

INFO I308

Information Representation

Department of Human-Centered Computing
Indiana University School of Informatics and Computing, Indianapolis
Spring 2017

Credit Hours: 3

Time: Mondays through Fridays

Location: **Hybrid:** Web-based, with Four in-Class Meetings

First Class: Friday, Jan 13, 2017; Rm INIT-077

Website: <https://iu.instructure.com/courses/1615799>

Instructor: Mark Abraham

Office Hours: Online or by Appointment

Office: TBD

Phone: TBD

Email: marabrah@iupui.edu

Website: <https://iu.instructure.com/about/1615799>

Prerequisites: None (Not an extension of any undergraduate or graduate course)

COURSE DESCRIPTION

The course will cover the basic structure of information representation in digital information systems, presented in two modules: relational database design and XML technologies. Through this course, students are able to represent relational databases in the ER model, query the data using the formal query language SQL, and use XML technologies to store and display data.

The contents include:

- Relational databases with MySQL, ER Model, Extended ER Model, and SQL.
- Metadata representations with XML, XML Schema, XSLT, XPath, and XQuery.

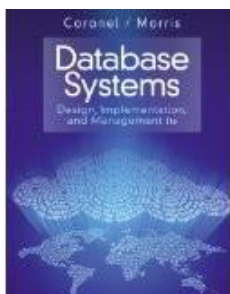
Required Textbook:

Title: Database systems: Design, implementation, management

Author(s): Carlos Coronel and Steven Morris

Edition: 11th or 12th Editions

Publisher: Cengage Learning



Available at the campus student bookstore

Principles of Undergraduate Learning (PUL):

Learning outcomes are assessed in the following areas:

- 1A. Core communication: written, oral and visual skills
- 1B. Core communication: quantitative skills
- 1C. Core communication: information resources skills
- 2. Critical thinking
- 3. Integration and application of knowledge
- 4. Intellectual depth, breadth, and adaptiveness
- 5. Understanding society and culture
- 6. Values and ethics

Major emphasis
 Minor emphasis
 Minor emphasis
 Major emphasis

Learning Outcomes:

Upon completion of this course, the student will	PUL	Assessment
1. Understand the concepts of relational databases	1B	Ex1, Ex2, Ex3, Ex4, Ex5
2. Apply the ER model or Extended ER model to real-world problems	1B, 3	Ex2, Ex3, Ex4, Ex5
3. Write SQL commands to manipulate or retrieve data in the relational database	1B	Ex7, Ex8, Ex9
4. Experience using MySQL	1B, 1C	Ex7, Ex8, Ex9
5. Analyze real-world business rules	1B, 3	Ex2, Ex4, Ex5, Ex6, Ex10
6. Design functional and efficient relational databases	1B, 3	Ex6, Ex10, Final project
7. Evaluate a database design	1B, 2, 3	Ex6
8. Convert a dataset into XML format	1B	Ex11
9. Apply data schemas to XML data	1B	Ex12, Ex13
10. Apply different styles to XML data	1B	Ex14
11. Write XPath or XQuery statements to retrieve XML data	1B	Ex15
12. Create a XML database	1B, 3	Final project

Software Used

- MS Visio 2013: free available at IU remote desktop (<https://iuware.iu.edu/Windows/Title/2095> (Links to an external site.))
- Oxygen XML Editor 17: free available at IUware (<https://iuware.iu.edu/Windows/Title/1732>) (Links to an external site.)
- MySQL workbench v6.2.x: free download [available online here](#) (Links to an external site.).

CLASS PLAN

- The course is completely online (except for 4 face-to-face meetings). It consists of 15 instructional weeks, with one “unit” each week.
- The four face-to-face meetings will be in room INIT-077. Attendance of these meetings is required. Please see the weekly schedule for the dates of the online meetings. Mr. Abraham will send out the announcement for the technology details two days before each meeting. The meetings will be 3:00 – 4:00 PM on these Fridays in Room INIT-077:
 - 01/13/2017, 02/24/2017, 03/24/2017, 4/21/2017
- We use Canvas to put all the class materials (syllabus, slides, exercises & answers, and projects).
- Each week begins on Monday and ends on Sunday midnight.
- We have a graded exercise for each week.
- The exercise solution for each week is due by Sunday midnight. The TA will grade your exercise and post the sample answer for each exercise the next Wednesday.
- Late submission policy is in the next section on this syllabus.

EXPECTATIONS, GUIDELINES AND POLICIES

Deliverables

You are responsible for completing each deliverable (e.g., exercise, project) by its deadline, and submitting it by the specified method. Deadlines are outlined in the syllabus or in supplementary documents accessible through Canvas. In fairness to the instructor and students who completed their work on time, a grade on a deliverable shall be reduced 10%, if it is submitted late and a further 10% for each 24-hour period it is submitted after the deadline.

