MODULE-LEVEL TEMPLATE

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| **Details of the institution that has developed the module** |
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| **Details of the authors of/contributors to the course and their role** *(You can delete any sections that do not apply.)* |
| Original author (if applicable) | N/A |
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| *Responsible for:* | Subject Matter Expert. In charge of content development. |
| Co-author/co-contributor | Dr Victoria Mukami |
| *Responsible for:* | Unit Coordinator. In charge of designing and setting up the unit on Moodle. |

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| **Information regarding the format of material to upload onto the OER Africa repository** |
| Primary resource (Not PDF) | MS-Word |
| Will a Moodle common cartridge be uploaded as well? | Yes |

*(A Moodle common cartridge is a .ZIP file of your module – if it is created in Moodle – that can be imported into another university’s Moodle platform.)*

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| **Course details** |
| Module title: | Introduction to Databases |
| Under- or Post-graduate? | Undergraduate | Year of study: | 1st Year 2nd Term  |
| Class contact time (hours): | 21hrs | Number of credits: | 3 |
| Private/online study hours: | 83 hrs 30 min | Number of weeks of study: | 15 |
| Total student learning hours: | 104 hrs 30 min | Number of units of study: | 14 |

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| Programme(s) which might include this Module: | Bachelor of Science in Computer Science, Bachelor of Business and Information Technology, Bachelor of Science in Information Technology, Bachelor of Science in Computer Technology, Bachelor of Science in Computer Engineering, Bachelor of Science in Software Engineering, Bachelor of Arts in Education (Major in Computer Studies) and other Higher Education Computer and Information Technology related programmes (majors and minors) |
| Pre-requisite student abilities and knowledge: | Undergraduate degree students should have successfully completed a course on fundamental concepts of computers. |
| Pre-requisite modules: | * Concepts of Computer Applications
* Fundamentals of Computer Systems
* Digital Literacy
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| Aim of the module: | The module aims to introduce students to theoretical and practical concepts of database design, implementation, and management. |
| Brief description of the module: | The module is designed to create opportunities for you to develop your skills in database design, creation, and querying. Also, you will be introduced to foundational skills in database security and administration. |

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| Intended learning outcomes: | *At the end of this* ***module****, you will be able to:*1. Design relational database systems that are relevant to the needs of a specific organisation /company.
2. Create databases and their objects using a contemporary database management system.
3. Demonstrate the use of data manipulation language to insert, update, query, and delete data in database tables.
4. Describe the basic database administration and database security management concepts.
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| Indicative content: | Week 1: Introduction to DatabasesWeek 2: The Database EnvironmentWeek 3: Database Analysis and DesignWeek 4: Entity-Relational ModellingWeek 5: The Relational ModelWeek 6: NormalisationWeek 7: Introduction to SQLWeek 8: DDL (Syntax and Creation of Database Objects)Week 9: DDL (Adding fields & Constraints and Deletion of Objects)Week 10: DML (Introduction)Week 11: DML (WHERE clause, Sorting, Grouping & Functions)Week 12: DML (Subqueries, JOINs & Advanced Topics)Week 13: Database AdministrationWeek 14: Database Security |
| Form of final/summative assessment: | End of Semester Exam |

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| **Assessment of module-level learning outcomes** |
| Module-level learning outcome | Module assessment task |
| 1. Design relational database systems that are relevant to the needs of a specific organisation /company.
 | The student will be assessed through weekly assignments, quizzes, and mini cases for the practical sections of the module. The main case study (running case) will also be used to assess the practical aspects of the module.The final exam will cut across the four module-level learning outcomes. |
| 1. Create databases and their objects using a contemporary database management system.
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| 1. Demonstrate the use of data manipulation language to insert, update, query and delete data in database tables.
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| 1. Describe basic database administration and database security management.
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| **Significant features or elements of the module** |
| * The group mini case is conducted during the face-to-face session and uses one case that has exclusively different activities that build up during each week.
* Practical oriented individual weekly e-tivities will be based on a running case. Such activities will build off the lessons of the mini case.
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| **Student profile in the context of this module:** |
| What is the target group of students who would do this module? | The module is designed for students in undergraduate computing and/or information technology-related courses. This is a level 1 term 2 course. |
| What **skills** should a *student* have **already** mastered before starting this Module? | Being able to navigate the LMS, self-study skills, research online and computing skills. |
| What **prior knowledge** of the subject matter should a *student* have? | Basic formal computing knowledge. |

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| **Non-expert support:** |
| What **skills** and **prior knowledge** of the subject mattershould *facilitators* have **already** mastered before starting to deliver this Module? | The minimum qualification to use this module as a facilitator one must have a Doctorate degree in an IT related field. |
| What **skills** do *support staff* need to support the delivery of this module? | The minimum qualification to support the delivery of the module, one must have a Masters degree in an IT related degree. |

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| **Quality assurance matters** |
| How will feedback on the module be obtained from students? | A combination of online surveys and discussion forums on the LMS. A combination of both formative and summative feedback will be collected. |
| How will student feedback be used to improve the module? | Student feedback will be used to address challenges that may have occurred and will ultimately be used to design and improve lessons, determine the suitability of resources, inform future design, and development. |
| A certificate, signed by the university’s Head of Quality Assurance, confirming that the module meets the requirements of the PEBL QA rubric is attached. |  Yes 🗹 No ☐ |

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| **Unit-level overview** | **Week** | 1.
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| Topic name: | Module Prelude |
| Aim of the topic: | The week aims to introduce you to the database module, give room for self-introduction, and lay the ground for the next 14 weeks of the module. |
| This topic covers: | * Introduction to the module course plan and resources
* Module facilitator’s contacts
* Peer review and discussion forum rules
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Understood what is offered in the module.
2. Introduce yourself in the ‘tearoom’ discussion forum.
3. Review your peers’ work professionally and courteously.
4. Create an e-portfolio folder.
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| Overview of student activity: | 1. Review the Course plan.
2. Create a personal biography.
3. Review the YouTube video on how to use Moodle.
4. Complete the tasks outlined in e-tivities 0.1 and 0.2 based on reflections from the readings.
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| **Constructive alignment of unit-level outcomes with module-level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Describe what is offered in the module
 | 1 | E-tivity 0.2 | On the LMS, based on marking and grading of the work plan quiz. |
| 1. Introduce yourself in the ‘Tearoom’ discussion forum
 | 1 | E-tivity 0.1 | Discussion forum on the LMS. |
| 1. Review peers’ work professionally and courteously
 | 1 | E-tivity 0.1E-tivity 0.2 | On the LMS, based on marking and grading of the work plan quiz. |
| 1. Create an e-portfolio folder
 | 1 | E-tivity 0.3 | On Google Drive with the folder shared with the instructor |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| None - Preparatory week |
| Purpose of the week: |
| The week acts as a precursor to the module. Its aim is to engage students by giving them room to introduce each other, engage each other in their expectations of the course while getting an overview of the course. |
| Over to you: *(a description of the process of the section)* |
| This section involves you (the learner) looking through the learning resources provided and thereafter, working on the e-tivities to demonstrate whether you understood and internalized the content in the reading materials and video. |
| Pre-topic Activity |  Number of hours | N/A |
| N/A |
| Face to Face Activity | Number of hours | N/A |
| N/A |
| Online activity: | Number of hours | 2 |
| What should students do? | **E-tivity 0.1**This is the very first e-tivity you will work on. The aim of this e-tivity is to introduce yourself to your instructor and fellow students. You will have lots of group activities within the course and this is the very start as it will be the basis of forming relationships now and throughout the course.**Task 1**The first task is to write a brief biography (bio) that will introduce you to the other students. It will also be a way for you to express how you anticipate the unit “Introduction to Databases” to benefit you once you are done with the class. Finally ensure to list some of your strengths**Task 2**Once you finish writing, you will post your bio within the forum. You will read what the other students have posted, and comment on their bios, suggesting how you might work together to exploit your strengths for each other’s benefit.  **E-tivity 0.2**The purpose of this e-tivity is to assess the understanding of the unit overview regarding your aspirations and goals. **Tasks**First watch the [video](https://youtu.be/o3feQyMckUg) that directs you on how to use the LMS (eNaz). Next read the Course Plan provided within the LMS. Once you complete, attempt the quiz found in week 0 aimed at checking your understanding of the course plan.**E-tivity 0.3**The purpose of this e-tivity is to help you prepare an e-portfolio folder. An e-portfolio folder is a location within your computer or on the cloud where you will be storing all your course materials and resources such as assignments, notes, feedback etc. You are required to share the folder with the course instructor to allow him/her to monitor progress and give feedback where applicable.**Tasks**Watch the [video](https://youtu.be/EbVnObwFJic) on how to create and share a Google drive folder. After which create a folder named “Databases e-portfolio - your student id” e.g., “Databases e-portfolio – sid001005”. Share the folder with your instructor using the email address provided in the Course Plan. Set the instructor as a viewer for the folder. |
| Where do they do it? | **E-tivity 0.1**1. Individually, introduce yourself in the discussion forum.
2. Reply to your colleagues’ responses in the discussion forum.

