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Syllabus

# IS 456: Database Management Systems

# School of Technology & Computing

5 Credits, Undergraduate Course

Fall 2021

Delivery Mode: Online

*Access to the Internet is required.*

*All written assignments must be in Microsoft-Word-compatible formats.*

*See the library’s APA Style Guide tutorial for a list of resources that can help you use APA style.*

# **Faculty Information**

Professional experience information for instructors is found under *Faculty Information* in the online course menu.

# **Contact Information**

Contact information for instructors is found under *Faculty Information* in the online course menu.

**Name: F**arzin Bahadori

**Email:** bahadorifarzin@cityu.edu  
**Phone or Skype:**(818) 462-1409  
**Office Hours and Response Time:**I am available through Blackboard Collaborate Ultra on Friday between 5 p.m.- 6 p.m. I will respond within 24 hours. I will grade within 3 business days after the due date.

  
**Bio:**   Welcome to IS-456 Database Management Systems! My name is Farzin Bahadori and I would like to welcome you to the course. I am delighted to be your instructor in this course. A little about me is that I have earned a bachelor of Science in Atomic and Molecular Physics, A Master of Science in Plasma Physics, A Master of Science in Information management Systems, and currently I am working on my dissertation for my Ph.D. in Applied Computer Science from North Central University in Arizona. I have worked as a Department of Defense Certified Aviation Instructor, Programming and Troubleshooting the Flight Control Management Systems in DoD Aviation Units, and as an Assistant Professor in Computer Science Department at Saint Martin’s University. I have experience in teaching variety of software applications, such as C#, Python, SQL, C++, database management Systems, Project Management and Software Engineer. I have gained a wealth of knowledge and life experience and I am excited to share it with you in this course. If I could impart any wisdom from my life experience as an instructor and learner, it would be this quote from Nelson Mandela “Education is the most powerful weapon which you can use to change the world.” I encourage all of my students to work hard through this course and remain persistent and dedicated to graduating.

I am looking forward to a rewarding session with you, helping you to consider different concepts, from beginners to advance in Database Technologies including topics in Internet and telecommunication, E-commerce and web technologies, Database management Systems, Database Design and database coding, Privacy and security. Please read the attached Syllabus that contains all the instructions which will help you to success in this course and some help.

Course Description

This course provides the students with an introduction to the core concepts in data and information management. It is centered around the core skills of identifying organizational information requirements, modeling them using conceptual data modeling techniques, converting the conceptual data models into logical/physical data models and verifying its structural characteristics, and implementing and utilizing a relational or non-relational database using an industrial-strength database management system. The course will also cover basic database administration tasks and critical concepts of data quality and data security. In addition to developing database applications, the course helps the students understand how large-scale packaged systems are highly dependent on the use of DBMSs. This course introduces data and information management technologies that provide decision support capabilities under the broad business intelligence umbrella.

# **Course Resources**

Required and recommended resources to complete coursework and assignments are found on the course [Reading List](https://cityu.alma.exlibrisgroup.com/leganto/login?auth=SAML). Note: resources listed under "Required - Must Purchase" should be purchased from a vendor of the student’s own choosing; resources listed under "Available from the Library" are available at no cost to students.

**Textbook**

All three textbooks available online: <https://library.cityu.edu/>

* Mukesh Negi, (2019). *Fundamental of Database Management System.*
* Manning, A. (2015). [*Databases for small business: essentials of database management, data analysis, and staff training for entrepreneurs and professionals*](https://login.proxy.cityu.edu/sso/skillport?context=104365). Apress.
* Avi Silberschatz, Henry F. Korth,S. Sudarshan (7th Ed.) *Database System Concepts, McGraw-Hill, ISBN 9780078022159*

# **Course Outcomes**

At the end of this course, learners will be able to:

* Understand the role of an enterprise database management system in an organization.
* Understand security issues related to DBMS
* Understand the concept of a database transaction and related database facilities, including concurrency control, journaling, backup and recovery, and data object locking and protocols.
* Apply basic database concepts, including the structure an operation of the relational and non-relational data model.
* Apply logical database design principles, including E-R diagrams and database normalization to design and implement database management systems, EER modeling, data warehousing, client/server & internet database environments
* Analyze and discuss selected advanced database topics, such as distributed database systems and the data warehouse.
* Asses conceptual data modeling techniques into logical/physical data models
* Create a security plan for the data base project

Core Concepts, Knowledge, and Skills

Topics include:

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* Enterprise Data Base Management Systems
* Writing SQL statements in MySQL, or PostgreSQL.
* Complex Data Types
* Application Development
* Big Data
* Data Analytics
* Physical Storage Systems
* Data Storage Structures
* Database-System Architectures
* Parallel and Distributed Storage
* Parallel and Distributed Query Processing
* Parallel and Distributed Transaction Processing
* Parallel and Distributed Transaction Processing
* EER modeling
* Data warehousing and business intelligence,
* Client/server & internet database environments
* Blockchain Databases

# **Grading Scale**

The grades earned for the course will be calculated using City University of Seattle’s decimal grading system, found in the current University Catalog (<https://www.cityu.edu/catalog/>).

Grading rubrics with details on how each assignment will be graded are located under *Assignments* and/or in *My Grades* in the online course menu. Students should review the rubric for each assignment prior to completing their work in order to understand how it will be assessed.

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| --- | --- | --- |
| **OVERVIEW OF REQUIRED ASSIGNMENTS** | **% OF FINAL GRADE** | **POINTS** |
| The Muddiest Point (MP) | 5% | 50 = 5 points\* 10 modules |
| Concept Test (CT) | 5% | 50 = 5 points\* 10 modules |
| Discussion Board (DB) | 10% | 100 = 10 points\* 10 modules |
| Hands-On Practice (HOP) | 20% | 200= 20 points\* 10 modules |
| Programming Assignment | 30% | 300= 30 points \* 10 modules |
| Knowledge Check (KC) | 10% | 100= 10 points \* 10 modules |
| Team Project (TP) | 20% | Proposal: 30 points  Progress: 70 points  Final Report: 70 points  Final PPT: 30 points  Subtotal: 200 points |
| **TOTAL** | **100%** | **1,000 points** |

The following approaches are used for developing this course content:

Assessment

* Summative Assessment**.**<https://en.wikipedia.org/wiki/Summative_assessment>
* Formative Assessment. <https://en.wikipedia.org/wiki/Formative_assessment>

Classroom Assessment Techniques

* The Muddiest Point. <https://en.wikipedia.org/wiki/Classroom_Assessment_Techniques>

Active Learning. <https://en.wikipedia.org/wiki/Active_learning>

* Flipped Classroom. <https://en.wikipedia.org/wiki/Flipped_classroom>
* Just-in-time Teaching (JiTT). <https://en.wikipedia.org/wiki/Just-in-time_teaching>
* Peer Instruction. <https://en.wikipedia.org/wiki/Peer_instruction>)

Learning Theory

* Learning-by-doing. <https://en.wikipedia.org/wiki/Learning-by-doing>
* Project-Based Learning (PBL). <https://en.wikipedia.org/wiki/Project-based_learning>
* Social Learning. <https://en.wikipedia.org/wiki/Social_learning_(social_pedagogy)>

Evidence-Based Practice (EBP). <https://en.wikipedia.org/wiki/Evidence-based_practice>

* Pair Programming. <https://en.wikipedia.org/wiki/Pair_programming>
* Stand-up Meeting. <https://en.wikipedia.org/wiki/Stand-up_meeting>
* Agile Software Development. <https://en.wikipedia.org/wiki/Agile_software_development>

# **Course Assignments and Grading**

The instructor will provide grading rubrics with add how assignments will be graded.

**The Muddiest Point (MP)**

Before class, students are required to finish the muddiest point activity. This activity is designed to stimulate student engagement in class. Also, the instructor uses feedbacks from the Muddiest Point in preparation for the classroom lecture to implement Just-in-Time Teaching (JiTT). This activity consists of writing a brief reflective essay (<= 50 words) in which students identify the most confusing part (i.e., the muddiest point) of the content covered in the upcoming module. If you do not have an MP, you can explain the most exciting aspect.  Also, students will answer one multiple choice question from the required reading to determine students’ grasp of core concepts.

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| --- | --- |
| ***Components*** | ***% of Grade*** |
| Quality Participation: Meets requirements on time. | 60% |
| Writing: Is clear, concise, and grammatically correct. | 20% |
| Accuracy: Answers quizzes correctly. | 20% |
| **TOTAL** | **100%** |

**Concept Test (CT)**

In class, students may be required to answer questions called Concept Tests, which allows peers to teach others, i.e., Peer Instruction. 1) The instructor poses a problem based on students' responses to their pre-class reading. 2) Students reflect on the question. 3) Students commit to a definite answer. 4) Instructor reviews student responses without giving the correct answer to the students. 5) Students discuss their thinking and solutions with their peers. 6) Students then commit again to a specific answer. 7) The instructor back reviews responses and decides whether more explanation is needed before moving on to the next concept. Any participating students will earn their 100% grade.

