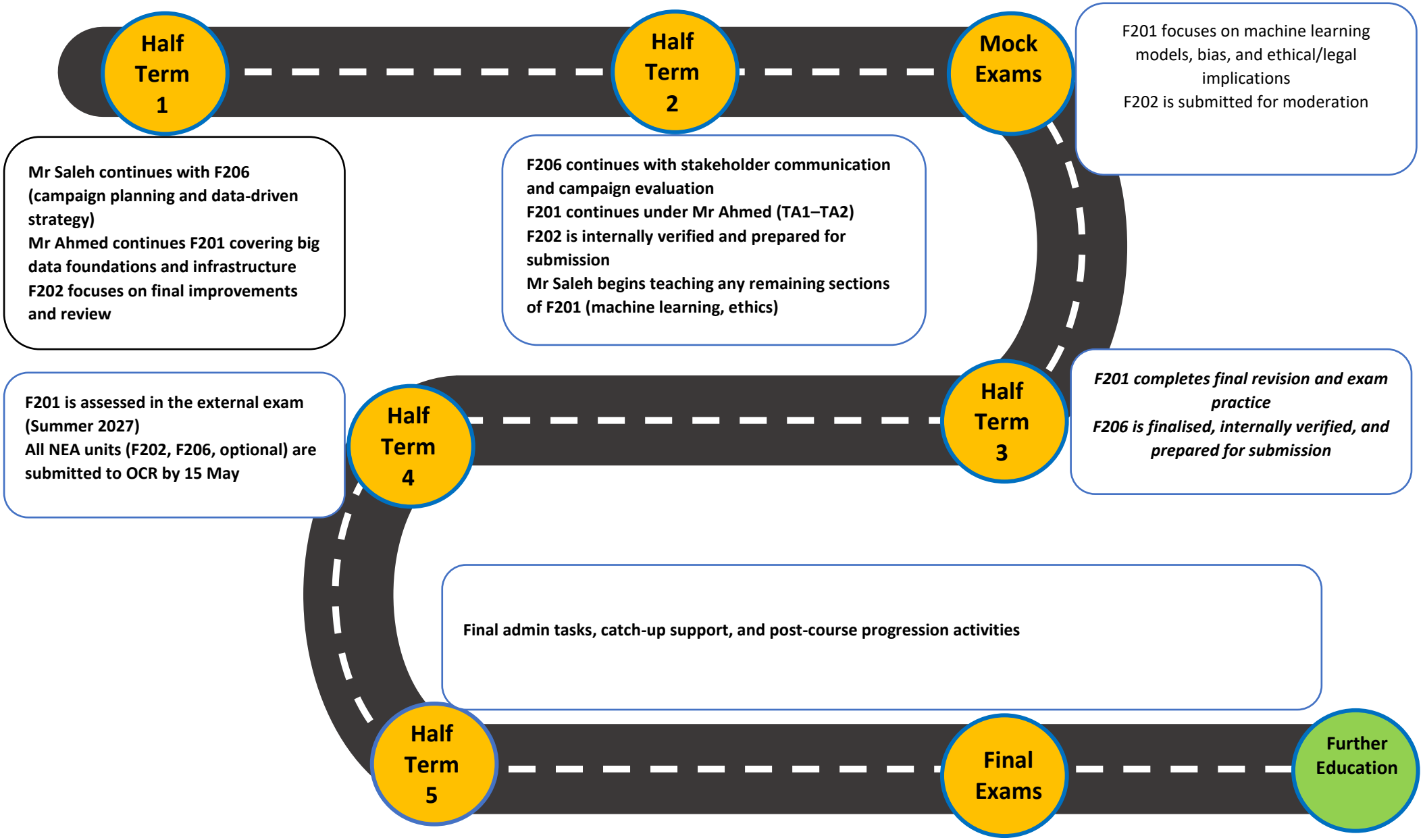
Independent Study Guide

IT

Year 12 IT ROADMAP



Year 13 IT ROADMAP



F200 – Fundamentals of Data Analytics: Understanding and Managing Data in the Digital Age

Summary

This unit provides foundational knowledge and understanding of how data is collected, managed, analysed, and protected. Students will explore data formats, lifecycle management, storage, analysis, visualisation, legal considerations, and job roles in the data analytics sector. The unit develops skills in identifying how data can be used responsibly and effectively in real-world scenarios.