**E-tivity 0.2**Attempt the course plan quiz.**E-tivity 0.3**Create your e-portfolio and share with the instructor as a viewer. |
| By when should they do it? | **E-tivity 0.1*** Introductions should be submitted by Friday 23:59
* Responses should be submitted by Sunday 23:59

**E-tivity 0.2*** The quiz should be complete by Sunday 23:59

**E-tivity 0.3*** The activity should be complete by Sunday 23:59
 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The quiz will be used to assess the student’s understanding of what is required in the course. |
| How does this section link to other sections of the module? |
| The next e-tivity in week 1 will start the module and will factor the responses made in e-tivity 0.2. |

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| Total number of hours | 2 |

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| Which learning resources/ references will scaffold the students’ learning? | *Course Plan provided within the LMS.**Watch the videos on Introduction to Moodle (eNaz) and how to create and share Google drive folders:* * [*https://youtu.be/o3feQyMckUg*](https://youtu.be/o3feQyMckUg)
* [*https://youtu.be/EbVnObwFJic*](https://youtu.be/EbVnObwFJic)
 |
| How are students enabled to access the resources? | *Students enrolling into the LMS to get access to the learning resources* |
| Where in this unit are students expected to work collaboratively? | *E-tivities 0.1 and 0.2 – through the reflections post and the peer review* |
| How has an inclusive approach been incorporated in this unit? | *Group work activities during the self-introduction and response.* |
| How will feedback on unit be obtained from students? | *For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey.*  |
| How will student feedback be used to improve unit? | *The feedback will be used to improve on the next topics and for future unit offering.* |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | *Formative feedback will be provided at least one week after submission of the assignments.* |

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| **Unit-level overview** | **Week** |  |
| Topic name: | Introduction to Databases |
| Aim of the topic: | The topic introduces the course by establishing a foundation for database systems from traditional file-based approaches.  |
| This topic covers: | * Basic Concepts and their definitions
* The file-based approach and its shortcomings
* The database approach with pros and cons
* The evolution of database systems to the DBMS
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Describe the evolution of database systems.
2. Differentiate between traditional file-oriented systems and database systems.
3. Describe a DBMS and components of its environment.
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| Overview of student activity: | 1. Read chapter 1 to 3 (Database Design).
2. Read chapter 1 to 3 (Relational Database Concepts).
3. Review the YouTube video on an introduction to databases.
4. Summarize and reflect on the readings from a) and b).
5. Complete the tasks outlined in E-tivities 1.1 and 1.2 based on reflections from the readings.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Describe the evolution of database systems
 | 1 | E-tivity 1.1 | On the LMS, based on marking and grading of the puzzle quiz. |
| 1. Differentiate between traditional file-oriented systems and database systems
 | 1 | E-tivity 1.1 | On the LMS, based on marking and grading of the puzzle quiz. |
| 1. Describe a DBMS and components of its environment
 | 1 | E-tivity 1.1 | On the LMS, based on marking and grading of the puzzle quiz. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Design relational database systems that are relevant to needs of a specific organisation /company. |
| Purpose of the week: |
| The week introduces the course by establishing a foundation for database systems from traditional file-based approaches. This topic covers the basic concepts and definitions, the file-based approach and its shortcomings, the database approach with its pros and cons. It also introduces the DBMS and the evolution of database systems. |
| Over to you: *(a description of the process of the section)* |
| This section requires you to look through the learning resources as you summarise the chapters provided. Thereafter, you will work on the e-tivities to demonstrate whether you understood and internalized the content. |
| Pre-topic Activity |  Number of hours | 1 |
| Watch the [video](https://youtu.be/wR0jg0eQsZA) on an introduction to databases provided in the learning resources. Capture important notes and reflect on the concepts introduced from the video |
| Face to Face Activity | Number of hours | 1.5 |
| * Think, pair, share on the concepts covered in the pre-topic activity.
 |
| Online activity: Online activity: | Number of hours | 6.5 |
| What should students do? | **E-tivity 1.1 (Mandatory)**The purpose of this e-tivity is to introduce you to the basic concepts of databases. This includes a definition of basic terminology.**Tasks 1*** Read chapter 1 to 3 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook on Before the Advent of Database Systems, Fundamental Concepts and Characteristics and Benefits of a Database, respectively. Also read chapter 1 and 3 of the [Relational Database Concepts](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook covering Some Initial Concepts and File-based Systems. As you go through the materials, capture important points in any format of your choice. The aim is not to replicate the notes but to point out unique points of interest.
* The following points should guide you in ensuring that you do not miss out on critical aspects of the topic:
	+ Are you able to identify the challenges and drawbacks experienced during the file-based system?
	+ Are you able to highlight the benefits of database approach?
	+ Are you able to note and understand the main differences between the file-oriented and the database system?
	+ Based on the components of the DBMS environment, are you able to look at an organization using databases and identify the various components?

**Task 2*** Based on what you have read in the previous task, fill in the missing gaps in the puzzle to gauge on your knowledge gained and understanding on the topic.

**E-tivity 1.2 (Optional)**The purpose of this e-tivity is to dig deeper in introductory database concepts. While this activity is optional, it will prepare you as a student toward the formative assessment (quiz) offered later in the course. **Tasks**Identify and discuss a real-world application of database systems that you may have encountered. If possible, keep it as local as possible based on your country. Individually, research and review real world applications of databases. The guidelines herein will aid in identifying appropriate resources:* You may opt to use the Google search engine to search, as you pay attention to the website’s credibility.
* Look up videos on YouTube or any other site that have got high ratings.
* Filter for OER or Creative Commons resources on YouTube.
* As you look up different tutorials, be sure to keenly analyse the website author, date of publication as well as their reputation (if possible).
* Access published research papers via scholar.google.com or research gate. Ensure that the resources are indexed with ISBN or DOI numbers.

Post your work on the LMS where any of your colleagues and the instructor will react, give feedback, and further explain examples presented.Keep a copy of your work in your e-portfolio folder for future review. This will be helpful as you revise for your final examinations and for the instructor to monitor your participation and/or progress when necessary. |
| Where do they do it? | **E-tivity 1.1** The e-tivity will be done from the LMS.**E-tivity 1.2**Research and post your work in the LMS for your colleagues and the instructor to look at. |
| By when should they do it? | **E-tivity 1.1**Puzzle quiz to be completed by Friday 23:59**E-tivity 1.2*** Research and posting online should be completed by Sunday 23:59
* Any highlights will be provided during week 2 face to face session.
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| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed based on formative assessment. Upon successful completion of the puzzle quiz, you will be able to proceed to the next sections. |
| How does this section link to other sections of the module? |
| The next e-tivity in week 2 will build on the summary made in e-tivity 1.1 by exploring knowledge on real life applications of database systems. |

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| Total number of hours | 9 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 1 to 3 covering *Before the Advent of Database Systems, Fundamental Concepts and Characteristics and Benefits of a Database, respectively*. Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 1 and 3 covering *Some Initial Concepts and File-based Systems*. Watch the Introduction to Databases Video: <https://youtu.be/wR0jg0eQsZA>  |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | During the face-to-face group work session. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (think, pair, and share) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | The Database Environment |
| Aim of the topic: | The topic brings to light the database system environment.  |
| This topic covers: | * The Layered database system architecture
* The language of databases
* Data models and conceptual modelling
* DBMS components and functions
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Describe the layered database system architecture.
2. List and describe database languages and data models.
3. Describe the various components and functions of a DBMS.
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| Overview of student activity: | 1. Read chapter 4 to 6 (Database Design).
2. Read chapter 4 (Relational Database Concepts)
3. Review the YouTube video on an introduction to DBMS.
4. Summarize and reflect on the readings from a) and b).
5. Complete the tasks outlined in E-tivity 2.1 based on reflections from the readings.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Describe the layered database system architecture
 | 1 | E-tivity 2.1 | On the LMS, based on marking and grading of the progression quiz. |
| 1. List and describe database languages and data models
 | 1 | E-tivity 2.1 | On the LMS, based on marking and grading of the progression quiz. |
| 1. Describe the various components and functions of a DBMS
 | 1 | E-tivity 2.1 | On the LMS, based on marking and grading of the progression quiz. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Design relational database systems that are relevant to needs of a specific organisation /company |
| Purpose of the unit/week/section: |
| The week brings to light the database system environment. You will be introduced to the layered database system architecture, the language of databases, data models and conceptual modelling. The topic will further explore DBMS components and function. |
| Over to you: *(a description of the process of the section)* |
| This week we continue to build the knowledge we acquired during the first week. We will again review the week's notes and then work toward summarizing the notes and thereafter work on the discussion forum together with your colleagues. |
| Pre-topic activity: |  Number of hours | 1 |
| A review of an introduction to databases is to be conducted. Based on the readings from Database Design, attempt the three exercises after chapter 1, 2 and 3. The review will be done during the face-to-face activity. |
| Face to face time: *(if applicable)* | Number of hours | 1.5 |
| * Review of the pre-topic activity.
* Highlights of the presentations from e-tivity 1.2 (if any).
* Question and Answer session based on the weeks’ notes.
* Think, pair, share on the weeks’ concepts.
 |
| Online activity: | Number of hours | 4 |
| What should students do? | **E-tivity 2.1**The purpose of this e-tivity is to help you to understand the database system architecture, data models and conceptual modelling. **Task 1*** You are required to read chapter 4 to 6 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook on Types of Data Models, Data Modelling and Classification of Database Management Systems, respectively. Additionally, read chapter 4 of the [Relational Database Concepts](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook covering the ANSI/SPARC 3 Schema Architecture. You may also want to spare some time to watch the brief [video](https://youtu.be/lDpB9zF8LBw) in introduction to DBMS, all of which are provided in the learning resources.

Be sure to notate the following aspects as you read through the resources:* + Characteristics of the layered database system architecture
	+ Key aspects of database languages and data models
	+ Functions and components of a DBMS

Note that, for ease of notation, you may want to print the reading section then use a highlighter to notate the above stated key aspects.**Task 2*** Based on the reading and annotation you made in the previous task, you are required to attempt the progression quiz to gauge your understanding of the topic. You will only be allowed to proceed to the next section upon successful completion of the quiz.

