Course Description

The course explores the use of data mining techniques in different settings, including business and scientific domains. The emphasis will be on using techniques instead of developing new techniques or algorithms. Students will select, prepare, visualize, analyze, and present data that leads to the discovery of novel and actionable information.

Course Outcomes

1. To introduce the basic terminology associated with database design and management.
2. To describe the relational database model.
3. To discuss the general process and principles of database design.
4. To present methodology for database design.
5. To discuss the differences between the first, second, and third normal forms.
6. To study MySQL syntax and commands to perform CRUD operations and database administration.
7. To explore various modern database models including distributed, object-oriented, and NoSQL.
8. To introduce data mining techniques.

Principles of Undergraduate Learning

This course is designed to demonstrate one or more of the University’s principles of undergraduate learning (PULs), with emphasis on “integration and application of knowledge” (PUL 3) and “critical thinking” (PUL 2).

IUPUI Mission and Values / Student Conduct

This course will follow guidelines set out in IUPUI’s mission and values statements, available online at http://www.iupui.edu/about/vision.html. All students should be aware of and govern behavior according to IUPUI’s student code of conduct at http://www.iupui.edu/code.

Required Textbooks

1. The “Concepts” book
Video Tutorials and Training from Lynda.com


Equipment Needed

- A reliable laptop computer running Windows, Mac OS, or Linux operating system. Please visit http://informatics.iupui.edu/technology/laptop for information on the Laptop Initiative for Informatics majors.
- Some kind of storage medium to back up any files you produce for the class. Remember to back up your files frequently. If you lose the only copy of your files, you will still be responsible for assignments.

Software Needed


Homework Assignments

1. Reading and video tutorials: They will be assigned frequently. Although they will not be graded, they are critical to a student’s success and to reaching the course objectives. Completing these assignments is required.

2. Written exercises: Examples of written exercises include end-of-unit review questions, database normalization, and database design exercises, etc. These exercises will test your knowledge and understanding of the important concepts and principles discussed in class lectures.

3. Lab exercises: These are hands-on exercises related to the Premiere Products, and Henry Books case projects. These exercises will test your understanding of MySQL
commands and your ability to use MySQL Workbench program to conduct common
database management and administration activities.

4. **Final project**: This team project will demonstrate your ability to translate users’
database requirements into a design and an implementation and to perform routine
database management tasks. The project consists of three components: the design of
the database, the implementation with MySQL, and the presentation. Detailed
instructions will be available later in the semester. This final project substitutes for the
written final exam.

**Quizzes**

There will be several quizzes throughout the semester. All quizzes are closed-book. They will usually be
held on Tuesdays. Each quiz will cover the materials studied in the previous week. There will be NO
makeup quizzes. The lowest quiz score will be dropped.

**Exams**

There will be three exams throughout the semester. The first exam will cover the concepts and theory of
database normalization and the second exam will cover database design methodology. These two exams
will be closed book. The third exam will cover MySQL query practice and will be open book. Each exam
can be taken ONE time only. There will be NO makeup exams. With adequate reasons, an early
examination can be scheduled. There will be no written final exam.

**Tentative Weekly Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Exercise</th>
<th>Quiz/Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Introduction to I421</td>
<td>Ex. 1</td>
<td>Syllabus quiz</td>
</tr>
<tr>
<td></td>
<td>• Introduction to DB Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>• Relational Databases and Algebra</td>
<td>Ex. 2</td>
<td>Quiz 1</td>
</tr>
<tr>
<td>3</td>
<td>• DB Design 1: Normalization</td>
<td>Ex. 3</td>
<td>Quiz 2</td>
</tr>
<tr>
<td>4</td>
<td>• DB Design 1: Normalization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>• DB Design 1: Normalization</td>
<td>Ex. 4</td>
<td>Quiz 3</td>
</tr>
<tr>
<td>6</td>
<td>• None</td>
<td></td>
<td>Exam 1</td>
</tr>
<tr>
<td>7</td>
<td>• DB Design 2: Design Methodology</td>
<td>Ex. 5</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>• DB Design 2: Design Methodology</td>
<td>Ex. 6</td>
<td>Quiz 4</td>
</tr>
<tr>
<td>9</td>
<td>• None</td>
<td></td>
<td>Exam 2</td>
</tr>
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</table>
Grading

Grading scheme:

<table>
<thead>
<tr>
<th>Activity</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class participation</td>
<td>10</td>
</tr>
<tr>
<td>(Attendance, attitude, investment in course)</td>
<td></td>
</tr>
<tr>
<td>Exercises</td>
<td>20</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20</td>
</tr>
<tr>
<td>Exams</td>
<td>30</td>
</tr>
<tr>
<td>Final project</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Minimum percentage for each letter grade:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Minimum %</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>97</td>
</tr>
<tr>
<td>A</td>
<td>93</td>
</tr>
<tr>
<td>A-</td>
<td>90</td>
</tr>
<tr>
<td>B+</td>
<td>87</td>
</tr>
<tr>
<td>B</td>
<td>83</td>
</tr>
<tr>
<td>B-</td>
<td>80</td>
</tr>
<tr>
<td>C+</td>
<td>77</td>
</tr>
</tbody>
</table>
Course grades are calculated according to the evaluation scheme given above. In rare cases, course grades may be curved to determine the final letter grades. Whether or not course grades are curved is solely an instructor’s determination.

**Policies / Expectations / Guidelines**

**Attendance Policy**

A basic requirement of this course is that you will participate in all class meetings and conscientiously complete all required course activities and assignments. Attendance is required in this course. Attendance will be taken at the beginning of each class period. It is your responsibility to sign your name on the attendance sheet. This attendance sheet is the only valid document showing who attended what class sessions. The instructor is not expected to remember the attendance.

Each student is allowed to miss two class periods in the semester. Each absence beyond these is considered unexcused unless it falls under one of the excused absences listed below. Each unexcused absence will result in a reduction of 2 points (out of 100 points) of the course score. Six or more unexcused absences will results in an F of the course grade. In all absences, the student is responsible for all covered materials and assignments.

Only the following is considered an excused absence with appropriate documentation submitted to the instructor:

- Death in the immediate family (e.g. mother, father, spouse, child, or sibling);
- Hospitalization;
- Jury duty;
- Court ordered summons;
- Religious holiday;
- University/school coordinated athletic or scholastic activities.

**Administrative Withdrawal Policy**

All undergraduate courses fall under the Administrative Withdrawal Policy. According to this policy, if one misses more than four classes in the first four weeks, the student may be withdrawn. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period. If one is administratively withdrawn from the course, the student will not be eligible for a tuition refund. If there are any questions about the administrative withdrawal policy at any point during the semester, please contact the instructor.

**Tardy Policy**
Regular tardiness disrupts the class and affects the learning of other students. All students are expected to be on time each class. Punctuality is a measure of responsibility. An accumulation of regular tardiness could reduce your overall course grade. The tardy policy is structured as follows:

- Tardy (5 – 15) minutes = 1 tardy
- Tardy > 15 minutes = 1 absence
- 3 Tardies = 1 absence

Assignment Policy

This course may be difficult, and may involve concepts and terms you've never encountered. Budget time accordingly for all assignments. In order to ensure fairness to all students, no extra work, extra credit, or anything outside the regular homework and quizzes will be assigned. No incomplete grades will be given under any circumstances.

Written and lab exercises will be typically due Tuesdays at 10:00PM. Exact due date and time will be included in the assignment instructions. Students are responsible for the deadline. The following rules will apply to any assignment and the final project:

a. To receive full credits for an assignment, the assignment must be turned in by its deadline.
b. A late assignment will be accepted if it is not more than one hour later than the deadline. A 40% penalty will be applied.
c. Any work turned in more than one hour late will NOT be accepted.
d. Partially completed work will also be accepted for partial credit.
e. The lowest exercise score will be dropped.

Collaborative Learning

One of the best ways to learn new materials is to collaborate in groups. You are encouraged to discuss class materials and exercises with your classmates to help each other. However, the homework you hand in must be your own work, in your own words, and your own explanation.

Honor Code

You may discuss your homework and projects with classmates. You are encouraged to do so. However, all submitted work must be your own. Presenting other people’s work as your own constitutes fraud. Plagiarism undermines the academic integrity of Indiana University. Plagiarism will not be tolerated. Any one detected as having been plagiarized will be disciplined according to the IUPUI Student Code of Conduct. Multiple incidences of plagiarism may result in an F of the course grade.

Course Communications

Communication for this course will be administered via OnCourse. All announcements, homework, grades, emails, etc. will take place in that medium. Please refrain from relying on direct email for course-related questions to the instructor if avoidable.

Use of Electronic Devices
Cell phones, PDAs, pagers, instant message devices, games, and other handheld devices should be turned off during class. Laptop use may be permitted for taking notes or other purposes related to teaching and learning. Students should check with the instructor about permissible devices in class.

**Right to Revise**

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes and nature of change(s) on Oncourse Announcements.