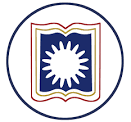
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**University of Rajshahi**

**Department of Computer Science and Engineering**

**Course Outline**

**Course Title:** Database Management Systems

**Course Code:** CSE 3121

**Course Type**: Theory

**Credits**: 3

**Prerequisite Knowledge:** CSE2131 Discrete Mathematics

**Year and Semester:** 3rd Year, Odd semester, 2021

**Class Room:** 219

**Instructor’s details:**

**Name:** Dr. Shamim Ahmad

**Designation**: Professor

**Web**: www.ru.ac.bd/cse

**Office Room**: 219 (First Floor, North Block)

**Tutorial Hous**:

Theory: Monday (10:20 am), Tuesday (10.25 am) Thursday (11.25 am)

Lab: Monday (11.25 am)

**Contact Email**: [shamim\_cst@yahoo.com](mailto:shamim_cst@yahoo.com)

**Power Point Slide’s Web Link**: [http://rurfid.ru.ac.bd/ru\_profile/public/teacher/22701143/profilee](http://103.79.117.242/ru_profile/public/teacher/22701143/profile)

**Virtual Learning Platform (if necessary):**

Zoom (PMI 427 888 6753)

Google Classroom (ID os6glmr)

Youtube channel:

Theory: <https://www.youtube.com/watch?v=buImrjobz-g&list=PLBOqIevWCE2SLoSUFjZbl6ieG4hldprMu>

Lab: <https://www.youtube.com/watch?v=Nw3F1ZvI_Yw&list=PLBOqIevWCE2RR9OZYPXap1pH0o3x7vsRz>

**Motivation of Course:**

To know basic of database design and implementation, database security, integrity and concurrency.

**Course Objective:**

The main objective of this course is to provides a solid technical overview of database management systems, using a current database product as a case study. In addition to technical concerns, more general issues are emphasized. These include data independence, integrity, security, recovery, performance, database design principles, and database administration

**Course Outcomes (COs), Program Outcomes (POs) and Assessment:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CO No. | CO Statement | Corresponding PO | Domain / level of learning taxonomy | Delivery methods and activities | Assessment tools |
| CO1 | To **understand** the primary concepts of database management systems. | **Engineering knowledge:** (PO1) | Cognitive domain – level 2 | Lecture Note  Text Book  Audio/Video  Web Material  Journal paper | Class Test  Final Exam  Assignment  Participation  Presentation |
| CO2 | To **construct** E-R diagram for real-world application scenarios, convert into relational tables, normalize it, populate and formulate SQL queries on the data. | **Engineering knowledge**  (PO1) | Cognitive domain – level 5 | Lecture Note  Text Book  Audio/Video  Web Material  Journal paper | Class Test  Final Exam  Assignment  Participation  Presentation |
| CO3 | To **criticize** a database design and improve the design by normalization. | **Problem analysis**:  (PO2) | Cognitive domain – level 5 | Lecture Note  Text Book  Audio/Video  Web Material  Journal paper | Class Test  Final Exam  Assignment  Participation  Presentation |

|  |
| --- |
| **Examination, Assessment and Marks Distribution:**  Students will be assessed on the basis of their overall performance in all the exams, class tests, assignments, and class participation. Final numeric reward will be the compilation of:  Class tests + Assignments due in different times of the semester (20%)  A comprehensive final exam (70%), **Total Time: 3 hours.**  A class participation mark (10%).  **Date for Final Examination:** The date for final examination will be announced by the Faculty of Engineering, please **keep seeing notice board, and google classroom**.  **Date for Class Test and Presentation:** Willbe announced in the google classroom.  **Lab Course Contents/List of Experiments:**  1. Installation of MySQL  2. Create database and table, Table operation (Alter/Drop etc)  3. Create table with integrated constraints (Primary key, Foreign Key)  4. Insert/delete/update SQL Query (with condition)  5. Join, Select Query with multiple conditions and from multiple Tables/Relations  6. String searching and operation  7. Trigger  8. Authorization granting  9. Concurrent processing |

**Text Book:**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | A. Silberschatz | : | **Database System Concepts**, *McGraw-Hill.* |
| 2. | James Martin | : | **Principles of Database Management**, *Prentice-hall Of India Pvt Ltd* |
| 3. | Guy Harrison | : | **Next Generation Databases, NoSQL, NewSQL, and Big Data,** *Apress* |