Keep a copy of your work in your e-portfolio folder |
| Where do they do it? | **E-tivity 2.1:**Progression quiz to be done from the LMS. |
| By when should they do it? | **E-tivity 2.1**Progression quiz to be complete by Friday 23:59. |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed based on formative assessment. Upon successful completion of the quiz, you will be able to proceed to the next sections. |
| How does this section link to other sections of the module? |
| The concepts of the Database Environment covered this week will be positioned in the Database Analysis and Design cycle that will be covered next week. |

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| Total number of hours | 6.5 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 4 to 6 covering *Types of Data Models, Data Modelling and Classification of Database Management Systems*.Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 4 on the *ANSI/SPARC 3 Schema Architecture*. Watch the introduction to DBMS video: <https://youtu.be/lDpB9zF8LBw>  |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | During the face-to-face group work session. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (think, pair, and share) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | Database Analysis and Design |
| Aim of the topic: | The topic aims at exploring the system development process with respect to database design. The various phases of the database system development life cycle with the activities undertaken per phase will be covered. The topic also aims at showing the relationship between the database system development cycle and the traditional System Development Life Cycle (SDLC). |
| This topic covers: | * Database development life cycle.
* Roles in the database environment
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Describe the activities that occur per phase of the database system development lifecycle.
2. Relate the database system development life cycle to the normal system development life cycle.
3. Describe the roles in the database environment.
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| Overview of student activity: | 1. Read chapter 13 and 14 (Database Design).
2. Read chapter 10 (Relational Database Concepts).
3. Review the YouTube video on Database Analysis and Design.
4. Summarize and reflect on the readings from a) and b).
5. Complete the tasks outlined in E-tivity 3.1 and 3.2 based on reflections from the readings.
6. Complete the face-to-face group mini case.
7. Complete E-tivity 3.3 which builds from the face-to-face mini case.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Describe the activities that occur per phase of the database system development lifecycle
 | 1 | E-tivity 3.1E-tivity 3.3 | On the LMS, based on marking and grading of mind maps and assignment. |
| 1. Relate the database system development life cycle to the normal system development life cycle
 | 1 | Face-to-face group mini caseE-tivity 3.1E-tivity 3.3 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of mind maps and assignment. |
| 1. Describe the roles in the database environment
 | 1 | Face-to-face group mini caseE-tivity 3.3 | Complete the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Design relational database systems that are relevant to needs of a specific organisation /company |
| Purpose of the unit/week/section: |
| The week explores the system development process with respect to database design. You will be introduced to the database development life cycle. In addition, you will also cover the various roles in the database environment. |
| Over to you: *(a description of the process of the section)* |
| Week three is a build-up of what you learnt during the first two weeks. During this week you will interact with your first mini case. This week also introduces you to the course running case. You will work collaboratively during the face-to-face session and individually during the assignment. |
| Pre-topic activity: |  Number of hours | 1 |
| Review the different database roles by watching the [video](https://youtu.be/uTD2b8vk5yM) on database roles and capture new concepts. Based on the various database roles, we will use the information to reflect during the face-to-face session. |
| Face to face time: *(if applicable)* | Number of hours | 1.5 |
| * Review the pre-topic activity.
* Highlight specific concepts drawn from the weeks’ notes.
* Group discussion on a mini case study in line with the Database Analysis and Design.

***Mini case study:*** *Think of a bookshop that sells books, stationery and gift items to various individuals, businesses, and corporations. The bookshop has five employees: 2 tellers, 1 sales representative, 1 manager and 1 social media marketer. The bookshop has been running on a manual system, where inventory management, transaction processing and ordering is all done manually. Records are stored in large physical books that are updated daily and reports tallied at the end of each week with a final report tallied at the end of the month. The bookshop owners have realized the need for an automated system to handle the tasks above.****Task:*** *Based on the case, identify the life cycle that would be deemed necessary for the development of the database. Further, identify the various roles that would be required for the development and administration of the database.* |
| Online activity: | Number of hours | 6.5 |
| What should students do? | **E-tivity 3.1 (Mandatory)**The purpose of this e-tivity is to explore the process of Database Analysis and Design.**Tasks**Chapters 13 and 14 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook explores the process of database development and identifies database users. As you read these chapters, create a mind map that identifies the phases in the traditional System Development Life Cycle (SDLC) and how they articulate with the process of Database System Development. In addition, watch the [video](https://www.youtube.com/watch?v=z8Twuhj4B9A) on the Database Development Lifecycle and update your mind map with any concepts picked. You should also identify (and show on the mind map) how the requirements of database users are accommodated in the process.**Task 2:**Using the mind map that you created in Task 1 as a background, read chapter 10 of the [Relational Database Concepts](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook and, using a different colour pen, notate the mind map with any additional aspects of database development that you discover.**Task 3:**The notated mind map is the basis for this task. With a third colour pen in hand, conduct an internet search and update the document with any further information that you discover about the systems development life cycle. (Make sure that you note the sources of this new information on the mind map).Take a photograph of the latest version of the mind map and post it in the discussion forum. **Task 4:**You will be allocated to a group of 5 students. Each of you will review the mind maps posted by the other 4 students focussing on the following criteria:1. Are there any phases of the traditional SDLC that are not reflected on the mind map and, if so, which ones?
2. How has your fellow student created bridges between the phases of the lifecycle and the process of Database Analysis and Design?

**E-tivity 3.2 (Optional)**The purpose of this e-tivity is to dig deeper in Database Analysis and Design. After identifying the phases of the database analysis and design life cycle in e-tivity 3.1, let us try to focus on the data conversion and loading phase. Using an example, discuss what this phase entails. The guidelines herein will aid in identifying appropriate resources:* You may opt to use the Google search engine to search, as you pay attention to the website’s credibility.
* Look up videos on YouTube or any other site that have got high ratings.
* Filter for OER or Creative Commons resources on YouTube.
* As you look up different tutorials, be sure to keenly analyse the website author, date of publication as well as their reputation (if possible).
* Access published research papers via scholar.google.com or research gate. Ensure that the resources are indexed with ISBN or DOI numbers.

Post your work on the LMS where any of your colleagues and the instructor will react, give feedback, and further explain examples presented.**E-tivity 3.3: (Mandatory)**The purpose of this e-tivity is to apply the database system development life cycle on a running case. For this e-tivity, you will be required to analyse the running case while subjecting it to the database system development life cycle.Based on the background of the running case, it would be ideal for tender stores to get a database designed and developed. The database would be a central repository with the aim of ensuring consistent, non-redundant data across all departments within the wholesaler. **Tasks*** Identify the various steps that would be deemed necessary during the database development lifecycles.
* Using appropriate examples distinguish each phase you identified and why it would be used in the part of the wholesaler.
* With the database development life cycle in mind, identify the various roles that may be needed by the wholesaler to manage and maintain the database.

You will as an individual, research and submit your work for evaluation as an assignment.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 3.1** 1. Individually, post your mind map in the discussion forum.
2. Post the reviews or reactions to your colleagues’ mind map in the discussion forum.

**E-tivity 3.2:** Research and post your work in the LMS for your colleagues and the instructor to look at.**E-tivity 3.3:** Individually, submit the work as an assignment through the LMS. |
| By when should they do it? | **E-tivity 3.1**1. Summaries and Reflections should be submitted by Friday 23:59
2. Peer Reviews should be submitted by Sunday 23:59

**E-tivity 3.2:** Research and posting online should be completed by Sunday 23:59**E-tivity 3.3:**Assignment to be submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed based on peer review of mind maps and the assignment. The instructor will randomly review the peer review discussion and presentations and provide highlights during the face-to-face session. The assignment is graded based on a rubric setup by the instructor.  |
| How does this section link to other sections of the module? |
| The next e-tivity will build on the concepts learnt from this e-tivity by expounding on one of the phases of the database analysis and design life cycle. |

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| Total number of hours | 9 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 13 to 14 covering *Database Development Process and Database Users*. Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 10 on *Database Development*.Watch the following YouTube videos on Database Development Life Cycle and Roles in the Database Environment: * <https://www.youtube.com/watch?v=z8Twuhj4B9A>
* <https://youtu.be/uTD2b8vk5yM>
 |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face-to-face group Mini CaseE-tivity 3.1 - through the peer review |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (think, pair, and share) during the face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | Entity-Relationship Modelling  |
| Aim of the topic: | The topic will expose you to Entity-Relational Modelling. You will get exposed to the techniques for determining entities, their attributes, and relationships. Afterwards, you will be able to build Entity Relationship Diagrams in real world case scenarios. |
| This topic covers: | * Techniques for determining entities, their attributes and relationship.
* Build an Entity Relationship Diagrams.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Identify entities, their attributes, and relationships from the case study.
2. Build an Entity Relationship Diagram by combining all the entities and the relationships.
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| Overview of student activity: | 1. Read chapter 8 (Database Design).
2. Review the YouTube video on Entity Relationship Diagram.
3. Reflect on the readings and video from a) and b) respectively.
4. Complete the face-to-face group mini case.
5. Complete e-tivity 4.1 which builds from the face-to-face group mini case.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Identify entities, their attributes, and relationships from the case study.
 | 1 | Face to Face Group Mini CaseE-tivity 4.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment.  |
| 1. Build an Entity Relationship Diagram by combining all the entities and the relationships
 | 2 | Face to Face Group Mini CaseE-tivity 4.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Create databases and their objects using a contemporary database management system |
| Purpose of the unit/week/section: |
| During the week, you will be exposed to the process of Entity-Relational Modelling. You will get to understand the techniques for determining entities, their attributes, and relationships. Afterwards, you will be able to build Entity Relationship Diagrams in real world case scenario. |
| Over to you: *(a description of the process of the section)* |
| Week 4 focused on a mini case with a running case being introduced in the previous week. Guess What!! You got it. This week will use the same mini and running case that are already introduced to. We build on the cases to ensure that you understand this week's topic. |
| Pre-topic activity: |  Number of hours | 30 min |
| A review of the database development process was done during the previous week. Based on the readings from week 3, attempt the exercises after chapter 13. The review of the questions will be done during the face-to-face activity. |
| Face to face time: *(if applicable)* | Number of hours | 1.5 |
| * Review of the pre-topic activity.
* A review of the discussion forum posts for e-tivity 3.2 (if any).
* A highlight of new concepts related to Entity-Relationship Modelling will be reviewed.
* Finally, a group discussion on a mini case study with a focus of the Entity-Relationship Modelling will be performed in groups.

***Mini case study****: A well-structured University is made up of Schools, headed by a Dean. Each School has one or more Departments that are headed by a Chairman. Chairs of departments report to the Dean of their School. Each department is composed of one or more programs. As a major requirement by the Commission of University Education, each program must have a program leader who is a subject matter expert. Deans, Chairs, and program leaders are members of faculty with extra responsibility for a specific period. They hence belong to a specific department within a School. Every faculty is identified by his/her PF number, name, gender, and area of speciality while departments and schools have unique names for ease of identification.****Task:*** *Identify the entities, their attributes, and relationships. Further, build an ERD for the case.* |
| Online activity: | Number of hours | 4 |
| What should students do? | **E-tivity 4.1**During this week we have done a review of Entity-Relational Modelling. To further understand the weeks’ topic, we will perform the tasks listed. Ensure to do a review of the tasks from e-tivity 3.3 as it builds up to this week. You will be required to come up with the following:**Tasks*** Read chapter 8 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook covering the entity relationship data model. While reading, capture short notes as you update the concepts you picked from the face-to-face session.
* Also watch the [video](https://www.youtube.com/watch?v=c0_9Y8QAstg) on entity-relationship diagrams and update on the concepts you picked from the previous task.
* After a thorough review of the readings and the video, perform the following tasks:
1. Identify the entities, attributes, and relationships of the database.
2. Draw an entity relationship diagram (ERD) for Tender stores.