Assessment Objectives

- Understand the characteristics, formats, and types of data.
- Examine data lifecycle management and the analytics pipeline.
- Recognise legal and ethical implications of working with data.
- Apply knowledge of data presentation and visualisation methods.
- Identify and evaluate roles within the data analytics profession.

Required Reading List

- OCR Level 3 Cambridge Advanced National in IT: Data Analytics Specification – Unit F200.
- OCR Assessment Material for Unit F200.

Additional Reading List

- "Big Data Fundamentals" – IBM SkillsBuild.
- "Introduction to Data Analytics" – FutureLearn / Coursera.
- "Data Literacy: What Every Professional Needs to Know" – Wiley.

Self-Study Questions Each question below should take at least one hour to complete and can be tackled independently:

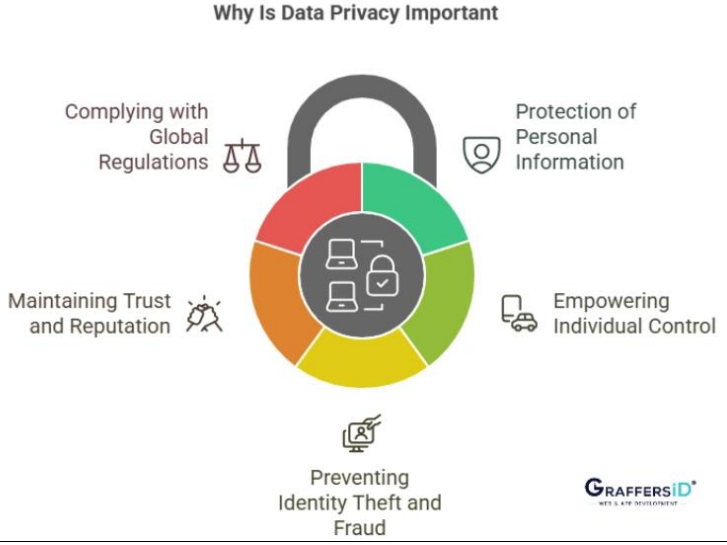
1. Define data, information, and knowledge. Then outline the five stages of the data lifecycle, using a school or retail example to show how data becomes useful knowledge.
2. Describe how the data analytics pipeline transforms raw data into visual outputs. Compare structured, semi-structured, and unstructured data, including examples of how each type is used in business or technology.
3. Evaluate data visualisation methods like charts and dashboards. Explain how user access controls help protect shared data and why setting different access levels is important in organisations.
4. Summarise key UK GDPR requirements and the role of the ICO. Explain what organisations must do to comply and what could happen if personal data is misused.
5. Identify three data analytics job roles. For each, describe the main responsibilities and skills required, and explain how the role supports effective data handling and decision-making in businesses.

What the mark scheme says?

Pass: **Show knowledge and understanding**
Demonstrate accurate knowledge of data types, lifecycle stages, formats, and legal considerations relevant to data analytics within real-world contexts.

Merit: **Apply knowledge and understanding**
Use your understanding of data analytics concepts to explain how data is collected, managed, visualised, and securely shared across platforms.

Distinction: **Analyse and evaluate knowledge, understanding and performance**
Assess the effectiveness of data handling, storage, and visualisation techniques, identifying strengths, weaknesses, and opportunities for improvement in practical data scenarios.



Where this term links with Career Prospects
This unit lays the groundwork for roles such as Data Analyst, Business Intelligence Developer & Data Engineer. It also supports progression to higher education in subjects like Computer Science, Data Science, and Cybersecurity.

Top Tip from the Department
Learn by doing: Use free tools like Google Sheets to explore how different data formats can be used. Try creating visualisations from real-world datasets (e.g., government statistics or sports data).