Class assignment

- Exercises: 15 exercises

Grading information

- Exercises: 90 points
 - Each exercise has 6 points value.
- Online meeting participation: 10 points
 - Each meeting has 1 point value.
 - The in-person meetings count as 1 point each also.
 - We will have about 18 meetings together; so extra points are possible.

The total score is 100 points. At the end of the semester, everybody's score is mapped to one of the letter grades according to the standing of the class.

Grading Scale:

Grade	Minimum %	Description
A+	97.0	Professional level work, showing highest level of achievement
A	93.0	Extraordinarily high achievement, quality of work; shows command of the subject matter
A-	90.0	Excellent and thorough knowledge of the subject matter
B+	87.0	Above average understanding of material and quality of work
B	83.0	Mastery and fulfillment of all course requirements; good, acceptable work
B-	80.0	Satisfactory quality of work
C+	77.0	Modestly acceptable performance and quality of work
C	73.0	Minimally acceptable performance and quality of work
C-	70.0	Unacceptable work (Core course must be repeated for credit)
D+	67.0	Unacceptable work (Course must be repeated for credit)
D	63.0	Unacceptable work
D-	60.0	Unacceptable work
F	0.0	Unacceptable work

No credits toward major, minor, or certificate requirements are granted for a grade below C. No credits toward general education or elective requirements are granted for a grade below C-.

ONLINE ATTENDANCE AND HOMEWORK POLICY ADDENDUM

All Exercises due Sunday at midnight prior to next lesson.

As a general rule, late assignments are not accepted unless extenuating circumstances apply (i.e. hospitalization or death of a family member). If you are going to be out-of-town, turn in the assignment *early*.

Missing the in-person, online or recorded sessions is the fastest way to earn a low grade. If you cannot attend the in-person or online session, you will need to watch the recording to make up those points. You will be asked for the pass-phrase to validate that you watched the recording.

WEEKLY SCHEDULE

Date	Lecture	Exercise
Lesson 1: Week of January 9, 2017 Ex 1. Due Sunday Jan 15th.	Overview/Introduction to Database Systems Required reading: <ul style="list-style-type: none">• Chapter 1	Introduction and Ex 1
Class meeting 1 (Friday 01/13/2017 3:00 - 4:00PM), Room INIT-077		
Lesson 2: Jan 16, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	Data Models Required reading: <ul style="list-style-type: none">• Chapter 2• Microsoft Visio Tutorial for ER Model	Ex 2
Lesson 3: Jan 23, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	Relational Database Model Required reading: <ul style="list-style-type: none">• Chapter 3	Ex 3
Lesson 4: Jan 30, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	ER Modeling Required reading: <ul style="list-style-type: none">• Chapter 4	Ex 4

Date	Lecture	Exercise
Lesson 5: Feb 6, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	Extended ER Model Required reading: <ul style="list-style-type: none"> • Chapter 5 	Ex 5
Lesson 6: Feb 13, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	Normalization of database tables Required reading: <ul style="list-style-type: none"> • Chapter 6 	Ex 6
Lesson 6b: Feb 20, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	Pre-SQL, MySQL Database Prep/SQL 1 Required reading: <ul style="list-style-type: none"> • Chapter 7.1 through 7.4 	Ex 7
Class meeting 2 (Friday 2/24/2017 3:00 - 4:00PM), Room INIT-077		
Lesson 7: Feb 27, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	SQL 1 Required reading: <ul style="list-style-type: none"> • Chapter 7.1 through 7.4 	Ex 7
Lesson 8: Mar 6, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	SQL 2 Required reading: <ul style="list-style-type: none"> • Chapter 7.5 - 7.7 	Ex 8

Date	Lecture	Exercise
Lesson 9: Mar 13, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	SQL 3 Required reading:(short reading for break) <ul style="list-style-type: none"> • Chapter 8.1 through 8.4 	Ex 9
Spring Break Mar 13 – March 19th		
Lesson 10: Mar 20, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	Database Design Required reading: <ul style="list-style-type: none"> • Chapter 9 	Ex 10
Class meeting 3 (Friday 03/24/2017 3:00 - 4:00PM), Room INIT-077		
Lesson 11: Mar 27, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	XML Intro Required reading: <ul style="list-style-type: none"> • Slides for this week • Oxygen Tutorial Part I • W3C Tutorial: http://www.w3schools.com/xml/default.asp 	Ex 11
Lesson 12: Apr 3, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	DTD Required reading: <ul style="list-style-type: none"> • Slides for this week • Oxygen Tutorial Part II • W3C Tutorial: http://www.w3schools.com/xml/xml_dtd.asp 	Ex 12