You will work individually for this e-tivity and will submit your model for evaluation as an assignment.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 4.1**Individually, submit the work as an assignment through the LMS. |
| By when should they do it? | **E-tivity 4.1**Assignment to be submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed by the formative assessment which is in the form of a face-to-face group mini case activity and the assignment. The assignment is graded through a rubric created by the instructor.  |
| How does this section link to other sections of the module? |
| This section focused solely on entity relationship modelling using both the mini and running case. The next week builds up on the concepts learnt by introducing the relational model. |

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| = Total number of hours | 6 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 8 covering *Entity Relationship Data Model*. Watch a video that introduces the entity relationship model: <https://www.youtube.com/watch?v=c0_9Y8QAstg> **Main Course Case Study (Running Case)****Background**Tender Stores(c) is a wholesale shop located in Ongata Rongai, Kenya. The shop specializes in selling goods at wholesale prices to small scale retailers and individuals. The shop collects various products from different manufacturing plants and stores the products in their warehouse within Rongai town. Each product is identified by a unique product id, name, and cost. The wholesaler also gets deliveries from several manufacturers. The shop currently has one branch with 14 employees distinguished by their employee numbers, names, and roles. The employees include 1 general manager, 3 tellers, 1 cashier, 4 pickers, 1 picker supervisor and 4 drivers. The tellers oversee picking orders from walk-in-customers, those ordering via phone or using email. When an order is picked, the customer then has two options for mode of payment: cash or M-Pesa. The payments are received by the cashiers. The paid invoice is then passed on to the pickers, who then retrieve various items from the warehouse. The items are then verified by the picker supervisor and packaged by the picker. The manager oversees the overall running of the store and ensuring that the stock levels do not go low. The drivers oversee making deliveries to various small-scale retailers and picking various goods from manufacturers. |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to face group mini case. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (group mini case) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | The Relational Model |
| Aim of the topic: | The topic aims to introduce the relational model, an approach for managing data by making use of a structure and language coherent with the first-order predicate logic, such that all data is represented in terms of tuples, grouped into relations or tables. You will also get exposed to integrity rules and constraints as critical aspects in relational models. |
| This topic covers: | * Relational Model concepts
* Integrity Rules
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Discuss the types of integrity constraints.
2. Describe views and their importance in a database environment.
3. Discuss the key characteristics of relational algebra and relational calculus.
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| Overview of student activity: | 1. Review the previous weeks and annotate where necessary.
2. Read chapter 7 to 9 (Database Design) and summarize notes.
3. Read chapter 2 to 5 (Relational Database Concepts) and update summarized notes.
4. Complete the tasks outlined in e-tivity 5.1 by updating annotated document with the new concepts.
5. Complete e-tivity 5.2 which is a formative assessment.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Discuss the types of integrity constraints.
 | 1 | E-tivity 5.2 | On the LMS, based on marking and grading of the quiz. |
| 1. Describe views and their importance in a database environment.
 | 1 | E-tivity 5.2 | On the LMS, based on marking and grading of the quiz. |
| 1. Discuss the key characteristics of relational algebra and relational calculus.
 | 1 | E-tivity 5.2 | On the LMS, based on marking and grading of the quiz. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| 1. Design relational database systems that are relevant to needs of a specific organisation/company.
2. Create databases and their objects using a contemporary database management system.
 |
| Purpose of the unit/week/section: |
| This week explores the relational model as a basis for database systems. It covers concepts behind the relational model, for instance, primary keys and foreign keys. You will also be exposed to fundamental integrity rules. |
| Over to you: *(a description of the process of the section)* |
| This week is a cumulative of what you have learnt from week 1 - 5. The week will focus on only two activities, but you will also need to read through your notes as you will have a quiz that will cover all the topics covered this far. |
| Pre-topic activity: |  Number of hours | 2 |
| A review of the entity relationship model is to be conducted. Based on the readings from week 4, attempt the practical exercises after chapter 8 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook.Please also spere some time to fill in the survey (Critical Incidence) found in Week 5. This will help us to find out how you are doing in the course up to now and ways of improving. The review for both activities will be done during the face-to-face activity. |
| Face to face time: *(if applicable)* | Number of hours | 1.5 |
| * Review of the practical exercises from the pre-topic activity.
* Review of results from the online survey.
* Think, pair, share on the weeks’ concepts.
 |
| Online activity: | Number of hours | 6 |
| What should students do? | **E-tivity 5.1 (Mandatory)**This week is the culmination of the preliminary introduction to databases. The week comprises of a quiz accounting for what has been covered this far. Before attempting the quiz, you are required to perform the following tasks:* First, review the e-tivities from week 1 – 4 together with any summary notes and/or notations that you made. This is aimed at helping you to pick lessons learnt, new concepts and keywords and fill this into the annotated template provided.
* The second task requires you to review chapter 7 – 9 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook and make short summary notes in a format of your own choice.
* The third task is to compare the notes from chapter 2 – 5 of the [Relational Database Systems](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook as you update your summarized notes.
* Based on the readings from this week, pick up the annotated template you filled from task one and update with the week 5 concepts and keywords.

**E-tivity 5.2(Mandatory)**Once you have completed e-tivity 5.1 you are now required to apply the knowledge you have acquired towards undertaking e-tivity 5.2. The e-tivity is a quiz which will be used to gauge knowledge gained up to this far i.e., week 1 – 5 topics on Introduction to databases, the database environment, database analysis and design, entity-relational modelling, and the relational model, respectively. The quiz will be purely multiple choice and will be automatically marked with feedback provided upon submission. You are required to individually attempt the quiz.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 5.1**Review notes and use the annotated template in the LMS to capture keywords and concepts.**E-tivity 5.2**Individually, attempt the Quiz through the LMS. |
| By when should they do it? | **E-tivity 5.1:** Annotations should be completed by Saturday 23:59.**E-tivity 5.2:**Attempt Quiz by Sunday 23:59. |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes for this and the previous weeks are assessed through a quiz, as a formative assessment. |
| How does this section link to other sections of the module? |
| The next e-tivity will build on the concepts learnt from this week’s topic by exploring the process of normalisation. |

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| Total number of hours | 9.5 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 7 and 9 on *The Relational Data Model and Integrity Rules and Constraints*. Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 2 and 5 on Why Relational and The Relational Model.  |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to face session. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (think, pair, and share) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | Normalisation |
| Aim of the topic: | The topic aims at imparting knowledge on normalisation. Normalisation is basically a process for restructuring a database, normally a relational database with the objective of removing redundancy and improving on the integrity of data. The topic will hence explore the process of normalisation, up to the third normal form. |
| This topic covers: | * The rationale for normalisation.
* How to determine functional dependency, partial dependency, and transitive dependencies.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Comprehend the need for normalisation.
2. Describe the different types of dependencies.
3. Normalise a given relation up to at least the third normal form.
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| Overview of student activity: | 1. Watch the videos from the pre-topic activity.
2. Read chapter 10 to 12 (Database Design).
3. Read chapter 13 (Relational Database Concepts).
4. Summarize and reflect on the readings from a), b) and c).
5. Complete the face-to-face group mini case.
6. Complete E-tivity 6.1 which is a formative assessment.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Comprehend the need for normalisation
 | 1 | E-tivity 6.1 | On the LMS, based on marking and grading of the assignment. |
| 1. Describe the different types of dependencies
 | 1 | E-tivity 6.1 | On the LMS, based on marking and grading of the assignment. |
| 1. Normalise a given relation up to at least the third normal form
 | 1 | E-tivity 6.1 | On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Design relational database systems that are relevant to needs of a specific organisation /company |
| Purpose of the unit/week/section: |
| The topic covers concepts behind normalisation for database cleaning. It will explore the rationale for normalisation, how to determine functional dependency, partial dependency, and transitive dependencies. These will be achieved through real case scenarios following through the normalisation process, all the way from first normal form through second to third normal forms. |
| Over to you: *(a description of the process of the section)* |
| This section involves you looking through the learning resources and summarizing the chapters provided. Thereafter, you will work on the e-tivities to demonstrate whether you understood and internalized the content. |
| Pre-topic Activity |  Number of hours | 1 |
| Review the videos provided on Normalization while capturing relevant notes. The videos give an introduction of the term normalization then looks at the process of practically normalizing. The videos are to be reviewed before the face-to-face session to ensure that students understand concepts highlighted. |
| Face to Face Activity | Number of hours | 1.5 |
| * Review week 5 quiz
* Highlight concepts related to normalisation.
* Group discussion on a mini case study in line with Normalisation.

***Mini case study****: A well-structured University is made up of Schools, headed by a Dean. Each School has one or more Departments that are headed by a Chairman. Chairs of departments report to the Dean of their School. Each department is composed of one or more programs. As a major requirement by the Commission of University Education, each program must have a program leader who is a subject matter expert. Deans, Chairs, and program leaders are members of faculty with extra responsibility for a specific period. They hence belong to a specific department within a School. Every faculty is identified by his/her PF number, name, gender, and area of speciality while departments and schools have unique names for ease of identification.****Task:*** *Identify the fields/attributes that could formulate the database. Further, perform normalisation up to 3NF for the case. The resulting 3NF will be used in the face-to-face activity for week 8.* |
| Online activity: | Number of hours | 5 |
| What should students do? | **E-tivity 6.1 (Mandatory)**The purpose of this e-tivity is to explore the process of normalisation. You will be required to perform the tasks listed below based on the running case. At the end of the topic, you will as an individual undertake normalisation up to 3NF. **Task 1**Keeping in mind e-tivities 3.3 and 4.1 from previous weeks and the background of the running case (found in the learning resources - Week 4), you are required to read chapter 10, 11 and 12 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook covering ER Modelling, Functional Dependencies and Normalisation and chapter 13 of the [Relational Database Systems](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook on Normalisation and Why it Matters. Additionally, watch the four videos ([Basic Concepts](https://youtu.be/xoTyrdT9SZI), [1NF](https://youtu.be/mUtAPbb1ECM), [2NF](https://youtu.be/R7UblSu4744), [3NF](https://youtu.be/aAx_JoEDXQA)) on normalization to familiarize yourselves with the process.As you go through the topic’s materials, be sure to capture and make summary notes in any format of your choice. You may also opt to notate key aspects as you read through the materials. I am sure by now you know how to notate!!**Task 2**Upon completion of task 1 and keeping in mind of the running case tasks, attempt the following:1. Identify fields/attributes that will formulate a database for the case.
2. Determine the fields that could be used as unique fields.
3. Undertake the full process of normalisation up to 3NF for Tender stores.