F201 – Big Data and Machine Learning: Exploring Data at Scale and Using Predictive Tools

Summary

This unit introduces learners to the principles and practices behind big data and machine learning. Students will explore the characteristics of big data, the technological infrastructure needed to manage it, and how machine learning can be applied to extract value. The unit combines theoretical understanding with real-world application, encouraging students to investigate data sources, examine ethical implications, and understand the growing impact of machine learning in business, science, and society.

Assessment Objectives

Demonstrate clear comprehension of factual concepts, such as features of big data, infrastructure components, types of machine learning, data protection laws, etc. Use your understanding within context—for example, explaining benefits of machine learning for a retailer, or applying GDPR principles to a data-gathering scenario. Go beyond description and application to analyse scenarios, evaluate pros/cons, compare techniques, and make justified recommendations. Typical questions involve clustered analysis discussions or ethics evaluations.

Required Reading List

- OCR Level 3 Cambridge Advanced National in IT: Data Analytics Specification – Unit F203.
- OCR Assessment Material for Unit F203: Relational Database Design.

Additional Reading List

- IBM and Microsoft ML/AI case studies and blogs.
- FreeCodeCamp and Coursera beginner tutorials on machine learning and big data.

Self-Study Questions Each question below should take at least one hour to complete and can be tackled independently:

1. Choose a real-world example (e.g. Amazon, NHS, or Transport for London) and explain how big data is collected, processed, and analysed in that organisation.
2. Investigate a current use of machine learning (e.g. chatbots, fraud detection, or recommendation engines). What type of machine learning is used, and how is it trained?
3. What ethical issues can arise from using machine learning on large datasets? Provide real-world examples and how they were addressed.
4. Compare supervised and unsupervised learning. Provide an example of each and explain the type of data required and the outcomes produced.
5. Investigate a recent case where bias in machine learning led to negative consequences (e.g. in hiring, facial recognition, or healthcare). What caused the bias, and how could it be reduced or prevented?

What the mark scheme says?

Pass: Describe the features and challenges of big data. Identify technologies used to collect, store, and analyse large datasets. Provide examples of where machine learning is applied. Recognise basic ethical concerns..

Merit: Explain the role of infrastructure in managing big data. Compare different types of machine learning and their use cases. Analyse the benefits and limitations of using machine learning on big data. Discuss ethical and environmental implications in more detail.

Distinction: Evaluate case studies showing effective (or flawed) uses of ML on big data. Justify technology choices based on real-world business or societal needs. Propose improvements or alternative approaches. Assess the long-term impact of AI-driven systems.

Where this term links with Career Prospects

Skills gained in this unit support pathways into careers in data science, artificial intelligence, business analytics, software engineering, and cyber security. Knowledge of machine learning models and big data frameworks is especially valuable in roles such as Data Analyst, AI Research Assistant, Business Intelligence Consultant, and Cloud Infrastructure Engineer.

Top Tip from the Department

Don't be intimidated by the size or complexity of "big data." Focus on understanding how and why organisations use it, and explore tools like Google Colab, Power BI, or Tableau to practise handling and visualising large datasets. Remember: machine learning isn't magic — it's statistics, code, and critical thinking.

F202 – Spreadsheet Data Modelling: Building Practical Financial Models for Real-World Decision Making

Summary

This unit focuses on the principles of data modelling using spreadsheets. Students will learn to plan, design, create, test, and review spreadsheet models that meet specific client needs. The unit emphasizes the development of practical skills in spreadsheet software, enabling students to manipulate data effectively and support decision-making processes.

Assessment Objectives

Understand the purpose and principles of data modelling.
Develop the ability to design and implement spreadsheet models.
Demonstrate skills in testing and evaluating spreadsheet solutions.
Apply knowledge to solve problems and make informed decisions based on data.

Required Reading List

OCR Level 3 Cambridge Advanced National in IT: Data Analytics Specification – Unit F202.
OCR Assessment Material for Unit F202: Spreadsheet Data Modelling.

