

**Scheme of Work 2020-2021**  
**Subject: Information Technology**

**Year Group: 12**

**Specification: BTEC Level 3 Information Technology – Unit 2 - Creating Systems to Manage Information**

Lesson No	Topic & Objectives	Big Question – What will students learn?	Key Activities & Specialist Terminology (Do Now Task / Starter/Tasks/Plenary)	Planned Assessment	Homework or flipped learning resources <b>DODDLE resources</b>	Lit Num SMSC Codes
3/9/20	<b>A1 Relational database management systems</b>	<b>What are the different types of relational database management systems?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Introduce learners to the unit and to topic A.</li> <li>• <b>Tutor-led discussion:</b> Thought shower: where are databases used? Types of relational database management systems. <b>Tutor presentation:</b> The purpose of a database, a database management system (DBMS) and an overview of relational DBMS, their use and support. See link: What is a Database Management System? Purpose and Function in the following link <a href="http://study.com/academy/lesson/what-is-a-database-management-system-purpose-and-function.html">http://study.com/academy/lesson/what-is-a-database-management-system-purpose-and-function.html</a></li> <li>• <b>Small-group activity:</b> Learners review a case study to identify which data needs to be stored and how the data would need to be used.</li> <li>• <b>Plenary:</b> Share feedback on the group activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>		Revision workbook  Revision Guide page 48	Lit  Social  So8 C3 Sp2 Sp5
7/9/20	<b>A1 Relational database management systems</b>	<b>What are relationships?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, discuss real life example of related</li> </ul>		Revision workbook  Revision Guide page 48 and 49	Lit  Social

	Relational data structures.		<p>data (e.g. tutor/class, football league/teams).</p> <ul style="list-style-type: none"> <li>• <b>Tutor presentation:</b> database relations, including entity relationship, generic and semantic and relational data structures including relation, attribute, domain, tuple, degree, cardinality, relational database and the more common names for each, e.g. relation and table. See link on database relationships in the resources column.</li> </ul> <p><b>Small-group activity:</b> Learners investigate various examples of data and discuss relationships between data items and how they might be organised. See link on Microsoft Access Data Types in the following links  <a href="http://www.techrepublic.com/article/relational-databases-defining-relationships-between-database-tables/">www.techrepublic.com/article/relational-databases-defining-relationships-between-database-tables/</a></p> <ul style="list-style-type: none"> <li>• Link for activity:  <a href="http://www.w3schools.com/sql/sql_datatypes.asp">www.w3schools.com/sql/sql_datatypes.asp</a></li> <li>• <b>Individual practical exercise:</b> Learners create a table in an RDBMS and populate it with several records then create a related table.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>			So8 C3 Sp2 Sp5
14/9/20	<p><b>A1 Relational database management systems</b> Relational keys.</p>	<p><b>What are keys in Microsoft Access?</b></p>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, discuss how to find data. What is a key, what makes a good key?</li> </ul> <p><b>Tutor presentation:</b> Relational keys, including primary keys, candidate keys, super keys and</p>		<p>Revision workbook</p> <p>Revision Guide Page 48 and 49</p>	<p>Lit</p> <p>Social</p> <p>So8 C3</p>

			<p>foreign keys. See link on types of keys in a relational database in the following link  <a href="http://databasemanagement.wikia.com/wiki/Relational_Database:_Keys">http://databasemanagement.wikia.com/wiki/Relational Database: Keys</a></p> <ul style="list-style-type: none"> <li>• <b>Tutor-led discussion:</b> The development cycle, creating tables and selecting keys.</li> <li>• <b>Individual practical exercise:</b> Learners to create two or more tables, select primary keys and foreign keys to create a relationship between tables.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>			Sp2 Sp5
21/9/20	<p><b>A1 Relational database management systems</b> Entity relationships and integrity constraints.</p>	<p><b>What is data integrity?</b></p>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, discuss data integrity. What is it, why is it important?</li> <li>• <b>Tutor presentation:</b> Entity relationships, including how to resolve one-to-one and one-to-many relationships and integrity. See the link: Resolve your many-to-many for accurate requirements in the following link  <a href="http://www.captechconsulting.com/blogs/Resolve-your-Many-to-Manys-for-Accurate-Requirements">www.captechconsulting.com/blogs/Resolve-your-Many-to-Manys-for-Accurate-Requirements</a></li> <li>• <b>Small-group activity:</b> Learners investigate small scenarios and define two entities, the relationship between them and resolving relationships as required.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>		<p>Revision workbook</p> <p>Revision Guide page 50, 51 and 53</p>	<p>Lit</p> <p>Social</p> <p>So8 C3 Sp2 Sp5</p>

