Project Specification

Qualification	Faculty of Information Technology Bachelor of Science in Information Technology		
Module code	ITDA310	**Module name**	Advanced Database Systems
Semester	1/2018	**Year**	2018
Module lead	K Mpwampu	**Internal moderator**	-
Total marks	150		
Issue date	05/02/2018 - 09/02/2018	**Submission date**	14/05/18 - 18/05/18

The CTI policy on credit accumulation and transfer must be aligned to the Council on Higher Education's policy on the recognition of prior learning, credit accumulation and transfer, and assessment in higher education.

The outcome of this alignment means that CTI students who have entered into certificate studies with a National Senior Certificate (NSC) for further studies at higher certificate or diploma level will no longer receive credits for any modules completed on the Higher Certificate towards the Bachelor Degree.

Students will have to enrol for the full year of studies.

The following will however apply in 2017 to the modules for which students would have previously received credits:

- Students will have to be registered for the modules but will not pay a tuition fee.
- Students will not be expected to attend class.
- In order for the student to pass the module they will have to submit and pass a project at the end of the semester.

Instructions to the student

- Remember to keep a copy of all submitted projects.
- All work must be typed.
- Please note that you will be evaluated on your writing skills in all your projects.
- Negative marking will be applied if you are found guilty of plagiarism, poor writing skills or if you have applied incorrect or insufficient referencing.
- Each project must include a cover page, table of contents and full bibliography, based on the Harvard Referencing Style as applied at CTI Education Group.
- Use the cover sheet template[1] for the project. This is available from your lecturer.
- Students are **not** allowed to offer their work for sale or to purchase the work of other students. This includes the use of professional project writers and websites, such as Essay Box. If this should happen, CTI Education Group reserves the right **not** to accept future submissions from a student.

Project format

Students must follow the generic requirements when writing and submitting projects as follows:

- Use standard Arial, font size 10.
- Include page numbers.
- Include a title page.
- Print submissions on both sides of the page.
- Write no more than the maximum word limit.
- Ensure any diagrams, screenshots and PowerPoint presentations fit correctly on the page and are referenced.

1 Available on myLMS.

- Include a table of contents.
- Use accurate Harvard referencing throughout the project.
- Include a bibliography based on Harvard Referencing System at the end of the project.
- Include completed Assignment Front Cover Sheet and Statement and Confirmation of Own Work (available on MyLMS).
- Check spelling, grammar and punctuation.
- Run the project through Turnitin software.
- Students must keep copies of all submitted work.

Essential embedded knowledge and skills required of students
- Report-writing skills
- Ability to analyse scenarios/case studies
- Understanding of subject field concepts and definitions
- Ability to apply theoretical knowledge to propose solutions to real-world problems
- Referencing skills (Harvard Referencing Method)

Resource requirements
- A device with Internet access for research
- A desktop or PC for typing projects
- Access to a library or resource centre
- Prescribed reading resources

Delivery requirements (evidence to be presented by students)

A typed project[2]
A functional database that has been integrated with a third party application or website.

Minimum reference requirements
At least fifteen references for third year.

Additional reading is required to complete this project successfully. You need to include the following additional information sources:

- Printed textbooks/e-books
- Printed/online journal articles
- Periodical articles (e.g. business magazine articles)
- Information or articles from relevant websites
- Other information sources, e.g. geographic information (maps), census reports, interviews, etc.

Note
• It is crucial that students reference **all** consulted information sources, by means of in-text referencing and a bibliography, according to the Harvard referencing style. • Negative marking will be applied if a student commits plagiarism (i.e. using information from information sources without acknowledgement and reference to the original source). • In such cases, **negative marking**, also known as '**penalty scoring**', refers to the practice of subtracting marks for insufficient/incorrect referencing. • Consult the table at the end of this document, which outlines how negative marking will be applied as well as the way in which it will affect your project mark.