Additional Reading List

"Excel for Data Analysis" – Microsoft Learn.
"Data Modeling in Excel" – Udemy Course.
"Introduction to Spreadsheets and Models" – Coursera

Self-Study Questions Each question below should take at least one hour to complete and can be tackled independently: *You have been approached by ExcelFit, a growing fitness studio that wants to better manage its class bookings, trainer availability, and monthly revenue using a spreadsheet model. They aim to make data-driven decisions to optimise staffing and increase profits.*

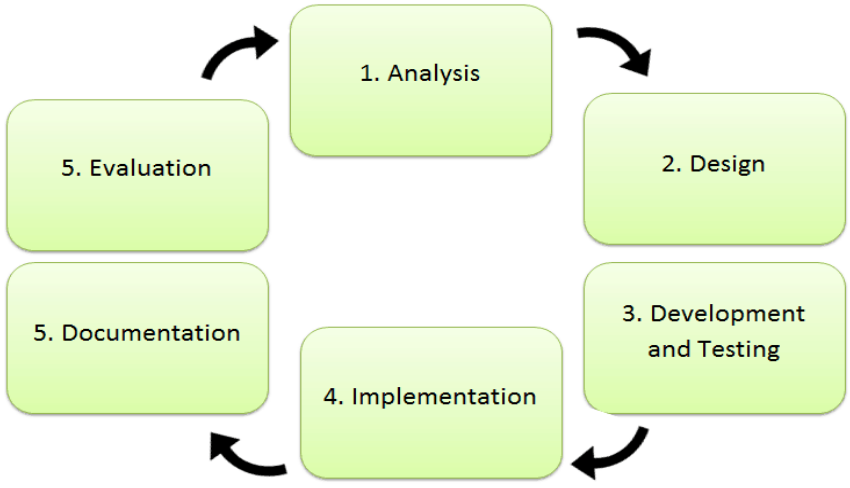
1. Create a plan for how you would approach building a spreadsheet model for ExcelFit. Include the stages of development (planning, design, implementation, testing, evaluation) and describe the purpose of each.
2. Design a spreadsheet that tracks class bookings, calculates revenue per class, and predicts monthly earnings. Use functions such as `IF`, `VLOOKUP`, `COUNTIF`, `SUMIF`, and conditional formatting. Explain how each function supports decision-making.
3. Describe how you would test ExcelFit's booking spreadsheet to ensure data accuracy. Create a testing table with examples of normal, abnormal, and boundary data. Explain the importance of validation rules in this context.
4. Build or describe a scenario model that compares different pricing structures (e.g. £5, £7, £10 per session) and predicts how these changes would impact revenue. Use data tables or "what-if" tools and explain the outcome of each scenario.
5. Assume you presented your model to ExcelFit, and they requested improvements. How would you gather feedback, and what criteria would you use to evaluate your model's effectiveness (usability, accuracy, presentation, performance)?

What the mark scheme says?

Pass: Demonstrates basic understanding and application of spreadsheet modelling techniques with limited analysis.

Merit: Shows clear understanding and competent application of techniques, with some analysis and evaluation.

Distinction: Exhibits comprehensive understanding, proficient application, and insightful analysis and evaluation of spreadsheet models.



Where this term links with Career Prospects

Skills developed in this unit are directly applicable to careers in data analysis, finance, business intelligence, and IT. Proficiency in spreadsheet modelling is essential for roles such as Data Analyst, Financial Analyst, and Business Consultant.

Top Tip from the Department

Practice is key. Regularly engage with real-world data sets to refine your modelling skills. Utilize online platforms like Excel Practice Online and Excel Exercises to enhance your proficiency.

F203 – Relational Database: Building Databases for Real-World Data Handling.

Summary

This unit focuses on the principles of relational database design. Students will learn how to plan, design, implement, test, and evaluate relational database systems that meet specific client needs. The unit emphasises practical database development, enabling learners to work with multiple related tables, apply normalisation techniques, construct advanced queries, and create usable forms and reports. This aligns with OCR Unit F203 from the Level 3 Cambridge Advanced Nationals in IT: Data Analytics pathway.

Assessment Objectives

Understand the purpose and benefits of relational databases.
Develop the ability to design and construct database structures using ERDs and data dictionaries.
Demonstrate skills in normalisation to 3NF.
Create queries, forms, sub forms, and reports tailored to user requirements.
Apply testing and validation techniques to ensure functionality and reliability.
Evaluate database effectiveness in relation to user needs and feedback.