28/9/20	<b>A1 Relational database management systems</b> Database relations.		<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, discuss database relations and data models. What are they, why are they important?</li> <li>• <b>Tutor presentation:</b> Database relations, generic and semantic data models.</li> <li>• <b>Small-group activity:</b> Learners investigate a variety of scenarios (doctor's surgery, library, students/courses, etc) and apply different data models to them and identify entities.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>		Revision workbook  Revision Guide pages 50 and 51	Lit  Social  So8 C3 Sp2 Sp5
5/10/2020	<b>A1 Relational database management systems</b> Relational algebra	<b>What is relational algebra?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, discussion on extracting data, with some real life examples.   <b>Tutor presentation:</b> Relational algebra, including join and select, union, intersect and notation symbols. See link on relational algebra in the following link <a href="http://db.grussell.org.uk/section010.html">http://db.grussell.org.uk/section010.html</a></li> <li>• <b>Small-group activity:</b> Use examples of simple data sets and identify results of union, join, select and intersect options and discuss results.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>		Revision workbook  Revision Guide page 54	Lit  Social  So8 C3 Sp2 Sp5

12/10/2020	<p><b>A2 Manipulating data structures and data in relational databases</b></p> <p>Updating, inserting, deletion retrieval of data for queries, reports.</p>	<p><b>What actions can SQL perform?</b></p>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, discussion on the requirements in terms of data manipulation.</li> <li>• <b>Tutor-led practical demonstration:</b> Manipulation of data and structures and use of SQL to define, modify and remove data and structures. See link on SQL syntax in the following link <a href="http://www.tutorialspoint.com/sql/sql-syntax.htm">www.tutorialspoint.com/sql/sql-syntax.htm</a></li> <li>• <b>Individual practical activity:</b> Learners review a database schema and perform several actions using SQL to define, modify and remove data and structures.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>		<p>Revision workbook</p> <p>Revision Guide Page 55, 57 and 64</p>	<p>Lit</p> <p>Social</p> <p>So8 C3 Sp2 Sp5</p>
19/10/2020	<p><b>A2 Manipulating data structures and data in relational databases</b></p> <p>Administration of users.</p> <p>Security, integrity, recovery.</p>	<p><b>What Security is needed?</b></p>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, discussion on why security is important.</li> <li>• <b>Tutor-led practical demonstration:</b> User administration techniques and how to apply security settings. See link: Introducing Database Security for Application Developers in the following links:</li> <li>• Link for demo: <a href="https://docs.oracle.com/cd/B12037_01/network.101/b10773/apdvntro.htm">https://docs.oracle.com/cd/B12037_01/network.101/b10773/apdvntro.htm</a></li> <li>• <b>Small-group activity:</b> Learners review a scenario and define a policy for administration, security, integrity and recovery.</li> </ul>		<p>Revision workbook</p>	<p>Lit</p> <p>Social</p> <p>So8 C3 Sp2 Sp5</p>

			<ul style="list-style-type: none"> <li>• <b>Individual practical exercise:</b> Learners apply security, user admin and integrity/recovery procedures following a simple scenario. See video link: Database Administration and Security: Definition and purpose in the following link</li> <li>• Link for exercise: <a href="http://study.com/academy/lesson/database-administration-and-security-definition-and-purpose.html">http://study.com/academy/lesson/database-administration-and-security-definition-and-purpose.html</a></li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>			
2/11/2020	<b>A3 Normalisation</b> Stages of normalisation.	<b>What is normalisation ?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, discussion different way of representing data and their issues.</li> <li>• <b>Tutor presentation:</b> Introduction to normalisation, stages of normalisation. See video links on Database Normalisation in the following links</li> <li>• Links for presentation: Database Normalisation <a href="http://www.youtube.com/watch?v=70nyAehrrSY">www.youtube.com/watch?v=70nyAehrrSY</a> <a href="http://www.youtube.com/watch?v=zc7ucOoj0pg">www.youtube.com/watch?v=zc7ucOoj0pg</a> <a href="http://www.youtube.com/watch?v=JLwcWQA7mP8">www.youtube.com/watch?v=JLwcWQA7mP8</a></li> <li>• <b>Small-group activity:</b> Learners attempt normalisation of data using a simple scenario.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson</li> </ul>		Revision workbook  Revision Guide page 55 and 56	Lit  Social  So8 C3 Sp2 Sp5

			and use Q&A to establish learners' understanding.			
9/11/2020	<b>A3 Normalisation</b> Anomalies – update, insertion, deletion.	<b>What is normalisation ?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson, normalisation quiz.</li> <li>• <b>Tutor presentation:</b> Data structure anomalies, update, insert and delete, and their relationship to normalisation.</li> <li>• <b>Individual practical exercise:</b> Learners attempt a normalisation of data using a more complex scenario. See link to normalisation practice (exercises with answers) in the following link  <a href="https://cs.senecac.on.ca/~dbs201/pages/Normalization_Practice.htm">https://cs.senecac.on.ca/~dbs201/pages/Normalization_Practice.htm</a></li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>	Planned Assessment for Learning Aim A – <i>in class assessment</i>	Revision workbook  Revision Guide 55 and 56	Lit  Social  So8 C3 Sp2 Sp5
16/11/2020	<b>B1 Relational database design</b> Conceptual, logical and physical modelling and entity relationship modelling.	<b>What is the importance of design?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Introduction to the topic. Discussion on the importance of design and its relationship with software design.</li> <li>• <b>Tutor presentation:</b> Conceptual, logical and physical modelling of database design, defining mathematical relations and entity relationship modelling. See link: Data Modelling - Conceptual, Logical and Physical Data Models in the following links Link for presentation:  <a href="http://www.1keydata.com/datawarehousing/data-modeling-levels.html">www.1keydata.com/datawarehousing/data-modeling-levels.html</a></li> <li>• Link for activity:  <a href="http://www.youtube.com/watch?v=QRMURESENjU">www.youtube.com/watch?v=QRMURESENjU</a></li> </ul>		Revision workbook  Revision Guide page 62, 63, 64 and 65	Lit  Social  So8 C3 Sp2 Sp5