Capture the SQL statements executed plus the screenshots of the outcome in an MS-Word document for submission.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 6.1**Individually, submit the work as an assignment through the LMS |
| By when should they do it? | **E-tivity 6.1**Assignment submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed by the face-to-face group mini case activity and the assignment. The assignment is graded through a rubric created by the instructor.  |
| How does this section link to other sections of the module? |
| The next e-tivity will build on the concepts learnt from this e-tivity by introducing the SQL for actual design of the database. |

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| Total number of hours |  7.5 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 10, 11 and 12 on ER Modelling, Functional Dependencies and Normalisation. Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 13 on Normalisation and Why it Matters. Watch the following videos on Normalization.* Basic concept of normalization - <https://youtu.be/xoTyrdT9SZI>
* First Normal Form - <https://youtu.be/mUtAPbb1ECM>
* Second Normal Form - <https://youtu.be/R7UblSu4744>
* Third Normal Form - <https://youtu.be/aAx_JoEDXQA>
 |
| How are students enabled to access the resources? | Students enrolling on the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to face group mini case. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (group mini case) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | Introduction to Structured Query Language (SQL) |
| Aim of the topic: | The topic aims to introduce you to the Structured Query Language (SQL) as a database language. SQL is one of the most famous languages of the database applicable to relational databases. The topic will expose you on how to write and execute SQL statements, together with the ISO SQL data types. |
| This topic covers: | * Introduction to the language of databases, i.e., SQL.
* Overview of the two broad categories of SQL, namely, Data Definition Language (DDL) and Data Manipulation Language (DML).
* The topic will further outline the rules behind the writing and execution of SQL statements.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Differentiate between data definition language and data manipulation language.
2. Describe rules relating to writing SQL queries.
3. List and discuss the various ISO SQL data types.
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| Overview of student activity: | 1. Read chapter 15 (Database Design) and make short notes.
2. Read chapter 7 and 8 (Relational Database Concepts) and improve the notes.
3. Review the YouTube video on an introduction to SQL.
4. Summarize and reflect on the readings from a) and b).
5. Complete the tasks outlined in e-tivity 7.1 based on reflections from the readings.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Differentiate between data definition language and data manipulation language
 | 1 | E-tivity 7.2 | On the LMS, based on marking and grading of the progression quiz. |
| 1. Describe rules relating to writing SQL queries
 | 1 | E-tivity 7.2 | On the LMS, based on marking and grading of the progression quiz. |
| 1. List and discuss the various ISO SQL data types
 | 1 | E-tivity 7.2 | On the LMS, based on marking and grading of the progression quiz. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Design relational database systems that are relevant to needs of a specific organisation /company. |
| Purpose of the unit/week/section: |
| The topic introduces you to the Structured Query Language (SQL) as a database language. You will comprehend on the two broad categories of SQL, namely, Data Definition Language (DDL) and Data Manipulation Language (DML). The topic will further outline the rules behind the writing and execution of SQL statements. |
| Over to you: *(a description of the process of the section)* |
| This section involves you looking through the learning resources and summarizing the chapters provided. Thereafter, you will work on the e-tivities to demonstrate whether you understood and internalized the content. |
| Pre-topic Activity |  Number of hours | 2 |
| A review of the entity relationship model is to be conducted. Based on the readings from week 6, attempt the practical exercises after chapter 10 and 12. The review will be done during the face-to-face activity. |
| Face to Face Activity | Number of hours | 1.5 |
| * Review of the pre-topic activity
* Review of expectations of e-tivity 7.1 and 7.2
* Think, pair, share on the concepts covered in the recorded lecture.
 |
| Online activity: | Number of hours | 5 |
| What should students do? | **E-tivity 7.1 (Mandatory)**This e-tivity will introduce you to the concepts of the SQL language. You are required to perform the following tasks:* The first task is reading through chapter 15 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook. As you go through the chapter, focus on the SQL concepts, and make short notes.
* The second task is to improve the short notes that you created on the first task by reading chapter 7 and 8 of the [Relational Database Systems](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook. These readings will aid in working on the discussion forum question.
* The third task involves watching a [video](https://youtu.be/bEtnYWuo2Bw) and highlighting points missed during the first and second summary.
* You have been assigned to a group of 5 members within the system. You are now required to engage your peers on the discussion question below:

A student from a background other than Computing has started learning SQL. Based on your readings from this week, what would you advise them to focus on so that they have a better understanding before they start coding?* When engaging with your peers, point out areas they may have left out or areas they included that you had not thought of. Ensure that you have enhanced your summary.

**E-tivity 7.2 (Mandatory)**Once you have posted and engaged with your peers in the discussion forum, you will be required to attempt a progression quiz. This quiz is aimed at checking whether you have understood the concepts from the week. You will be unable to proceed to week 8 until you pass all the questions in the quiz.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 7.1**1. Individually, post your response to the discussion question in the discussion forum.
2. Engage your peers on their posts within the discussion forum.

**E-tivity 7.2**Individually, attempt the progression quiz within the LMS |
| By when should they do it? | **E-tivity 7.1**1. Posting of response should be submitted by Thursday 23:59
2. Peer Reviews should be submitted by Saturday 23:59

**E-tivity 7.2**Progression quiz should be attempted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed through the progression quiz.  |
| How does this section link to other sections of the module? |
| The next e-tivity will explore Data Definition Language (DDL) as the first category of SQL |

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| Total number of hours |  8.5 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 15 on Structured Query Language.Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 7 and 8 on SQL and the Relational Model and SQL and 3-Schema Architecture. Watch the following video.* Introduction to SQL - <https://youtu.be/bEtnYWuo2Bw>
 |
| How are students enabled to access the resources? | Students enrolling on the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | E-tivity 7.1 - through the group discussion forum and peer review. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (think, pair, and share) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | Database Definition Language (Syntax and Creation of Database Objects) |
| Aim of the topic: | The topic aims to build you to be knowledgeable on creation of databases and their objects. It will introduce Database Definition Language that is designed purely for defining structural parts of a database without touching on the data. |
| This topic covers: | * The concepts behind creation of databases and their objects by exploring.
* The syntax used when writing and executing various DDL statements.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Comprehend the syntax for creation of database objects.
2. Create databases, tables, and views.
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| Overview of student activity: | 1. Watch the videos from the pre-topic activity.
2. Read chapter 15 (Database Design).
3. Read chapter 12 (Relational Database Concepts).
4. Summarize and reflect on the readings from a), b) and c).
5. Complete the face-to-face group mini case.
6. Complete E-tivity 8.1 which is a formative assessment.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Comprehend the syntax for creation of database objects
 | 2 | Face to Face Group Mini CaseE-tivity 8.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment |
| 1. Create databases, tables, and views
 | 2 | Face to Face Group Mini CaseE-tivity 8.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Design relational database systems that are relevant to needs of a specific organisation /company. |
| Purpose of the unit/week/section: |
| The topic covers concepts behind creation of databases and their objects. It clearly explores the syntax used when writing and executing various DDL statements. These will be achieved through real case scenarios. |
| Over to you: *(a description of the process of the section)* |
| This section involves you looking through the learning resources and summarizing the chapters provided. Thereafter, you will work on the e-tivities to demonstrate whether you understood and internalized the content. |
| Pre-topic Activity |  Number of hours | 1 |
| Based on the readings from week 7, attempt the practical exercises after chapter 15 on SQL. Ignore the DDL questions. A review of the same will be done during the face-to-face session.Furthermore, prepare your environment for practical activities by [downloading](https://www.microsoft.com/en-us/sql-server/sql-server-downloads) and [installing](https://docs.microsoft.com/en-us/sql/database-engine/install-windows/install-sql-server-from-the-installation-wizard-setup?view=sql-server-ver15) either the Developer or Express versions of the MS-SQL Server DBMS. Ensure that the installation completes successfully and that you can start the [SQL Server Management Studio (SSMS), connect to the database engine and open the query browser](https://youtu.be/moCgS2kfxnU) in readiness for writing and execution of SQL commands. |
| Face to Face Activity | Number of hours | 1.5 |
| * Review of the pre-topic activity
* Highlight concepts related to Data Definition Languages (DDL).
* Group discussion on a mini case study in line with the creation of databases and their objects.

***Mini case study****: A well-structured University is made up of Schools, headed by a Dean. Each School has one or more Departments that are headed by a Chairman. Chairs of departments report to the Dean of their School. Each department is composed of one or more programs. As a major requirement by the Commission of University Education, each program must have a program leader who is a subject matter expert. Deans, Chairs, and program leaders are members of faculty with extra responsibility for a specific period. They hence belong to a specific department within a School. Every faculty is identified by his/her PF number, name, gender, and area of speciality while departments and schools have unique names for ease of identification.****Task:*** *In reference to the 3NF for the mini case that was generated in week 6, create the database and its tables.* |
| Online activity: | Number of hours | 5 |
| What should students do? | **E-tivity 8.1 (Mandatory)**The purpose of this e-tivity is to comprehend writing and executing DDL statements for creating databases and their objects. You are required to perform the tasks listed below based on the running case and about the database and its tables as determined in e-tivity 6.1.**Task 1**Go through chapter 15 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook on Structured Query Language with a focus on DDL and chapter 12 of the [Relational Database Systems](https://www.oercommons.org/courses/relational-database-systems-why-and-how) - Why and How course textbook on The SQL Data Definition Language (DDL). You may also search for a YouTube video on writing and executing SQL statements. As you go through the materials, notate key points, and make summary notes of the same. The notation and summary should be based on a reflection of what you have understood and gained from the readings and the video. **Task 2**Bearing in mind the readings and any YouTube videos you managed to watch, attempt the following tasks based on running case:1. Create a database called “Tender Store”.
2. Create tables as determined by the 3NF for e-tivity 6.1.
3. Be sure to enforce relationships as determined by the key fields.