Required Reading List

- OCR Level 3 Cambridge Advanced National in IT: Data Analytics Specification – Unit F203.
- OCR Assessment Material for Unit F203: Relational Database Design.

Additional Reading List

"Database Design for Mere Mortals" – Michael J. Hernandez.
"SQL Queries for Mere Mortals" – John L. Viescas and Michael J. Hernandez.
W3Schools SQL and Access tutorials.

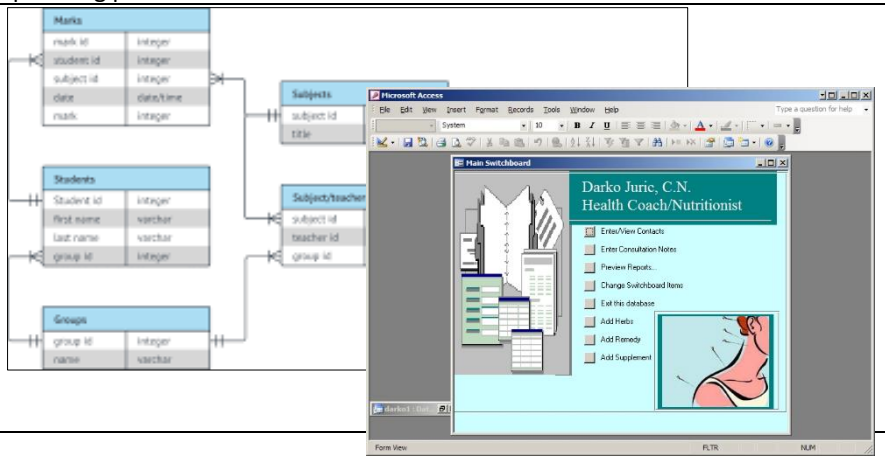
Self-Study Questions Each question below should take at least one hour to complete and can be tackled independently: The owner of Westwood Data Management wants a relational database to record staff performance data. The database will provide easy access to data about staff performance.

1. Research the processes involved in planning and developing a relational database. Identify the advantages of working with relational databases as opposed to flat file databases.
2. Create a plan for how you would approach building a Relational Database for Westwood Data Management. Create an entity relationship diagram (ERD), Normalise the database to third normal form (3NF), Create a data dictionary for the solution. Justify the use of the chosen validation methods for the database solution. **Design** the macros required for the solution to work effectively.
3. Create the database solution using the planning; Create the database structure and populate with data. Create complex queries required for the solution. Create outputs required for the solution. Create the macros required for the solution to work effectively.
4. Describe how you would test *Westwood Data Management's* performance database to ensure data accuracy. Create a testing table with examples of normal, abnormal, and boundary data. Explain the importance of validation rules in this context.
5. Evaluate the database solution you created for the owner of Westwood Data Management and the planning processes you followed. Evaluate the planning processes followed and suggest improvements that could be made for a similar project in the future.

What the mark scheme says?
Pass: Create an entity relationship diagram (ERD), Normalise the database to third normal form (3NF), Create a data dictionary for the solution, Design and create the forms to be used for the solution, Describe, design and create simple queries, Design and create the switchboard and navigation, Test the database solution against the database requirements.

Merit: Identify input masks and other methods to validate the data. Describe complex queries, Design outputs to be used for the solution. Create complex queries. Create outputs required for the solution. Analyse the test outcomes and, if necessary, resolve any errors. Explain how the database solution meets the client's requirements.

Distinction: Justify the use of the chosen validation methods. Design and create the macros required. Evaluate how successful the solution. Evaluate the planning processes.



Where this term links with Career Prospects
Skills developed in this unit are directly applicable to careers in data management, database administration, software development, and business intelligence. Proficiency in relational databases is critical for roles such as Data Analyst, Database Developer, Systems Analyst, and IT Consultant.

Top Tip from the Department
Don't just build a working database — think like the end user. Design your system for clarity, efficiency, and scalability. Use Microsoft Access, SQL-based tools, or any relational DBMS to practise building real-world systems from start to finish.