**Books Recommended:**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | Ullman | : | **Database Management systems**, *Prentice-Hall Publication.* |
| 2. | Abey | : | **Oracle 8i a Beginners Guide**, *McGraw Hill.* |

**Course Conducting/Course Policies:**

1. It is the student’s responsibility to gather information about the assignments and covered topics if he/she does miss the lecture
2. Regular class attendance is mandatory. Points will be taken off for missing classes.
3. Without 60% of attendance, sitting for final exam is **NOT allowed**.
4. The students must enter the **classroom in time** to get the attendance. **No student** will be allowed to enter the classroom after the attendance has been done.
5. Once the attendance is done, a student **can leave** the class if he or she thinks that he or she is not getting benefits from the class
6. The date and syllabus of quiz/class test will be announced in time in google classroom.
7. The reading materials for each class will be available at the **above given lick** prior to that class so that student may have a cursory look into the materials.
8. Students will be **notified** in due time for class cancelation, extra class, make-up class and tutorial class.
9. Students are encouraged to participate in the class discussion and to **ask questions**. The student can ask any question without any hesitation as long as he or she can’t understand the topics being discussed; please keep in mind that if you don’t understand, it’s not your fault, it’s my limitation that I could not make you understand. The class is expected to be **interactive**
10. Each student will have to present an oral presentation **for 5 minutes** on Database related recent developments, topics or technologies,
11. It is expected that the student will also provide some new knowledge related to the curriculum and then make the class as a **place of knowledge sharing among all participants, both teacher and students**.
12. Any attempt for **unfairmeans** in the examination is **strictly prohibited**.

**Class & Exam Schedule, Topics and Readings:**

|  |  |  |
| --- | --- | --- |
| **Sessions** | **Topics** | **Readings** |
| Week-1 | Database system concept | * A. Silberschatz, Database System Concepts   pp 1-23   * PowerPoint slides |
| Week-2 | Entity-Relationship Model | * A. Silberschatz, Database System Concepts   pp 27-68   * PowerPoint slides |
| Week-3 | Entity-Relationship Model | * A. Silberschatz, Database System Concepts   pp 27-68   * PowerPoint slides |
| Week-4 | Relational Model, Relational algebra | * A. Silberschatz, Database System Concepts   pp 80-118   * PowerPoint slides |
| Week-5 | Relational Model, Relational algebra | * A. Silberschatz, Database System Concepts   pp 80-118   * PowerPoint slides |
| Week-6 | Relational Databases, Basic Structure of SQL | * A. Silberschatz, Database System Concepts   pp 136-171   * PowerPoint slides |
| Week-7 | Integrity and Security | * A. Silberschatz, Database System Concepts   pp 226-246 |
| Week-8 | Relational-Database Design, Functional dependencies and normal forms | * A. Silberschatz, Database System Concepts   pp 256\*-293   * PowerPoint slides |
| Week-9 | Relational-Database Design, Functional dependencies and normal forms | * A. Silberschatz, Database System Concepts   pp 256\*-293   * PowerPoint slides |
| Week-10 | Storage and File Structure, RAID | * A. Silberschatz, Database System Concepts   pp 394-410   * PowerPoint slides |
| Week-11 | Transactions, ACID Properties, Schedul | * A. Silberschatz, Database System Concepts   pp 566-583   * PowerPoint slides |
| Week-12 | Concurrency Control, Recovery System | * A. Silberschatz, Database System Concepts   pp 591-598, 640-651   * PowerPoint slides |
| Week-13 | Next Generation Databases, NoSQL | * Guy Harrison, Next Generation Databases   pp 39-51   * PowerPoint slides |
| Week-14 | Final Exam |  |

**Project Presentation & Report Submission**

* A **project** should be presented on a topic related MySQL as a part of experimental works. Group students, consist of three or four students, will prepare this project.
* A **project report** must be submitted according to the following format:

1. Project Title, Student(s) name and ID with department name & RU logo
2. Introduction
3. Background, Motivation and Objectives
4. Design requirements
5. ER diagram, DFD
6. Key selection, Table formation
7. Introducing Constraint and Integrity
8. Normalization
9. Ensuring concurrent operations
10. implementation by MySQL
11. References