Capture the SQL statements executed plus the screenshots of the outcome in an MS-Word document for submission.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 8.1**Individually, submit the work as an assignment through the LMS. |
| By when should they do it? | **E-tivity 8.1**Assignment submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed by the face-to-face group mini case activity and the assignment. The assignment is graded through a rubric created by the instructor.  |
| How does this section link to other sections of the module? |
| The next e-tivity will build on the concepts learnt from this e-tivity by advancing on DDL concepts for the actual design of the database. |

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| Total number of hours | 7.5 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 15 on Structured Query Language with a focus on DDL. Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 12 on The SQL Data Definition Language (DDL).  |
| How are students enabled to access the resources? | Students enrolling on the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to face group mini case. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (mini case) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | DDL (Adding fields & Constraints and Deletion of Objects) |
| Aim of the topic: | The topic aims at expounding on previous week’s creation of databases and their objects by focusing on advanced concepts on Data Definition Language (DDL). It explores DDL statements for adding fields and constraints to existing tables and deletion of database objects. |
| This topic covers: | * Advanced DDL concepts for adding fields and constraints to tables.
* DDL statements for deleting databases and their objects.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Add and delete fields and constraints to existing tables.
2. Delete databases, tables, and views.
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| Overview of student activity: | 1. Read chapter 15 (Database Design).
2. Review chapter 12 (Relational Database Concepts).
3. Make short notes from a) and update as you review b).
4. Complete the face-to-face group mini case.
5. Complete E-tivity 9.1 which is a formative assessment.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Add and delete fields and constraints to existing tables
 | 2 | Face to Face Group Mini CaseE-tivity 9.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment |
| 1. Delete databases, tables, and views
 | 2 | Face to Face Group Mini CaseE-tivity 9.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| 1. Design relational database systems that are relevant to needs of a specific organisation /company.
2. Create databases and their objects using a contemporary database management system.
 |
| Purpose of the unit/week/section: |
| The topic expounds on week 8 creation of databases and their objects by focusing on advanced concepts of DDL statements for adding fields and constraints to tables. It further explores DDL statements for deleting databases and their objects. These will be achieved through real case scenarios. |
| Over to you: *(a description of the process of the section)* |
| We are now getting into the heart of SQL, specifically DDL. You will be doing a review of the reading resources then using the resources to work on the face-to-face activity as well as the e-tivity.  |
| Pre-topic Activity |  Number of hours | N/A |
| You should have successfully completed and understood week 8 activities.  |
| Face to Face Activity | Number of hours | 1.5 |
| * Review of the week 8 e-tivity.
* Highlight concepts related to DDL.
* Group discussion on a mini case study in line with DDL

***Mini case study****: A well-structured University is made up of Schools, headed by a Dean. Each School has one or more Departments that are headed by a Chairman. Chairs of departments report to the Dean of their School. Each department is composed of one or more programs. As a major requirement by the Commission of University Education, each program must have a program leader who is a subject matter expert. Deans, Chairs, and program leaders are members of faculty with extra responsibility for a specific period. They hence belong to a specific department within a School. Every faculty is identified by his/her PF number, name, gender, and area of speciality while departments and schools have unique names for ease of identification.****Task:*** *In reference to the tables created in week 8, add at least two fields of your choice to each table. Demonstrate deletion of at least one field from each table. Further demonstrate how to delete a table and a database.* |
| Online activity: | Number of hours | 5 |
| What should students do? | **E-tivity 9.1 (Mandatory)**Having managed to create database objects in week 8, it is now time to move toward executing statements on the objects we created. A focus of the e-tivity will be on adding and removing fields and deleting databases and their objects. The tasks will be performed individually and will be based on the running case. You will modify tables and their constraints and delete databases and tables as designed in e-tivity 8.1. You will perform the following tasks:* Read chapter 15 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook on Structured Query Language with a focus on DDL for adding table fields and constraints and deletion of database objects. Take note of concepts and DDL statements covered.
* Thereafter, review chapter 12 of the [Relational Database Systems](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook with a similar focus on adding table fields and constraints and deletion of database objects. Update the concepts and statements from the first task with any new discovered statements.
* Based on the concepts and statements you have unearthed from the two books attempt the running case tasks below:
1. Add at least two fields of your choice to each of the tables created in e-tivity 8.1.
2. Delete at least one field (not the one just added) from each of the tables created in e-tivity 8.1.
3. Add extra constraints of your choice to any table.

Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 9.1**Individually, submit the work as an assignment through the LMS |
| By when should they do it? | **E-tivity 9.1**Assignment submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N\A |
| The learning outcomes are assessed by the formative assessment which is in the form of a face-to-face group mini case activity and the assignment. The assignment is graded through a rubric created by the instructor.  |
| How does this section link to other sections of the module? |
| The next e-tivity will build on the concepts learnt from this e-tivity by introducing DML concepts for the actual design of the database. |

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| Total number of hours |  6.5 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 15 on Structured Query Language with a focus on DDL for adding table fields and constraints and deletion of database objects. Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 12 on The SQL Data Definition Language (DDL) with a focus on adding table fields and constraints and deletion of database objects.  |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to face group mini case. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (group mini case) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | Introduction to Data Manipulation Language (DML) |
| Aim of the topic: | The topic aims at introducing you to concepts behind writing and execution of Data Manipulation language (DML) SQL statements. The key focus is to introduce mechanisms on how to deal with data related statements that could allow for insertion, update, selection and deletion of data in database tables. |
| This topic covers: | * Syntax used when writing and executing various DML statements for inserting, updating, selecting, and deleting data.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Describe the syntax of the insert, update, select and delete statement.
2. Write and execute basic data manipulation language queries.
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| Overview of student activity: | 1. Read chapter 16 (Database Design).
2. Read chapter 9 (Relational Database Concepts).
3. Review the YouTube video on inserting data in the database.
4. Summarize and reflect on the readings from a) and b).
5. Complete the face-to-face group mini case.
6. Complete the tasks outlined in E-tivities 10.1 based on reflections from the readings.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Describe the syntax of the insert, update, select and delete statement
 | 3 | Face to Face Group Mini CaseE-tivity 10.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |
| 1. Write and execute basic data manipulation language queries
 | 3 | Face to Face Group Mini CaseE-tivity 10.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Demonstrate the use of data manipulation language to insert, update, query, and delete data in database tables |
| Purpose of the unit/week/section: |
| The topic introduces DML as the second category for database languages. It covers concepts behind writing and execution of data manipulation SQL statements. It clearly explores the syntax used when writing and executing various DML statements for inserting, updating, selecting, and deleting data. These will be achieved through real case scenarios. |
| Over to you: *(a description of the process of the section)* |
| This section involves you looking through the learning resources and summarizing the chapters provided. Thereafter, you will work on the e-tivities to demonstrate whether you understood and internalized the content.  |
| Pre-topic Activity |  Number of hours | 1 |
| A review of DDL is to be conducted. During week 8 you attempted the questions from chapter 15 on the relational model. This week, we focus on the same chapter on the DDL questions. Based on the readings from week 7 and 8 you, attempt the practical exercises after chapter 15 on DDL. The review will be done during the face-to-face activity. |
| Face to Face Activity | Number of hours | 1.5 |
| * Review of the pre-topic activity
* Highlight concepts related to DML.
* Group discussion on a mini case study in line with DML

***Mini case study****: A well-structured University is made up of Schools, headed by a Dean. Each School has one or more Departments that are headed by a Chairman. Chairs of departments report to the Dean of their School. Each department is composed of one or more programs. As a major requirement by the Commission of University Education, each program must have a program leader who is a subject matter expert. Deans, Chairs, and program leaders are members of faculty with extra responsibility for a specific period. They hence belong to a specific department within a School. Every faculty is identified by his/her PF number, name, gender, and area of speciality while departments and schools have unique names for ease of identification.****Task:*** *In reference to the tables created in week 8 and with modifications done on them in week 9, insert at least two records in each of the tables, display/retrieve the inserted records, update any of the records, delete any of the records.* |
| Online activity: | Number of hours | 5 |
| What should students do? | **E-tivity 10.1 (Mandatory):**The purpose of this e-tivity is to lay a foundation to Data Manipulation Language statements. For this e-tivity, you will be required to perform the tasks listed below based on the running case. You will as an individual insert, select (display), update and delete records in a database. **Task 1**Keeping in mind e-tivities 8.1 and 9.1 from the previous weeks and the background of the running case that created a database and its objects, you are expected to read chapter 16 of [Database Design](https://opentextbc.ca/dbdesign01/) course textbook on SQL Data Manipulation Language and chapter 9 of [Relational Database Concepts](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook on The SQL Data Manipulation Language (DML). Additionally, watch the [video](https://youtu.be/c9oxvokZMwk) on Data Manipulation Language (DML) provided in the learning resources. Capture key points discovered from the learning resources based on what you understood and gained from the readings and the video. **Task 2**Based on Task 1 activities and on the running case, write and execute SQL statements to perform the following activities in that order:1. Insert at least 10 records in each of the tables.
2. Display all records in each of the tables.
3. Modify any of the records in each table.
4. Display all records in each of the tables.
5. Remove one record from each of the tables.
6. Display all records in each of the tables.