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| --- | --- |
| ***Components*** | ***% of Grade*** |
| Quality Participation: Meets requirements on time. | 100% |
| **TOTAL** | **100%** |

**Discussion Board (DB)**

All classes are required to use the Discussion Board. Participation through DB is an integral part of this course. It is defined as active engagement in a discussion or other activity. Instructors will determine the type of activities and their due dates; moreover, different DB activities will have different substance and length guidelines. The instructor will provide specific instructions to students.

A discussion question or topic from the instructor appears weekly in the Discussion Board. Students post their answers and responses to two other students' ones in the DB by the end of each module. The DB is to help promote student to student engagement. The instructor may not respond to each posting. 

Questions or comments specifically for the instructor should be emailed directly to the instructor or posted in the Question and Answer Forum. Students who want to talk with other students about issues unrelated to the discussion forums should use the Coffee Talk Forum.

Although the tone of your DB postings can be informal, your instructor will expect the content to be on a professional level. Your comments and questions for discussion should be clear and thoughtful, with correct grammar, spelling, and punctuation. As with written assignments, the quality of your discussion postings will be graded on both content and presentation.

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| --- | --- |
| ***Components*** | ***% of Grade*** |
| Quality Participation: Meets requirements on time. | 80% |
| Writing: Is clear, concise, and grammatically correct. | 20% |
| **TOTAL** | **100%** |

**Hands-on Practice (HOP)**

The instructor may assign hands-on practice exercises to a pair of students in class or individually online. Students will learn and practice either specific tools or languages pertinent to their course. Each activity will be graded by pass or fail to encourage collaboration among students. (Pair programming can be used for the generation of more diverse solutions to problems.)

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| ***Components*** | ***% of Grade*** |
| Quality Participation: Meets requirements on time. | 80% |
| Accuracy: Answers questions correctly. | 20% |
| **TOTAL** | **100%** |

**Programming Assignment**

Students are expected to complete cloud-based labs that support the concepts taught within this course. This section delivers an online-based environment using cutting edge technology and provides a fully immersive mock system administration infrastructure enabling students to test their skills with realistic scenarios.

The Programming Assignment involve the viewing of instructional documents and following step-by-step instructions. Activities are embedded within each lab. These activities present a challenge to complete. Each lab will be graded on accuracy and writing. The student has unlimited attempts at each lab to increase their accuracy and earn skills. Students are required to write their understandings and findings in their lab reports.

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| ***Components*** | ***% of Grade*** |
| Accuracy: Answers questions correctly | 80% |
| Writing:  Is clear, concise, and grammatically correct. | 20% |
| **TOTAL** | **100%** |

**Knowledge Check (KC)**

Students will complete weekly quizzes from the course content to reflect on what they have learned in the course. Completing all KCs will help ensure that you successfully master the concepts in this course. The best way for you to gain a thorough understanding of the underlying concepts is to apply those concepts to solve the quizzes. You should focus on the underlying principles, rather than just memorizing information.

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| ***Components*** | ***% of Grade*** |
| Accuracy: Answers questions correctly. | 100% |
| **TOTAL** | **100%** |

**Team Project (TP)**

Each student can select his or her team that consists of three students.  A group of fewer than three students requires the instructor’s approval. Each team will use an instructor-approved topic relevant to the course.

The paper must be no less than 6-7 pages. We required you to use the paper template from [EDSIG/CONISAR](http://www.aitp-edsig.org/), the international conference standard. *The instructor may recommend* *the best papers in this course to conferences with your team’s approval. If necessary, the instructor may require more revisions after the course is over. However, the paper submission is optional and has nothing to do with your course grade*.

We will provide you three report templates and one presentation template. The file name consists of team project number, team number, and the list of your team members. For example, “*TP01 T03 Sam John Mark*.”

