

Course Outline

BIWD313-Data Warehousing

COURSE DETAILS

Faculty	: Information and Communication Technology
Programme	: BSc (Hons) in Software Engineering
Year/ Semester	: Year 3 Semester 1
Lecturer	: Mr Makheka
Principal Lecturer	: Ms Molapo
Pre-requisite	: Database Systems
Co-requisite	: None
Methods of Delivery	: Lectures and Tutorials sessions
Credits	: 3
Contacts hours	: 3 (2hours lecture +1 hour tutorial)
No. of weeks	: 17 weeks long Semester (12 teaching, 1 midterm, 1 Non-Contact 1 Revision, 2 Final Exams)
No. of class tests	: 2
No. of exams	: 1
Portfolio	: None
Venue	: Multimedia 4
Day	: Thursday
Time	: 11:30- 14:30

Prepared by : Mr. Makheka Checked by : Ms. Molapo

Signature :  Date 14/8/2019 Signature :  Date 14/8/2019

This document comprises the following:

- Essential Information
- Specific Course Information
- Course Rules & Regulations
- Grades
- Plagiarism
- Course Introduction
- Course Aims & Objectives
- Learning Outcome
- Specific Generic Learning Skills
- Syllabus + Lecture Outline
- References
- Assignment Schedule
- Assessment Criteria
- Specific Criteria

Other documents as follows will be issued to you on an ongoing basis throughout the semester:

- Handouts for Assignments
- Submission Requirements + Guidelines

1.0 ESSENTIAL INFORMATION

- All courses other than electives are '**significant courses**'
- As an indicator of workload one credit carries an additional 2 hours of self study per week. For example, a course worth 3 credits require that the student spends an additional 6 hours per week, either reading, completing the assignment or doing self directed research for that course.
- Submission of ALL assignment work is compulsory in this course. A student cannot pass this course without having to submit ALL assignment work by the due date or an approved extension of that date.
- All assignments are to be handed on time on the due date. Students will be penalized **10 percent** for the first day **and 5 percent per day** thereafter for late submission (a weekend or a public holiday counts as one day). Late submission, after the date Board of Studies meeting will not be accepted.
- Due dates, compulsory assignment requirements and submission requirements may only be altered with the consent of the majority of students enrolled in this course at the beginning/early in the program.
- Extensions of time for submission of assignment work may be granted if the application for extension is accompanied by a medical certificate.
- Overseas travel is not an acceptable reason for seeking a change in the examination schedule.
- **Only the Head of School can grant approval for extension of submission beyond the assignment deadline.**
- **Re-submission** of work can only receive a **50% maximum pass rate**.
- Supplementary exams can only be granted if the level of work is satisfactory AND the semester work has been completed.
- **Harvard referencing and plagiarism policy will apply on all written assignments.**

2.0 SPECIFIC COURSE INFORMATION

- Attendance rate of 80% is mandatory for passing course.
- All grades are subject to attendance and participation.
- Absenteeism at any scheduled presentations will result in zero mark for that presentation.
- Visual presentation work in drawn and model form must be the original work of the student.
- The attached semester program is subject to change at short notice.

3.0 COURSE RULES AND REGULATIONS:

Assessment procedure:

- These rules and regulations are to be read in conjunction with the UNIT AIMS AND OBJECTIVES
- All assignments/projects must be completed and presented for marking by the due date.
- Marks will be deducted for late work and invalid reasons.

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- All assignments must be delivered by the student in person to the lecturer concerned. No other lecturer is allowed to accept students' assignments.
- All tests/examinations are compulsory.
- Students must sit the test/examination on the notified date.
- Students are expected to familiarize themselves with the test/examination timetable.
- Students who miss a test/examination will not be allowed to pass.
- Any scheduling of tutorials, both during or after lecture hours, is TOTALLY the responsibility of each student. Appointments are to be proposed, arranged, confirmed, and kept, by each student. Failure to do so in a professional manner may result in penalty of grades. Tutorials WITHOUT appointments will also NOT be entertained.
- Note that every assignment is given an ample time frame for completion. This, together with advanced information pertaining deadlines gives you NO EXCUSE not to submit assignments on time.