Capture the SQL statements executed plus the screenshots of the outcome in an MS-Word document for submission.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 10.1**Individually, submit the work as an assignment through the LMS |
| By when should they do it? | **E-tivity 10.1**Assignment submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed by the face-to-face group mini case activity and the assignment. The assignment is graded through a rubric created by the instructor.  |
| How does this section link to other sections of the module? |
| The next e-tivity will build on the concepts learnt from this e-tivity by introducing DML concepts for the actual design of the database. |

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| Total number of hours |  7.5 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 16 on SQL Data Manipulation Language. Capture important notes.Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 9 on The SQL Data Manipulation Language (DML). Capture any additional points as an enhancement to what you captured in the previous textbook.Watch the following videos on Data Manipulation Language (DML)* + <https://youtu.be/c9oxvokZMwk>
	+ <https://youtu.be/5dszS8TxTJ4>
 |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to face group mini case. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (group mini case) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** |  |
| Topic name: | DML (WHERE clause, Sorting, Grouping & Functions) |
| Aim of the topic: | The topic aims to expound on week 10’s introduction to DML by focusing on a broad view of the WHERE clause for selecting and filtering data from the database. It further explores how to sort and group data using the select statement.  |
| This topic covers: | * A broad view of the WHERE clause for selecting and filtering data from the database.
* How to sort and group data using the select statement.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Write and execute data manipulation statements with the WHERE clause.
2. Perform sorting and grouping of results using the select statement.
3. Write and execute queries using SQL functions.
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| Overview of student activity: | 1. Read chapter 16 (Database Design).
2. Read chapter 9 (Relational Database Concepts).
3. Review the YouTube video on DML.
4. Summarize the readings from a), Update the summary with b) and c).
5. Complete the face-to-face group mini case.
6. Complete the tasks outlined in E-tivities 11.1 based on reflections from the readings.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Write and execute data manipulation statements with the WHERE clause
 | 3 | Face to Face Group Mini CaseE-tivity 11.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |
| 1. Perform sorting and grouping of results using the select statement
 | 3 | Face to Face Group Mini CaseE-tivity 11.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |
| 1. Write and execute queries using SQL functions
 | 3 | Face to Face Group Mini CaseE-tivity 11.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Demonstrate the use of data manipulation language to insert, update query and delete data in database tables |
| Purpose of the unit/week/section: |
| The week expounds on week 10’s introduction to DML by envisaging a wider view of the WHERE clause for selecting and filtering data from the database. It further explores how to sort and group data using the select statement. These will be achieved through real case scenarios. |
| Over to you: *(a description of the process of the section)* |
| After an introduction to DML during the previous week, you will now practice some activities with DML statements. |
| Pre-topic Activity |  Number of hours | N/A |
| For you to be able to undertake the face-to-face activities, it is prudent for you to review the lessons learnt from week 10. Catch up on any e-tivities you may have missed.  |
| Face to Face Activity | Number of hours | 1.5 |
| * Review of concepts related to DML from week 10 and 11.
* Work on a group discussion of a mini case study regarding DML.

***Mini case study****: A well-structured University is made up of Schools, headed by a Dean. Each School has one or more Departments that are headed by a Chairman. Chairs of departments report to the Dean of their School. Each department is composed of one or more programs. As a major requirement by the Commission of University Education, each program must have a program leader who is a subject matter expert. Deans, Chairs, and program leaders are members of faculty with extra responsibility for a specific period. They hence belong to a specific department within a School. Every faculty is identified by his/her PF number, name, gender, and area of speciality while departments and schools have unique names for ease of identification.****Task:*** *In reference to records inserted in tables in week 10, demonstrate the use of WHERE clause, Sorting, Grouping and Functions on the data as guided by the instructor.* |
| Online activity: | Number of hours | 5 |
| What should students do? | **E-tivity 11.1(Mandatory)**This week, we will be focusing on the WHERE clause, sorting, grouping and functions for data filtering. You will be required as an individual to perform the tasks listed below. Keep in mind the review from week 10.* Read chapter 16 of the [Database Design](https://opentextbc.ca/dbdesign01/) course textbook on SQL Data Manipulation Language and capture important concepts regarding DML.
* After you finish the first task, review chapter 9 of the [Relational Database Systems](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook on The SQL Data Manipulation Language (DML). Update the concepts from the first task.
* Watch the [video](https://youtu.be/vxlD94G0Geo) on Data Manipulation Language (DML) provided in the learning resources and capture any other additional concepts you deem worthy that were not captured in the first and second task.
* After completing the first three tasks, attempt the running case tasks below:
	1. Write and execute statements to display all records in each table.

Capture the SQL statements executed plus the screenshots of the outcome in an MS-Word document for submission.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 11.1**Individually, submit the work as an assignment through the LMS |
| By when should they do it? | **E-tivity 11.1**Assignment submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed by a formative assessment made of the face-to-face group mini case activity and the assignment. The assignment is graded through a rubric created by the instructor.  |
| How does this section link to other sections of the module? |
| The next e-tivity will build on advanced DML concepts learnt from this e-tivity by exploring the use and application of subqueries and multi-table querying with or without the use of JOINs. It will also cover the aspect of combining table results using Union, Intersect and Except. |

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| Total number of hours |  6.5 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 16 on SQL Data Manipulation Language. Capture important notes.Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 9 on The SQL Data Manipulation Language (DML). Capture any additional points as an enhancement to what you captured in the previous textbook.Watch the following video on Data Manipulation Language (DML) WHERE clause<https://youtu.be/vxlD94G0Geo>  |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to face group mini case. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (group mini case) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** | 1.
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| Topic name: | DML (Subqueries, JOINs & Advanced Topics) |
| Aim of the topic: | The aim of the topic is to expose you to advanced concepts for data filtering by exploring how to write and execute SQL statements that embrace subqueries and multi-table querying with or without the use of JOINs. It also explores the process of combining table results using Union, Intersect and Except set operations. |
| This topic covers: | * Advanced concepts for data filtering including subqueries and multi-table querying with or without the use of JOINs.
* The process of combining table results using Union, Intersect and Except.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Write and execute SQL statements containing subqueries.
2. Describe and perform multi-table querying with or without the use of JOINs.
3. Describe the process of combining table results using Union, Intersect and Except.
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| Overview of student activity: | 1. Read chapter 16 (Database Design).
2. Read chapter 9 (Relational Database Concepts).
3. Review the YouTube video on an introduction to databases.
4. Summarize and reflect on the readings from a) and b).
5. Complete the face-to-face group mini case.
6. Complete the tasks outlined in E-tivities 12.1 based on reflections from the readings.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Write and execute SQL statements containing subqueries
 | 3 | Face to Face Group Mini Case E-tivity 12.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |
| 1. Describe and perform multi-table querying with or without the use of JOINs
 | 3 | Face to Face Group Mini Case E-tivity 12.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |
| 1. Describe the process of combining table results using Union, Intersect and Except
 | 3 | Face to Face Group Mini Case E-tivity 12.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Demonstrate the use of data manipulation language to insert, update query and delete data in database tables |
| Purpose of the unit/week/section: |
| The week exposes the students to advanced concepts for data filtering by exploring writing and execution of subqueries and multi-table querying with or without the use of JOINs. It further explores the process of combining table results using Union, Intersect and Except. These will be achieved through real case scenarios. |
| Over to you: *(a description of the process of the section)* |
| This section involves you looking through the learning resources and summarizing the chapters provided. Thereafter, you will work on the e-tivities to demonstrate whether you understood and internalized the content. |
| Pre-topic Activity |  Number of hours | 1 |
| The student should have successfully completed week 11 activities |
| Face to Face Activity | Number of hours | 1.5 |
| * Highlight concepts related to DML.
* Group discussion on a mini case study in line with DML.

***Mini case study****: A well-structured University is made up of Schools, headed by a Dean. Each School has one or more Departments that are headed by a Chairman. Chairs of departments report to the Dean of their School. Each department is composed of one or more programs. As a major requirement by the Commission of University Education, each program must have a program leader who is a subject matter expert. Deans, Chairs, and program leaders are members of faculty with extra responsibility for a specific period. They hence belong to a specific department within a School. Every faculty is identified by his/her PF number, name, gender, and area of speciality while departments and schools have unique names for ease of identification.****Task:****In reference to records inserted in tables in week 10, demonstrate the application of subqueries and JOINs on the data as guided by the instructor.* |
| Online activity: | Number of hours | 6.5 |
| What should students do? | **E-tivity 12.1 (Mandatory):**The purpose of this e-tivity is to explore advanced Data Manipulation Language concepts. For this e-tivity, you will be required as an individual to perform the tasks listed below based on the running case. **Task 1**Keeping in mind e-tivity 10.1 from the previous week that was based on the background of the running case that inserted records in all table of the database and in reference to week 11 exercises that introduced data filtering concepts, you are now required to go through chapter 16 of [Database Design](https://opentextbc.ca/dbdesign01/) course textbook on SQL Data Manipulation Language and chapter 9 of the [Relational Database Concepts](https://www.oercommons.org/courses/relational-database-systems-why-and-how) course textbook on The SQL Data Manipulation Language (DML). Additionally, watch YouTube [video 1](https://youtu.be/GpC0XyiJPEo), [video 2](https://youtu.be/7h9uuILngp0), [video 3](https://youtu.be/TGt2xa7EzvI) and [Video 4](https://youtu.be/krnAfIHqGzI) on sub querying, multi-table querying, and set function Data Manipulation Language (DML) provided in the learning resources. Capture critical points discovered from the learning resources based on what you understood and gained from the readings and the video. **Task 2**Based on the readings and video covered in Task 1 and in relation to the running case, write and execute SQL statements to:1. Display all records from all the tables without using JOINs.
2. Repeat the previous tasks using JOINs.
3. On your own, demonstrate the use of Union, Intersect and Except on the data in the database. Be sure to explain and justify your demonstration.

