Syllabus

Professor: **Daniel Lee**
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Course Catalog Description: This class will introduce the student to concepts needed for successfully designing, building and implementing a data warehouse. The class will provide the technological and managerial knowledge base for data modeling approaches such as the star schema and database de-normalization issues. Topics such as loading the warehouse, performance considerations, and other concepts unique to the data warehouse environment will be discussed and demonstrated in detail. This course will include a laboratory component.

Prerequisites: Clear understanding of Databases and Relational Database Technologiesd, basic SQL, storage, and computing.

Credit: 3-0-3 *(lecture courses)*

Course Outcome: Upon completion of the course, the student will be able to:

- Correctly use data warehousing and business intelligence terminology
- Explain and apply the Business Dimensional Lifecycle
- Perform multidimensional analysis
- Describe data warehouse infrastructure issues
- Determine the need for and management of meta data
- Explain the components of a data warehouse technical architecture
- Understanding of the top down (William Inmon) and bottom-up (Ralph Kimball) approaches for building data warehouses
- Attain basic understanding and techniques for ETL into a data warehouse
- Explain the techniques used for data presentation by analytical applications
- Demonstrate the techniques for building a dimensional data mart/warehouse
- Attain basic understanding and skills for SQL optimization and tuning

Lecture Days, Time & Place: Wednesday, 6:25 – 9:05pm, *TBD* Building room TBD, TBD Street on IIT's Mies Campus, or online via IIT Online.

Schedule of Topics/Readings: ***You should do all readings prior to class.***

Session	Date	Topic	Reading
1	January 13	Week 1 Introduction to Data Warehousing	Chapter 1
2	January 20	Week 2 Dimensional Modeling: Fundamental Concepts	Chapter 2
3	January 27	Week 3 Dimensional Modeling: Basic Fact Table Techniques	Reading 1
4	February 3	Week 4 Dimensional Modeling: Basic Dim. Table Techniques	Reading 2
5	February 10	Week 5 Dimensional Modeling: Integration via Conformed Dimensions	Reading 3
6	February 17	Week 6 Dimensional Modeling: Dealing with Slowly Changing Dimension Attributes	Reading 4
7	February 24	Week 7 Dimensional Modeling: Dealing with Dimension Hierarchies	Reading 5
8	March 2	Week 8 Dimensional Modeling: Advanced Fact Table Techniques	Reading 6
9	March 9	Week 9 Dimensional Modeling: Advanced Dimension Techniques *April 9: The First Assignment is due*	Reading 7
10	March 16	**NO CLASS: Spring Break**	

11	March 23	Week 11 Future of DW/BI (The DW Stack in Hadoop)	Reading 8
12	March 30	Week 12 SQL Optimization for DW: SQL Under The Hood	None
13	April 6	Week 13 SQL Optimization for DW: Partial vs. Full Range Scan	None
14	April 13	Week 14 SQL Optimization for DW: Index	None
15	April 20	Week 15 SQL Optimization for DW: Join	None
16	April 27	Week 16 SQL Optimization for DW: Advanced Topics *April 27: The Second Assignment is due*	None
Finals	Week of May 2	Final Examination	

***Textbook*:**

The following textbook for this course is **mandatory.**

- Kimball, R. (2013). The Data Warehouse Lifecycle Toolkit. ISBN 0-471-25547-5. John Wiley & Sons Inc.

The following textbooks for this course are **optional**:

- Inmon, W.H. (2001). Corporate Information Factory. ISBN 0-471-39961-2. John Wiley & Sons Inc.
- Meade, K. (2014). Oracle SQL Performance Tuning and Optimization: It's all about the Cardinalities. ISBN 1-501-02269-5. CreateSpace Independent Publishing Platform.

Readings/Videos: Readings for the class will be assigned from the textbook as well as in the form of online reading. Online resources and videos will be linked from or embedded in a Blackboard page. It is essential that you do all readings and/or view the videos before coming to class on the assigned date. These materials are a necessary and integral part of the class and will form the basis for any class discussions on the topic. Specific readings are assigned by topic and are available in Blackboard.

Course Notes: Copies of the course lecture notes in the form of a PDF of the PowerPoint presentation accompanying each lecture will be provided for each student on Blackboard. This should be useful if you must miss a class. You should be aware that note taking is encouraged and should help your understanding of the material.

Course Web Site: http://blackboard.iit.edu/

Blackboard: The course will make intensive use of Blackboard (http://blackboard.iit.edu/) for communications, assignment submissions, group project coordination, providing online resources and administering examinations. All remote students will view the course lectures online via Blackboard, and online readings will be found on Blackboard.

Guest Lectures: Guest lecturers may be featured as part of course topics. When a guest speaker is expected you should make an extra effort to be seated and ready prior to class time. Guest lectures may be in the evening in which case class will not be held during a scheduled morning period. A question & answer/ discussion period will be held at the end of each lecturer's presentation.

Attendance: If you are in a live section of the class and will not be able to attend class, please notify me via email or prior to class time. Live section students who miss a class should always watch the lecture online.

Assignments: There will be class exercises assigned throughout the semester that may require hands on data mart development via ETL and reporting tools. It is strongly recommended that you bring your laptop to class for hands on. These exercises will prepare you to take on the two assignments (The details of the assignments will be provided in the subsequent classes).

Examinations: Midterm and Finals grades will be assigned according to grading criteria below.

Academic Honesty:

Plagiarism: All work you submit in this course **must be your own**. You must fully attribute **all** material directly quoted in papers and you must document all sources used in the preparation of the paper using complete, APA-style bibliographic entries. Including directly quoted material in an assignment without attribution is always plagiarism and will always be treated as such by me. No more than thirty-three percent of material included in any paper may be direct quotes. Students have submitted plagiarized material the last six times I have taught this course and **I will not tolerate it**. If you submit plagiarized material you **WILL** receive a grade of **ZERO** for the assignment, an Academic Honesty Violation Report will be filed, and it may result in your expulsion from the course with a failing grade as per the IIT and ITM academic honesty policies. **There is no excuse for not understanding this policy** and if you do not understand it please let me know and I will be happy to

discuss it with you until you do. *(Should include assignment or lab collaboration statement as necessary.)*

Grading:

Grading criteria for ITMD 526 students will be as follows:

- ***A*** *Outstanding work reflecting substantial effort* 90-100%
- ***B*** *Adequate work fully meeting that expected of a graduate student* 80-89.99%
- ***C*** *Weak but marginally satisfactory work not fully meeting expectations* 65-79.99%
- ***E*** *Unsatisfactory work* 0-64.99%

The final grade for the class will be calculated as follows:

Assignment 1	**25%**
Assignment 2	**25%**
Final Exam	**25%**
Class Exercises & Participation	**25%**

Other Class Resources: Online readings and other class resources may be found at on Blackboard.

Our Contract: This syllabus is my contract with you as to what I will deliver and what I expect from you. If I change the syllabus, I will issue a revised version of the syllabus; the latest version will always be available on Blackboard. Revisions to readings and assignments will be communicated via Blackboard.

Disabilities: Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources and make an appointment to speak with me as soon as possible. My office hours are listed on the first page of the syllabus. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone 312.567.5744 or disabilities@iit.edu.