* TP01 for the proposal - “*TP01 T0X Author1 Author2 Author3.docx*”
* TP02 for the progress report - “*TP02 T0X Author1 Author2 Author3.docx*”
* TP03 for the final report - “*TP03 T0X Author1 Author2 Author3.docx*”
* TP04 for the final presentation slide - “*TP04 T0X Author1 Author2 Author3.pptx*”

As in any scholarly writing, students should not merely copy information from another author. Students should use evidence to support the contentions they have drawn from their findings and critically analyze related literature. In essence, each paper needs to be an analytical paper, not a summary of readings.

In addition, a team presentation slide is required.

* The presentation consists of 15+4 slides: 15 slides for content and 4 slides for cover, agenda, key reference, and Q&A.
* The PPT template is provided. Your team can change design and color for your team’s purpose.
* If necessary, a presentation video (15 minutes) may be requested.
* If necessary, a demo video (a maximum of 1-2 minutes) may be requested. But, the demo time should be included in the total presentation time (15 minutes).

The following two resources are useful to improve your report:

* Plagiarism Checker - [Plagiarism Detector](https://plagiarismdetector.net/)(free) at <https://plagiarismdetector.net/>
* Grammar Checker - [Grammarly.com](https://app.grammarly.com/) (partially free) at <https://app.grammarly.com/>

The following two resources are useful to improve your presentation slides:

* St. George International School of English. (2013, Nov 14). [Steve Jobs Presentation Skills](https://www.youtube.com/watch?v=iJq-thyDF9Q) (7:34). Retrieved from <https://www.youtube.com/watch?v=iJq-thyDF9Q>
* Gyaantastic. (2017, Feb 5). [7 Presentation Skills to learn from Steve Jobs](https://medium.com/@gyaantastic/7-presentation-skills-to-learn-from-steve-jobs-8fbfdebc4fc4). Retrieved from <https://medium.com/@gyaantastic/7-presentation-skills-to-learn-from-steve-jobs-8fbfdebc4fc4>

**Four** submissions are required according to the following schedule:

* Proposal (1 page; 30 points) - Starting (Module 1) & Ending (Module 3)
* Progress Report (3-4 pages; 70 points; graded after the proposal has been submitted) - Starting (Module 4) & Ending (Module 7)
* Final Report (6-7 pages; 70 points; graded after the progress has been submitted) - Starting (Module 8) & Ending (Module 10)
* Final PPT (15+4slides, 30 points; graded after the final report has been submitted) - Starting (Module 8) & Ending (Module 10)

Students are expected to use the assigned readings, videos, and other materials throughout the quarter. Students will need to utilize additional sources that were not assigned by the professor. While stylized after an industry report, nonetheless, students are expected to employ APA formatting of citations, footnotes, and bibliography. Students must cite the sources of all ideas, facts, and information used that are not their own, even if they have put the information into their own words. Failure to do so is plagiarism, although the oversight is unintentional. To avoid plagiarism, check <https://library.cityu.edu/howto/apa-writing/avoid-plagiarism/>.

**Project Description: Database Systems management***Instructor designs Projects derived from Course Learning Outcomes.*

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| --- | --- |
| ***Components*** | ***% of Grade*** |
| Structure:  Consists of the required report elements. | 10% |
| Content: Demonstrates critical analysis & synthesis of concepts. | 30% |
| Reference: Is pertinent to the topic and cited appropriately. | 10% |
| Writing: Is clear, concise, and grammatically correct. | 10% |
| Visual Presentation: Is well designed, legible, and persuasive. | 20% |
| Team Collaboration: Is based on peer review. | 20% |
| **TOTAL** | 100% |

Course Policies

**Late Assignments**

Please email me if you believe you will be late turning in an assignment. I will work with you to ensure you succeed in class, however, late assignments I will authorize late submission in a case-by-case basis.

**Participation**

I expect all students to participate in the discussion board, and complete all assignments in a timely manner.

**Professional Writing**

Assignments require error-free writing that uses Standard English conventions and logical flow of organization to address topics clearly, completely, and concisely. CityU requires the use of APA style.

# **University Policies**

Students are responsible for understanding and adhering to all of City University of Seattle’s academic policies. The most current versions of these policies can be found in the [University Catalog](http://www.cityu.edu/catalog/) that is linked from the CityU Web site.

### **Title IX Statement**

City University of Seattle and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If students have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage them to report this to the University. If a student speaks with a faculty member about an incident of misconduct, that faculty member must notify CityU’s Title IX coordinator and share the basic fact of the experience. The Title IX coordinator will then be available to assist students in understanding all of the options and in connecting students with all possible resources on and off campus.