F206 – Data and Digital Marketing

Summary

This unit explores how data is used to plan, create, deliver, and evaluate digital marketing campaigns. Students will learn to design content, select platforms, analyse effectiveness, and present outcomes. Through hands-on tasks, they will develop digital literacy and communication skills relevant to marketing roles, improving their ability to engage audiences and meet client needs.

Assessment Objectives

- Understand the core principles and tools of digital marketing.
- Understand the use data to inform content creation, targeting & campaigns.
- Apply digital marketing strategies to meet specific client requirements and campaign goals.
- Evaluate campaign effectiveness using metrics, feedback, and data.
- Develop professional documentation and presentation skills for marketing.

Required Reading List

OCR Level 3 Cambridge Advanced National in IT: Data Analytics Specification – Unit F206
OCR Assessment Material for Unit F206

Additional Reading List

Digital Marketing For Dummies by Ryan Deiss and Russ Henneberry
Understanding Digital Marketing by Damian Ryan (Kogan Page)
Google Digital Garage: Fundamentals of Digital Marketing (Free certification)

Self-Study Questions Each question below should take at least one hour to complete and can be tackled independently:

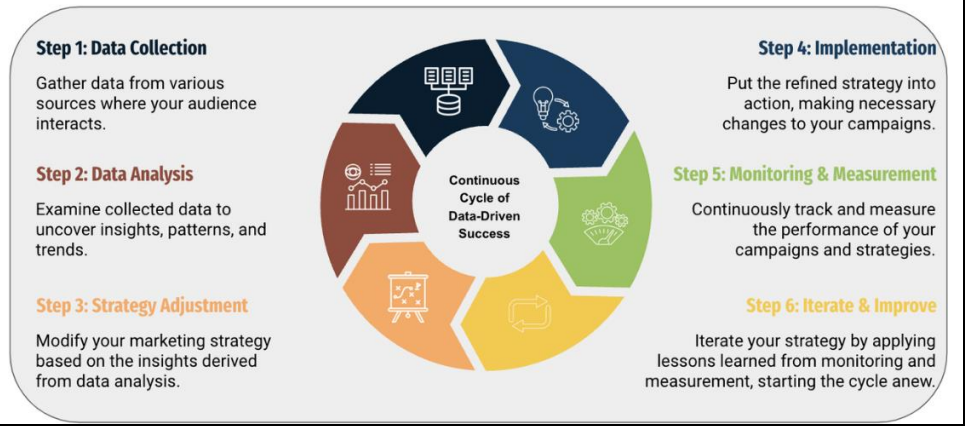
1. Describe the purposes of digital marketing, and explain how approaches differ between business-to-business (B2B) and business-to-consumer (B2C) campaigns, using real-world platform examples to support your answer.
2. Explain how data is used to plan digital marketing campaigns. Include segmentation, persona creation, and customer goals to show how insights support targeting throughout the campaign lifecycle.
3. Evaluate the effectiveness of two digital marketing tools, such as social media or pay-per-click, and explain how data influences the choice of tool for different audiences.
4. Create an outline for a digital marketing campaign using real data. Identify tools, audience goals, key messages, and performance indicators used to measure success.
5. Discuss the ethical and legal considerations when collecting and using data for digital marketing, including issues around consent, privacy, and targeted advertising.

What the mark scheme says?

Pass: **Show knowledge and understanding**
Demonstrate basic understanding of digital marketing tools, campaign planning processes, and the use of data to meet user needs.

Merit: **Apply knowledge and understanding**
Explain campaign choices, assess audience impact, and reflect on how your digital marketing approach could be improved in future scenarios.

Distinction: **Analyse and evaluate knowledge, understanding and performance**
Assess the effectiveness of data handling, storage, and visualisation techniques, identifying strengths, weaknesses, and opportunities for improvement in practical data scenarios.



Where this term links with Career Prospects
This unit develops practical skills for roles such as Digital Marketing Assistant, Campaign Analyst, SEO Specialist, Social Media Coordinator, and Marketing Executive. It also supports entry to university courses in Marketing, Business, Media, or Data Analytics, where understanding consumer data and digital platforms is essential.

Top Tip from the Department
Practice building campaigns using free tools like Mailchimp and Google Ads. Apply real data sets to test your designs and always think from your audience's point of view—what would make you click?