2 Refer to the **CTI Conditions of Enrolment** for more guidance (available on myLMS).

Assessment criteria

The following criteria are assessed in this project:

LO1	Demonstrate a thorough understanding of principles, functioning and applications of distributed database management systems	**Question no.**
1.1	Demonstrate how to use entity- relationship (ER) modelling in database design as well as the basic concepts associated with the ER model.	1.1a
1.2	Demonstrate how to use relational integrity rules, including entity and referential integrity in a distributed database management system	1.1a
LO2		**Question no.**
2.1	Discuss the scope of database security; compare and contrast the types of threat that may affect a distributed database system	1.2a, 2.1
2.2	Compare and contrast a range of computer-based controls that are available as countermeasures to such threats	1.2a, 1.2b, 2.2
2.3	Compare and contrast security measures associated with database systems and the web	2.2
2.4	Compare and contrast concurrency controls and examine the protocols that can be used to prevent conflict	2.3
2.5	Compare and contrast database recovery options and examine the techniques that can be used to ensure a distributed database remains in a consistent state in the presence of failures	2.4
LO3		**Question no.**
3.1	Produce an optimised logical and physical design for a database of advanced complexity	1.1a
3.2	Develop and build the relational database	1

Question 1 — 80 Marks

Based on the scenario below, complete the questions that follow:

Integrate mySQL to an application/ website

Using any language of your choice, design an application/ website for either a **library**, **bookshop, online dating site** or a cinema.

1.1 Develop and build a relational database that would integrate with the application/ website chosen from the scenario above.

a. Produce a conceptual design for the database. This should include the Entity – Relationship diagrams as well as the relevant integrity constraints.
(10 marks)

b. Produce an optimised logical and physical design for the database.
(20 marks)

c. Produce a fully functional database.
(20 marks)

1.2 Define the users of the database above.

a. Assign roles to the users of the database.
(10 marks)

b. Based on the roles assigned, assign global and schema privileges to the database users.
(20 marks)

Question 2 — 70 Marks

2.1 In Bophelo Hospital in Tembisa, patient data is stored on an Oracle SQL database that is stored on-site. In the last year, there have been numerous power outages in the environs surrounding Tembisa. In addition to this, there have been reports of ransomware affecting patient data in some hospitals in Gauteng. Critically analyse all possible threats to the Bophelo Hospital patient data.

(15 marks)

2.2 For each threat discussed in 2.1, discuss the possible countermeasures.

(15 marks)

2.3 Justify with examples the statement "Concurrency control is important to maintaining the integrity of a database".

(20 marks)

2.4 At a recent board meeting, Tsakani Retail Outlets approved the design and implementation of a database that would store its product information as well as information about its clients. At the same board meeting, you were appointed as the Project Lead in charge of the design and implementation of the database. The CEO has asked that as part of the preparation for implementation, you prepare a TWO (2) part report covering the following issues: **"The possible causes of database failure"** and **"Database recovery techniques"**

(20 marks)

You have now reached the end of this assignment. Ensure that you have answered all the required questions before submitting your assignment to your lecturer and ensure that you have adhered to all the instructions within this assignment.

Negative marking

Third-year students

- A minimum of 15 additional information sources must be consulted and correctly cited.
- If no additional information sources have been used, a full 15% must be deducted.
- Deduct 1% per missing resource of the required 15. For example:
  - If only five resources cited, deduct 10%
  - If only three resources cited, deduct 12%
- Markers must interpret the Turnitin report to determine actual Overall Similarity Index percentage.
- Markers to apply the penalties for Category A for insufficient sources and incorrect referencing style.
- Markers to apply the penalties/actions for Category B for plagiarism.

Category A

Minimum reference requirements	**Deduction of final mark**
No additional information sources have been used or referenced	15%

Category B: Interpretation of Turnitin report

Students may not have more than a 15% Overall Similarity Index on Turnitin, after analysis of the report.

Interpretation of Turnitin Originality Report	
Lecturer to capture the following	
1.	Original Overall Similarity Index (percentage) of Turnitin report
2.	Overall Similarity Index (percentage) after lecturer analysis of Turnitin report (to determine legitimate plagiarism)

Penalties		**Action**
a.	Less than 15% of the body of assessment (based on Point 2 above)	No action. Mark according to memorandum
b.	More than 15% of the body of assessment and first offence (based on Point 2 above)	Award 0% for the assignment
c.	If more than 70% of the body of assessment	Award 0% and conduct disciplinary hearing