Date	Lecture	Exercise
Lesson 13: Apr 10, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	XML Schema Required reading: <ul style="list-style-type: none"> • Slides for this week • Oxygen Tutorial Part III • W3C Tutorial: http://www.w3schools.com/schema/default.asp 	Ex 13
Lesson14: Apr 17, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308	XSLT Required reading: <ul style="list-style-type: none"> • Slides for this week • Oxygen Tutorial Part IV • W3C Tutorial: http://www.w3schools.com/xsl/default.asp 	Ex 14
Class meeting 4 (Friday 04/21/2017 3:00 - 4:00PM), Room INIT-077		
Lesson15: Apr 24, Monday Online @ 9PM-10PM – https://connect.iu.edu/I308 Ex. 15 Due Sun May 1, 2017	XQuery and XPath Required reading: <ul style="list-style-type: none"> • Slides for this week • Oxygen Tutorial Part V • W3CTutorial: http://www.w3schools.com/xpath/default.asp • W3CTutorial: http://www.w3schools.com/xquery/default.asp 	Ex 15

CODE OF CONDUCT

All students should aspire to the highest standards of academic integrity. Using another student's work on an assignment, cheating on a test, not quoting or citing references correctly, or any other form of dishonesty or plagiarism shall result in a grade of zero on the item and possibly an F in the course. Incidences of academic misconduct shall be referred to the Department Chair and repeated violations shall result in dismissal from the program.

All students are responsible for reading, understanding, and applying the *Code of Student Rights, Responsibilities and Conduct* and in particular the section on academic misconduct. Refer to *The Code > Responsibilities > Academic Misconduct* at <http://www.indiana.edu/~code/>. All students must also successfully complete the Indiana University Department of Education "How to Recognize Plagiarism" Tutorial and Test. <https://www.indiana.edu/~istd> You must document the difference between your writing and that of others. Use quotation marks in addition to a citation, page number, and reference whenever writing someone else's words (e.g., following the *Publication Manual of the American Psychological Association*). To detect plagiarism instructors apply a range of methods, including Turnitin.com. <http://www.ulib.iupui.edu/libinfo/turnitin>

Academic Misconduct:

1. **Cheating:** Cheating is considered to be an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or environment.
 - a. A student must not use external assistance on any "in-class" or "take-home" examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.
 - b. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare work, without advanced authorization from the instructor to whom the work is being submitted.
 - c. A student must not use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.
 - d. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student's individual work.
 - e. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.
 - f. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.
 - g. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom the work is being submitted.

- h. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.
- 2. **Fabrication:** A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.
- 3. **Plagiarism:** Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered "common knowledge" may differ from course to course.
 - a. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
 - b. A student must give credit to the originality of others and acknowledge indebtedness whenever:
 - 1. directly quoting another person's actual words, whether oral or written;
 - 2. using another person's ideas, opinions, or theories;
 - 3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
 - 4. borrowing facts, statistics, or illustrative material; or
 - 5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment

4. **Interference:** A student must not steal, change, destroy, or impede another student's work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any student's grade or the evaluation of academic performance. Impeding another student's work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.
5. **Violation of Course Rules:** A student must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the course materials that are rationally related to the content of the course or to the enhancement of the learning process in the course.
6. **Facilitating Academic Dishonesty:** A student must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

OTHER POLICIES

1. **Right to revise:** The instructor reserves the right to make changes to this syllabus as necessary and, in such an event, will notify students of the changes immediately.
2. **IUPUI course policies:** A number of campus policies governing IUPUI courses may be found at the following link: http://registrar.iupui.edu/course_policies.html
3. **Classroom civility:** To maintain an effective and inclusive learning environment, it is important to be an attentive and respectful participant in lectures, discussions, group work, and other classroom exercises. Thus, unnecessary disruptions should be avoided, such as ringing cell phones engagement in private conversations and other unrelated activities. Cell phones, media players, or any noisy devices should be turned off during a class. Texting, surfing the Internet, and posting to Facebook or Twitter during class are generally not permitted. Laptop use may be permitted if it is used for taking notes or conducting class activities. Students should check with the instructor about permissible devices in class. IUPUI nurtures and promotes "a campus climate that seeks, values, and cultivates diversity in all of its forms and that provides conditions necessary for all campus community members to feel welcomed, supported, included, and valued" (IUPUI Strategic Initiative 9). IUPUI prohibits "discrimination against anyone for reasons of race, color, religion, national origin, sex, sexual orientation, marital status, age, disability, or [veteran] status" (Office of Equal Opportunity). Profanity or derogatory comments about the instructor, fellow students, invited speakers or other classroom visitors, or any members of the campus community shall not be tolerated. A violation of this rule shall result in a warning and, if the offense continues, possible disciplinary action.
4. **Bringing children to class:** To ensure an effective learning environment, children are not permitted to attend class with their parents, guardians, or childcare providers.
5. **Course Evaluation Policy:** Course evaluations provide vital information for improving the quality of courses and programs. Students are required to complete one course and instructor evaluation for each section in which they are enrolled at the