Capture the SQL statements executed plus the screenshots of the outcome in an MS-Word document.Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 12.1**Individually, submit the work as an assignment through the LMS |
| By when should they do it? | **E-tivity 12.1**Assignment submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed by the face-to-face group mini case activity and the assignment. The assignment is graded through a rubric created by the instructor.  |
| How does this section link to other sections of the module? |
| The next e-tivity will introduce a foundational aspect to database administration as we head towards wrapping up the course. |

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| Total number of hours |  9 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watt, A., and N. Eng. (2014). Database Design – 2nd Edition. Victoria, B.C. Retrieved from <https://opentextbc.ca/dbdesign01/> :Read chapter 16 on SQL Data Manipulation Language. Capture important notes.Ron Rogerson (2019), “Relational Database Systems - Why and How”. OER Commons. Howard Rogerson Associates. Retrieved from <https://www.oercommons.org/courses/relational-database-systems-why-and-how> on 15 Oct. 2020:Read chapter 9 on The SQL Data Manipulation Language (DML). Capture any additional points as an enhancement to what you captured in the previous textbook.Watch the following Videos on Advanced DML concepts:* Sub querying: <https://youtu.be/GpC0XyiJPEo>
* Multi Table querying without JOINS: <https://youtu.be/7h9uuILngp0>
* Multi Table querying with JOINS: <https://youtu.be/TGt2xa7EzvI>
* Set Function: <https://youtu.be/krnAfIHqGzI>
 |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to Face Group Mini Case. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (group mini case) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** | 1.
 |
| Topic name: | Database Administration |
| Aim of the topic: | The topic aims to lay a foundation to database administration for beginners. It exposes you to the basic concepts for database administration with demonstrations the application of database administration. |
| This topic covers: | * The concept of database administration.
* The roles of a database administrator.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Describe basic concepts for database administration.
2. Demonstrate the application of basic database administration.
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| Overview of student activity: | 1. Watch the YouTube video on Database administration.
2. Create a mind map based on the video.
3. Update the mind map based on an internet search.
4. Complete the tasks outlined in E-tivities 13.1 based on the mind map.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Describe basic concepts for database administration
 | 4 | E-tivity 13.1 | On the LMS, based on marking and grading of the assignment. |
| 1. Demonstrate the application of basic database administration
 | 4 | E-tivity 13.1 | On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Describe and demonstrate basic database administration and database security management. |
| Purpose of the unit/week/section: |
| The week covers concepts of database administration. It explores the application of basic database administration concepts. This lays a foundation for beginners in database administration. |
| Over to you: *(a description of the process of the section)* |
| This section involves you looking through the learning resources and making short notes of what you have learned. Thereafter, you will work on the e-tivities to demonstrate whether you understood and internalized the content. |
| Pre-topic Activity |  Number of hours | N/A |
| Students need to have covered all the preceding topics of the course |
| Face to Face Activity | Number of hours | 1.5 |
| * Question and Answer session based on the weeks’ notes.
* Think, pair, share on the concepts covered in the YouTube video.
 |
| Online activity: | Number of hours | 6.5 |
| What should students do? | **E-tivity 13.1 (Mandatory)**This e-tivity is set to estimate your understanding of the requirements for database administration. You are required to undertake the following tasks:**Task 1*** Watch the [video](https://www.youtube.com/watch?v=BPkNd41RPtQ) provided for this week that gives an overview to database administration. As you watch this video, create a mind map that outlines the various facets of database administration. You should also identify different users required to administrator a database as you add them to your mind map.
* Do an internet search on the various real-life applications of databases. Using the mind map you have created, notate it as you show the applications you unearthed during your internet search.
* Take an image or snip the mind map that you have created and post it in the discussion forum.

**Task 2*** Based on the student groupings from the previous week, review your peers’ mind maps. The following questions should guide you in the peer review:
	1. Are there roles within database administrations that you overlooked? Which ones?
	2. What are the main differences between your post and your peers regarding the applications of database administration?

**Task 3*** Having concluded Task 1 and Task 2 above, enhance your mind map with comments provided by your peers and your observations from your peers’ mind maps. Place an image of your initials mind map and the enhanced mind map in an MS-Word document for submission. Be sure to label the two mind maps appropriately for the instructor to differentiate them.

Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 13.1** 1. Individually, post your summary in the discussion forum.
2. Post the reviews for your colleagues’ post in the discussion forum.
3. Individually, submit the final work as an assignment through the LMS.
 |
| By when should they do it? | **E-tivity 13.1**1. Summaries and Reflections should be submitted by Wednesday 23:59
2. Peer Reviews should be submitted by Friday 23:59
3. Assignment submitted by Sunday 23:59
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| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed based on the posted mind maps and the reviews by the peers. |
| How does this section link to other sections of the module? |
| The next e-tivity will build on the summary made in e-tivity 13.1 by exploring threats to database security with their countermeasures. |

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| Total number of hours |  8 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Watch the Basics of Database Administration Video: <https://www.youtube.com/watch?v=BPkNd41RPtQ> |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | E-tivity 13.1 – through the peer review process. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (think, pair, and share) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

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| **Unit-level overview** | **Week** | 1.
 |
| Topic name: | Database Security |
| Aim of the topic: | The topic aims to introduce you to foundational elements of database security. This is a continuation of the previous topic on database administration. The focus is on exploring database security threats and their countermeasures, as part of database administration. |
| This topic covers: | * The concept of database security.
* Database security threats
* Countermeasures to the identified database security threats.
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Describe security threats relating to databases.
2. Discuss and demonstrate the application of countermeasures to database security threats.
 |

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| Overview of student activity: | 1. Skim read through the Database Security book.
2. Review the YouTube video on an introduction to databases.
3. Summarize and reflect on the content from a) and b).
4. Complete the tasks outlined in E-tivity 14.1 based on reflections from the readings.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Describe security threats relating to databases
 | 4 | E-tivity 14.1 | On the LMS, based on marking and grading of the assignment. |
| 1. Discuss and demonstrate the application of countermeasures to database security threats
 | 4 | Face to Face Group Mini CaseE-tivity 14.1 | Completion of the group mini case and review during the face-to-face session.On the LMS, based on marking and grading of the assignment. |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place.  So, if students do work* online *before* *coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document.  If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Describe and demonstrate basic database administration and database security management. |
| Purpose of the week: |
| The week covers database security as part of database administration. It explores and demonstrates the application of basic database security. This enhances the knowledge gained last week on database administration by bringing in a security administration perspective. |
| Over to you: *(a description of the process of the section)* |
| The previous week focused on database administration. This week is a follow up by looking at database security. While this topic is the last, it is equally important for its aim is to learn about how to secure databases, as part of database administration. |
| Pre-topic Activity |  Number of hours | 1 |
| You will need to have completed the activities from the database administration week (13) and understood the concepts. If needed, you may review the week content again to ensure a thorough understanding. |
| Face to Face Activity | Number of hours | 1.5 |
| * Highlight concepts related to database security.
* Group discussion on a mini case study in line with database security.

***Mini case study****: A well-structured University is made up of Schools, headed by a Dean. Each School has one or more Departments that are headed by a Chairman. Chairs of departments report to the Dean of their School. Each department is composed of one or more programs. As a major requirement by the Commission of University Education, each program must have a program leader who is a subject matter expert. Deans, Chairs, and program leaders are members of faculty with extra responsibility for a specific period. They hence belong to a specific department within a School. Every faculty is identified by his/her PF number, name, gender, and area of speciality while departments and schools have unique names for ease of identification.****Task:*** *Demonstrate how:*1. *Database backups can be performed.*
2. *User access rights can be allocated and removed from users on database objects.*
 |
| Online activity: | Number of hours | 6.5 |
| What should students do? | **E-tivity 14.1 (Mandatory)**:This week we have concentrated on database security. As an individual, you will perform the tasks listed below based on the running case. At this point, you must appreciate the power of the running case that has been a successive build up on the e-tivities leading to this final e-tivity. **Task 1**A new learning resource “[Database Security](https://www.oercommons.org/authoring/21950-database-security)” has been provided to you for this week’s e-tivity. You may be fascinated with the concepts and terminologies presented in the book. Skim read through the book as you summarize and capture important concepts. The aim is not to replicate the notes but to note unique points of interest.**Task 2**Based on what you have learnt through task 1 and about the database that we have been building throughout the course, perform the following:1. Schedule a differential database backup to be occurring every day at midnight.
2. Schedule a full database backup to be occurring every after 7 days at midnight.
3. Create a user called “viewer”. Assign the user read only rights to any one of the tables in the database.
4. Remove the read only rights from the user on the initially assigned table.

Be sure to capture any SQL statements executed plus the screenshots of the steps and outcomes in an MS-Word document for submission. Based on your submission, the instructor will extract key aspects and will give feedback to you. Keep a copy of your work in your e-portfolio folder. |
| Where do they do it? | **E-tivity 14.1** Individually, submit the work as an assignment through the LMS.  |
| By when should they do it? | **E-tivity 14.1**Assignment submitted by Sunday 23:59 |
| E-moderator/tutor role |
| Ensure that they select and record vital/critical aspects of the lecture for better topic understanding.Direct the students and get their understanding of the week’s lessons.Aid in the week’s activity to prepare the students for the week’s activity. Review the students' work, give meaningful feedback, and provide opportunities for improvement.  |
| How are the learning outcomes in this unit assessed? |  Number of hours | N/A |
| The learning outcomes are assessed based on the face-to-face group mini case activity and the assignment. The assignment is graded through a rubric created by the instructor.  |
| How does this section link to other sections of the module? |
| This marks the end of e-tivities for the course. The next section will require you to provide feedback in the form of a reflection for the entire course. |

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| Total number of hours | 9 |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | Narasimhan, G. (2017, May 12). Database Security. OER Commons. Retrieved October 15, 2020, from<https://www.oercommons.org/authoring/21950-database-security>.Skim read through the textbook with a focus on threats to database security and their countermeasures. Capture important notes in a manner of your choice. |
| How are students enabled to access the resources? | Students enrolling into the LMS to get access to the learning resources. |
| Where in this unit are students expected to work collaboratively? | Face to Face group mini case. |
| How has an inclusive approach been incorporated in this unit? | Group work activities and interaction (group mini case) during face-to-face activity. |
| How will feedback on unit be obtained from students? | For the entire module, open feedback will be given during the discussion forum sessions while anonymous feedback will be gathered through use of an online survey. |
| How will student feedback be used to improve unit? | The feedback will be used to improve on the next topics and for future unit offering. |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | Formative feedback will be provided at least one week after submission of the assignments. |

END OF UNIT/WEEK/SECTION-LEVEL TEMPLATE

**Note**

The module was designed with respect to the Africa Nazarene University teaching and learning context. Hence, the following conditions were used:

1. A class size of 40 to 100 students.
2. Not all learners have access to stable internet and power supply.
3. A semester of 14 weeks of learning, and two weeks of exams

Hence, any person or institution opting to adopt the module, may opt to customise the module to fit conditions applicable to their context.