To view CityU’s sexual misconduct policy and for resources, please visit the [Title IX](https://my.cityu.edu/titleix/) and [Campus Safety](https://my.cityu.edu/department/campus-safety/) pages in the my.cityu.edu portal.

### Religious Accommodations

Washington state law requires that City University of Seattle develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The University’s policy, including more information about how to request an accommodation, is available in the University Catalog. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request Form found on the student dashboard in the my.cityu.edu student portal.

### Academic Integrity

Academic integrity in students requires the pursuit of scholarly activity that is free from fraud, deception and unauthorized collaboration with other individuals. Students are responsible for understanding CityU’s policy on academic integrity and adhering to its standards in meeting all course requirements. A complete copy of this policy can be found in the [University Catalog](http://www.cityu.edu/catalog/) under *Student Rights and Responsibilities* on the page titled *Academic Integrity Policy.*

### **Attendance**

Students taking courses in any format at the University are expected to be diligent in their studies and to attend class regularly.

Regular class attendance is important in achieving learning outcomes in the course and may be a valid consideration in determining the final grade. For classes where a physical presence is required, a student has attended if they are present at any time during the class session.  For online classes, a student has attended if they have posted or submitted an assignment. A complete copy of this policy can be in the [University Catalog](http://www.cityu.edu/catalog/) under *Student Rights and Responsibilities* on the page titled *Attendance.*

# **Support Services**

### **Disability Services Accommodations Statement**

Students with a documented disability who wish to request academic accommodations are encouraged to contact Disability Support Services to discuss accommodation requests and eligibility requirements. Please contact Disability Support Services at [*disability@cityu.edu*](mailto:disability@cityu.edu) or 206.239.4752 or visit the [Disability Support Services](https://my.cityu.edu/department/disability-support-services/) page in the my.cityu.edu portal. Confidentiality will be observed in all inquiries. Once approved, information about academic accommodations will be shared with course instructors.

### **Library Services**

CityU librarians are available to help students find the resources and information they need to succeed in this course. Contact a CityU librarian through the [Ask a Librarian](http://library.cityu.edu/ask-a-librarian/)service, or access [library resources and services online](http://library.cityu.edu/), 24 hours a day, seven days a week.

### **Smarthinking Tutoring**

CityU students have access to free online tutoring offered through Smarthinking, including writing support, from certified tutors 24 hours a day, seven days a week. Contact CityU’s Student Support Center at [help@cityu.ed](mailto:help@cityu.ed) to request a user name and password.

Is there data on who uses this service?

Course Schedule

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| --- | --- | --- | --- |
| Modules | Topics | readings | assignments |
| 10/5-10/11 | **Enterprise Data Base Management Systems** | Chapter 1: Fundamentals  Online Source | 1. The Muddiest Point 2. Discussion Board 3. Knowledge Check |
| 2   10/12-10/18 | **Database Architecture and Models/ Relational and Normalization**  Designing Database Management Systems and Data Types | Chapters 2 and 3  Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Knowledge Check |
| 3   10/19-10/25 | **Database queries and SQL Operators**  Database writing and modification with SQL/Writing statements in MySQL | Chapters 4, 10 & 11  Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Programming Assignment 6. Knowledge Check 7. Team Project |
| 4  10/26-11/1 | **Application Development and Database Joins** | Chapters 5 & 7  Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Programming Assignment 6. Knowledge Check 7. Team Project Announcement |
| 5  11/2-11/8 | **Analyze data Interchange** | Chapter 6  Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Programming Assignment 6. Knowledge Check 7. Team Project Announcement |
| 6   11/9-11/15 | **Physical and Data Storage Systems**    Backup & Recovery | Chapter 8  Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Programming Assignment 6. Knowledge Check 7. Team Project Announcement |
| 7   11/16-11/22 | **Parallel and Distributed Processing (Storage, Query and Transaction)** | Chapter 9  Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Programming Assignment 6. Knowledge Check 7. Team Project  Final Announcement |
| 8  11/23-11/29 | **EER Modeling / Business Intelligence** | Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Knowledge Check 6. Team Project Progress Submission |
| 9   11/30-12/6 | **Data warehousing and Mobile Relational Databases** | Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Programming Assignment 6. Team Project Presentation |
| 10   12/7-12/13 | **Client/Server & Internet database / Blockchain Databases** | Online Source | 1. The Muddiest Point 2. Concept Test 3. Discussion Board 4. Hands-On Practice 5. Programming Assignment 6. Knowledge Check |