School of Informatics and Computing. This requirement has three exceptions: (a) The student has withdrawn from the course; (b) only one student is enrolled in the section (in which case anonymity is impossible); and (c) the section is a laboratory that must be taken with a course having a different section number. Course evaluations are completed at <https://soic.iupui.edu/app/course-eval/>. Course evaluations are open from the eleventh week. Course evaluations are anonymous, which means that no one can view the name of the student completing the evaluation. In addition, no one can view the evaluation itself until after the instructor has submitted the final grades for the course. In small sections, demographic information should be left blank, if it could be used to identify the student. A course evaluation must close before the grade for that course can be released. To ensure students have had ample opportunity to complete the evaluation, an uncompleted course evaluation could delay the release of the grade for up to a week.

6. **Communication:** The instructor should respond to emails within 48 hours, excluding weekends and holidays, and announce periods of extended absence in advance. The instructor should provide weekly office hours or accept appointments for face-to-face, telephone, or teleconferenced meetings.
7. **Email:** Indiana University uses your IU email account as an official means of communication, and students should check it daily for pertinent information. Although you may have your IU email forwarded to an outside email account, please email faculty and staff from your IU email account.
8. **Disabilities Policy:** In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. Please notify the instructor during the first week of class of accommodations needed for the course. Students requiring accommodations because of a disability must register with Adaptive Educational Services (AES) and complete the appropriate AES-issued before receiving accommodations. The AES office is located at UC 100, Taylor Hall (Email: aes@iupui.edu, Tel. 317 274-3241). Visit <http://aes.iupui.edu> for more information.
9. **Administrative Withdrawal:** A basic requirement of this course is that students participate in all class discussions and conscientiously complete all required course activities and/or assignments. If a student is unable to attend, participate in, or complete an assignment on time, it is the student's responsibility to inform the instructor. If a student misses more than half of the required activities within the first 25% of the course without contacting the instructor, the student may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period, and a student who has been administratively withdrawn from a course is ineligible for a tuition refund. Contact the instructor with questions concerning administrative withdrawal.
10. **Emergency Preparedness:** Safety on campus is everyone's responsibility. Know what to do in an emergency so that you can protect yourself and others. For specific

information, visit the emergency management website. <http://protect.iu.edu/emergency>

Withdrawing from This Class Using eDrop (Spring 2017)

If you choose to withdraw from this class, here are important dates and information:

- Jan 16 – March 12 Withdrawal with automatic grade of “W.” Requires instructor and advisor approval.
- March 13 – May 1 Withdrawal with a grade of “W” or “F” begins on March 13 and extends through the end of the semester on May 1. Requires advisor, instructor, and dean’s approvals. **Beginning on this date (March 13), drops will be approved only if you have serious, extenuating circumstances. You must provide documentation (or evidence) of the serious, extenuating circumstance to the Associate Dean for Academic Affairs and Undergraduate Programs in ET 215. However, if you are being advised by an advisor in the New Student Academic Advising Center in ET 101, you must see your advisor to initiate an eDrop. You must provide documentation (or evidence) of the serious, extenuating circumstances to your advisor who will forward it to the Associate Dean.**

NOTE: After you submit the electronic eDrop request, others must approve it. ***You are not withdrawn until you receive confirmation your eDrop has been approved and processed.*** You should attend class while you wait for the approvals and remind your instructor to approve your electronic eDrop. If all approvals are not completed in 14 days, the Office of the Registrar cancels your eDrop request; if this happens, you are still officially enrolled in the class.

See http://registrar.iupui.edu/eDoc/eDrop_student.html for additional information.

MISSION STATEMENT

The Mission of IUPUI is to provide for its constituents excellence in

- Teaching and Learning;
- Research, Scholarship, and Creative Activity; and
- Civic Engagement.

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community;
- A commitment to ensuring diversity; and
- Pursuit of best practices.

IUPUI’s mission is derived from and aligned with the principal components—Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices—of Indiana University’s Strategic Directions Charter.

STATEMENT OF VALUES

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its

location in Indiana's capital city and is committed to serving the needs of its community. Thus, IUPUI students, faculty, and staff are involved in the community, both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and professional development of its students, faculty, and staff and to continuous improvement of its programs and services.