4.0 GRADES

All modules and assessable projects will be graded according to the following system. With respect to those units that are designated 'Approved for Pass/Fail' the grade will be either PA or F:

Grade	Numeric Grade	Description
90 – 100	A+	
85 – 89	A	Pass with Distinction
80 – 84	A-	
75 – 79	B+	
74 – 70	B	Pass with Credit
65 – 69	B-	
60 – 64	C+	
55 – 59	C	Pass
50 – 54	C-, PX,	
0 – 49	F	Fail
	EXP	Exempted
	PP (45-49)	Pass Provisional with extra work needed
	PX	Pass after extra work is given and passed
	X	Ineligible for assessment due to unsatisfactory attendance
	D	Deferred
	W	Withdraw
	DNA	Did Not Attend Course
	DNC	Did Not Complete Course

5.0 PLAGIARISM, COPYRIGHT, PATENTS, OWNERSHIP OF WORK: STUDENT MAJOR PROJECT, THESES & WORKS

5.0.1 Academic Dishonesty

Academic Dishonesty or academic misconduct is any type or cheating that occurs in relation to a formal academic exercise. It can include:

Plagiarism: *The adoption or reproduction of original creations of another author (person, collective, organization, community or other type of author, including anonymous authors) without due acknowledgement.*

Fabrication: *The falsification of data, information or citations in any formal academic exercise.*

Deception: *Providing false information to an instructor concerning a formal academic exercise – e.g. giving a false excuse for missing a deadline or falsely claiming to have submitted work*

Cheating: *Any attempt to give obtain assistance in a formal academic exercise (like an examination) without due acknowledgement.*

Bribery: *or paid services. Giving certain test answers for money.*

Sabotage: *Acting to prevent others from completing their work. This includes cutting pages out of library books or wilfully disrupting the experiments of others.*

Students involved in academic dishonesty will be treated as follows:

1. *Plagiarism and fabrication in Assignments, Projects or Presentations: A zero (0) mark will be awarded to the work.*
2. *Deception: 10 % will be deducted on the first day of late submission and 5% a day thereafter. Late submission on or after BOS will not be accepted.*
3. *Cheating: Any form of assistance is a test will be rewarded a zero (0) mark. While in an examination the student automatically repeats the module.*
4. *Bribery, Sabotage or Professional Misconduct: Committing any of these offenses will lead to discontinuity from the University for a certain period depending on the seriousness of the offence.*

5.0.2 Copyright, Patents and Ownership of Work

All use of the borrowed work, whether text or images must be referenced and acknowledged. Limkokwing is not liable for any infringement of copyright within students' work. Students are to abide by International Copyright laws. Students engaged in a project activities will be required, as a condition of acceptance as a student, to agree to assign to Limkokwing their right, title and interest in any invention or visual work arising from their studies with the University. Limkokwing has the right to keep students work for use in archives, exhibitions and events. Where students wish to keep original work they must apply in writing and gain permission from the Academic Management.

6.0 COURSE INTRODUCTION

This course gives an introduction to methods and theory for development of data warehouses and data analysis using data mining. Data quality and methods and techniques for preprocessing of data. Modeling and design of data warehouses. Algorithms for classification, clustering and association rule analysis. Practical use of software for data analysis.

7.0 COURSE AIMS AND OBJECTIVES

The objectives of the course are to introduce the concept of data warehouse, and to understand each component or building block that makes up a data warehouse

- Provide a solid introduction to the topic of Data Warehousing.
- Show the difference between database and data warehousing.
- Introduce the ETL Model.
- Use the Star Schema to design a Data Warehouse.

8.0 LEARNING OUTCOMES

After completing this course, the student should demonstrate the knowledge and ability to:

- Design a data warehouse or data mart to present information needed by management in a form that is usable for management clients.
- Implement a high quality data warehouse or data mart.
- Effectively administer a corporate data resource in such a way that it will truly meet management's needs.
- Evaluate standards and new technologies to determine their potential impact on your information resource.

9.0 SPECIFIC GENERIC LEARNING SKILLS

Upon completion of the Course, student will acquire skills in:

- Students will be familiar with technologies used to develop and deploy data warehouse systems.
- Students will be able to analyze business requirements across multiple disciplines and address these requirements with appropriate data warehousing technologies
- Students will have the ability to identify and manage data warehouse operational, Technical, and user metadata.
- Students will have the ability to extract and document a business process and
- Translate it into a dimensional model.

10.0 UNIT SYLLABUS + LECTURE OUTLINE:

Week:

1

LECTURE 1:

INTRODUCTION TO DATA WAREHOUSING AND DATA MINING

Lecture Synopsis:

Data Warehousing – The only viable solution

Data Warehouse defined

Data Warehousing – The only viable solution

Data Warehouse defined

Handout:

Course outline and PowerPoint handouts

Week:

2

LECTURE 2:

DATA WAREHOUSE: THE BUILDING BLOCKS

Lecture Synopsis:

Defining Features

Data Warehouses and Data Marts

Overview of the Components

Metadata in the Data Warehouse

Handout:

N/A

Week:

3

LECTURE 3:

ARCHITECTURAL COMPONENTS

Lecture Synopsis:

UNDERSTANDING DATA WAREHOUSE

DISTINGUISHING CHARACTERISTICS

ARCHITECTURAL FRAMEWORK

TECHNICAL ARCHITECTURE

ARCHITECTURAL TYPES

Handout:

N/A

Week:

4

LECTURE 4:

INFRASTRUCTURE AS THE FOUNDATION FOR DATA WAREHOUSING

Lecture Synopsis:

INFRASTRUCTURE SUPPORTING ARCHITECTURE

HARDWARE AND OPERATING SYSTEMS

DATABASE SOFTWARE

COLLECTION OF TOOLS

DATA WAREHOUSE APPLIANCES

METADATA

Handout:

N/A

Week:

5

LECTURE 5:

DIMENSIONAL MODELING

Lecture Synopsis:

REQUIREMENTS TO DATA DESIGN

THE STAR SCHEMA

STAR SCHEMA KEYS

ADVANTAGES OF THE STAR SCHEMA

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Handout:

UPDATES TO THE DIMENSION TABLES
MISCELLANEOUS DIMENSIONS
THE SNOWFLAKE SCHEMA
AGGREGATE FACT TABLES
FAMILIES OF STARS
N/A

Week:

LECTURE 6:

6

DATA EXTRACTION, TRANSFORMATION, AND LOADING

Lecture Synopsis:

ETL OVERVIEW
ETL REQUIREMENTS AND STEPS
DATA EXTRACTION
DATA TRANSFORMATION
DATA LOADING
ETL Tool Options
ETL Summary and Approach
OTHER INTEGRATION APPROACHES

Handout:

N/A

Week:

7

MID TERM EXAM

Week:

8

MID TERM BREAK

Week:

9

LECTURE 9:

OLAP IN THE DATA WAREHOUSE

Lecture Synopsis:

DEMAND FOR ONLINE ANALYTICAL PROCESSING
MAJOR FEATURES AND FUNCTIONS
OLAP MODELS
OLAP IMPLEMENTATION CONSIDERATIONS

Handout:

N/A

Week:

10

LECTURE 10:

DATA WAREHOUSING AND THE WEB

Lecture Synopsis:

WEB-ENABLED DATA WAREHOUSE
WEB-BASED INFORMATION DELIVERY
OLAP AND THE WEB
OLAP Engine Design
BUILDING A WEB-ENABLED DATA WAREHOUSE

Handout:

N/A

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Week:	11
LECTURE 11:	Data Cube Technology
<i>Lecture Synopsis:</i>	Data Cube Computation: Preliminary Concepts Data Cube Computation Methods Processing Advanced Kinds of Queries by Exploring Cube Technology Multidimensional Data Analysis in Cube Space
<i>Handout:</i>	N/A
Week:	12
LECTURE 12:	Mining Frequent Patterns, Associations, and Correlations:
<i>Lecture Synopsis:</i>	Basic Concepts Frequent Itemset Mining Methods Which Patterns Are Interesting ?—Pattern Evaluation Methods
<i>Handout:</i>	N/A
Week:	13
LECTURE 13:	Classification
<i>Lecture Synopsis:</i>	Basic Concepts Decision Tree Induction Bayes Classification Methods Rule-Based Classification Model Evaluation and Selection Techniques to Improve Classification Accuracy
<i>Handout:</i>	N/A
Week:	14
LECTURE 14:	Cluster Analysis: Basic Concepts and Methods
<i>Lecture Synopsis:</i>	Cluster Analysis Partitioning Methods Hierarchical Methods Density-Based Methods Grid-Based Methods Evaluation of Clustering
<i>Handout:</i>	N/A
Week:	15
LECTURE 15:	REVISION
Week:	16
FINAL EXAMINATION WEEK	
Week:	17
FINAL EXAMINATION WEEK	

11.0 REFERENCES

- 1.Paulraj Ponniah, **Data Warehousing Fundamentals**, 2nd Edition John Wiley & Sons, Inc. 2010
- 2.Jiawei Han and Micheline Kamber, **Data Mining: Concepts and Techniques**, 3rd Ed., Morgan Kaufmann, 2012. ISBN 1-55860-901-6

12.0 ASSESSMENT SCHEDULE

Assignment description	issue date	due date	%
CLASS TEST	WEEK 5	WEEK5	10%
QUIZZES AND LABS	N/A	N/A	15%
GROUP ASSIGNMENT	WEEK 3	WEEK16	15%
MID TERM EXAMINATION	Week 7	Week 7	25%
FINAL EXAMINATION	Week 16 & 17	Week 16& 17	35%
TOTAL			100%

*19/8/19
100%*

13.0 ASSESSMENT CRITERIA

You will be graded based on your effort in submitting successfully well worked out assignments and performance in the examinations.

14.0 SPECIFIC CRITERIA

- Each assignment will be handed out with the project brief and will vary, depending on the teaching and learning objectives of the specific assignment.
- Each student will receive a completed assessment sheet back with their marks, thereby giving student feedback on each set criterion and the project as a whole.