			<ul style="list-style-type: none"> <li>• <b>Small-group activity:</b> Learners review a scenario and identify entities and draft an entity relationship diagram. See video link: Entity Relationship Diagram (ERD) Training Video in the following link</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>			
23/11/2020	<b>B1 Relational database design</b> Relational algebra	<b>What is relational algebra and how is used?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Revision of relational algebra covered in topic A.</li> <li>• <b>Tutor presentation:</b> One-to-many, one-to-one, many-to-many, AND, OR, NOT, &gt;, &lt;, ≥, ≤</li> <li>• <b>Small-group activity:</b> Learners investigate use of relational algebra following series of scenarios. See link: SQL Exercises, Practice, Solution - Using Boolean and Relational Operators in following link <a href="http://www.w3resource.com/sql-exercises/sql-boolean-operators.php">www.w3resource.com/sql-exercises/sql-boolean-operators.php</a></li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>		Revision workbook  Revision Guide page 54	Lit  Social  So8 C3 Sp2 Sp5
30/11/2020	<b>B1 Relational database design</b> RDMS and SQL software selection	<b>What software is available and what are the features?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> How do you choose the right software for an application?</li> <li>• <b>Tutor presentation:</b> Types of database software and their features.</li> <li>• <b>Small-group activity:</b> Learners research suitable software for a variety of different applications.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>		Revision workbook  Revision Guide page 58 and 59	Lit  Social  So8 C3 Sp2 Sp5



7/12/2020	<b>B1 Relational database design</b> Application design	<b>What is good design?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson. Interface design – how to make an interface intuitive.</li> <li>• <b>Tutor presentation:</b> Interface and application design, concepts and methods. See PDF link: Databases: Creating a user interface using Access in the following link <a href="https://weblearn.ox.ac.uk/access/content/group/e05e05d2-f4ce-4a24-a008-031832bd1509/LearningRes_Open/Course_Book_Databases_TDAG_CreateUserInterface10.pdf">https://weblearn.ox.ac.uk/access/content/group/e05e05d2-f4ce-4a24-a008-031832bd1509/LearningRes_Open/Course_Book_Databases_TDAG_CreateUserInterface10.pdf</a></li> <li>• <b>Small-group activity:</b> Learners develop an interface design following a given scenario.</li> <li>• <b>Individual practical exercise:</b> Learners attempt to implement parts of the user interface and work in pairs to review their efforts.</li> <li>• <b>Plenary:</b> Share feedback on the practical activity. Summarise lesson and use Q&amp;A to establish learners' understanding.</li> </ul>		Revision workbook  Revision Guide page 62, 63, 64 and 65	Lit  Social  So8 C3 Sp2 Sp5
14/12/2020	<b>B1 Relational database design</b> Implementation and quality.	<b>What makes a system effective?</b>	<ul style="list-style-type: none"> <li>• <b>Lead-in:</b> Recap on previous lesson. Discussion – ways to implement a database system.</li> <li>• <b>Tutor-led discussion:</b> Methods of assessing the quality, effectiveness and appropriateness of a solution.</li> <li>• <b>Small-group activity:</b> Learners investigate some online databases (e.g. e-commerce site product search systems) to consider their quality and effectiveness and report back to the class. See links: Choosing the right database management system, Top Database Management Software</li> </ul>		Revision workbook  Revision Guide page 62, 63, 64 and 65	Lit  Social  So8 C3 Sp2 Sp5

			<p>products and Comparison of relational database management systems in the following links</p> <ul style="list-style-type: none"><li>• Links for activity: Choosing the right database management system <a href="http://www.computerweekly.com/feature/Choosing-the-right-database-management-system">www.computerweekly.com/feature/Choosing-the-right-database-management-system</a> Top Database Management Software products <a href="http://www.capterra.com/database-management-software/">www.capterra.com/database-management-software/</a> Comparison of relational database management systems <a href="https://en.wikipedia.org/wiki/Comparison_of_relational_database_management_systems">https://en.wikipedia.org/wiki/Comparison_of_relational_database_management_systems</a></li><li>• <b>Tutor-led discussion:</b> Implementation techniques, benefits of different methods.</li><li>• <b>Plenary:</b> Share feedback on the activity. Discuss the link between design and quality of the outcome. Summarise lesson and use Q&amp;A to establish learners' understanding.</li></ul>			
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