

# SYLLABUS



Professor HG Locklear  
[hlocklear@pace.edu](mailto:hlocklear@pace.edu)

# GENERAL

## 1. COURSE DESCRIPTION

1. THIS COURSE IS A FIRST COURSE IN RELATIONAL DATABASE PROGRAMMING. CONCEPTS AND TECHNIQUES OF DATA DEFINITION (DDL) AND DATA MANIPULATION (DML) USING SQL WILL BE STRESSED. STUDENTS WILL CONCENTRATE ON PROGRAMMING SKILLS RELATED TO DDL AND DML UTILIZING THE MYSQL RDBMS.

## 2. MAJOR TOPICS COVERED INCLUDE:

- CREATING THE STRUCTURES OF A DATABASE
- POPULATING A DATABASE
- ENFORCING INTEGRITY CONSTRAINTS IN A DATABASE
- RETRIEVING, UPDATING, AND DELETING DATA FROM A DATABASE
- CREATING STORED PROGRAMS IN A DATABASE

## 2. COURSE MEETING

- TUESDAY **ON-CAMPUS** 6:10 – 9:00 PM 161 WILLIAM STREET 163WM RM 1335

## 3. COURSE TEXTBOOK

- NO TEXTBOOK IS REQUIRED...WILL BE USING THE ONLINE DOCUMENTATION FOR MYSQL COMMUNITY SERVER 8.0 LOCATED AT [HTTPS://DEV.MYSQL.COM/DOC/REFMAN/8.0/EN/](https://dev.mysql.com/doc/refman/8.0/en/)

## 4. COURSE SOFTWARE

- STUDENTS WILL NEED MYSQL COMMUNITY SERVER VERSION 8.0 LOCATED AT [HTTPS://DEV.MYSQL.COM/DOWNLOADS/MYSQL/8.0.HTML](https://dev.mysql.com/downloads/mysql/8.0.html)

# GENERAL

## 5. COURSE OVERVIEW:

- THIS COURSE IS DESIGNED TO GIVE THE STUDENT AN IN-DEPTH UNDERSTANDING OF AND EXPERIENCE WITH THE FUNDAMENTALS OF PROGRAMMING IN RELATIONAL DATABASES.
- THE COURSE WILL INSTRUCT THE STUDENT ON HOW TO USE STRUCTURED QUERY LANGUAGE (SQL) TO CREATE, UPDATE, RETRIEVE, AND DELETE DATA, IN THE MYSQL RDBMS, USING SIMPLE TO COMPLEX QUERIES.
- ADDITIONALLY, AND FOREMOST, THE STUDENT WILL CREATE BOTH SIMPLE AND SOPHISTICATED STORED PROGRAMS THAT ALLOW FOR DATABASE STRUCTURE CREATION, QUERY OPTIMIZATION, AND REPORT GENERATION.
- THIS IS A PROGRAMMING COURSE AND STRESSES THE DEVELOPMENT OF FUNDAMENTAL PROGRAMMING SKILLS THROUGH A “LEARN BY DOING” APPROACH.
- WHILE TERMINOLOGY, CONCEPTS, AND THEORY ARE VERY IMPORTANT TO THE DESIGN AND MANAGEMENT OF A RDBMS, THIS COURSE IS DESIGNED TO INSTILL AND REINFORCE THOSE PRECEPTS THROUGH THE REPEATED “ACTUAL” DESIGN AND MANIPULATION OF A RELATIONAL DATABASE PROGRAMMATICALLY.

# GENERAL

## 6. LEARNING OBJECTIVES:

- UPON COMPLETION OF THIS COURSE, THE STUDENT WILL HAVE A COMPREHENSIVE UNDERSTANDING OF THE DESIGN AND OPERATION OF A RDBMS.
- THE STUDENT WILL BE ABLE TO DEMONSTRATE THIS UNDERSTANDING BY WRITING SOPHISTICATED PROGRAMS WHICH AUTOMATICALLY PERFORM COMMON DATABASE OPERATIONS.

## 7. LEARNING OUTCOMES:

- AFTER COMPLETING THIS COURSE, THE STUDENT SHOULD BE FAMILIAR WITH THE SKILLS AND RESPONSIBILITIES NORMALLY ASSIGNED TO A RELATIONAL DATABASE DESIGNER.

# PROFESSOR HG LOCKLEAR

- I have been an Adjunct Professor teaching at Pace since 2017.
- I am a Computer Scientist, and my academic research was in the application of machine learning techniques for biometric continuous authentication.
- Prior to my academic work I was in the US Marine Corps for 27 years.
- I teach a variety of undergraduate and graduate programming subjects:
  - Java
  - Python
  - SQL
  - Machine Learning and Predictive Analytics
  - Java Desktop Application Development
  - Java (JSP) Dynamic Web Application Development
  - PHP Web Dynamic Web Application Development
- In addition to teaching, I primarily work for a Defense Contractor where I develop Cognitive AI systems for military simulations. You can see some of my projects here <https://sdi.ai/capability/enabling-technology/>
- I greatly enjoy teaching programming at Pace, and I am VERY PASSIONATE about computer science and the Database Programming.

# Course Outline

		PART I	PART II
<h2>Review of Fundamentals</h2>	Database Entities	<h2>Relational Databases</h2>	Stored Program
	MySQL Community Server		Use of Native Functions
	MySQL Script Creation		Use of User-Defined Functions
	Simple Queries		Stored Program Flow Control
			<b>Advanced Stored Programs</b>
	Relation Design and Creation		Use of Cursors
	Use of Constraints and Referential Integrity		Use of Triggers
	Normalization Procedures		Use of Events
	Use of Indexing		Use of Regular Expressions
	Use of Views		Use of JSON
<h2>Advanced Queries</h2>	Use of Subqueries, Joins and Unions	Reviewed Only (Student Prerequisite)	Discussed with Extensive Practical Exercises
	Use of Aggregate Functions		
	Construction of Summary Queries		
		Focus of Course	

# Course Calendar

Week	Class	Agenda
1	SEPT 8	
2	SEPT 15	
3	SEPT 22	
4	SEPT 29	
5	OCT 6	
6	OCT 13	
7	OCT 20	
8	OCT 27	Midterm Exam

Week	Class	Agenda
9	NOV 3	
10	NOV 10	
11	NOV 17	
12	NOV 24	
13	DEC 1	
14	DEC 8	
15	DEC 15	
16	DEC 22	Final Exam

## PART I

- Review of Fundamentals
- Relational Databases
- Advanced Queries

## PART II

- Stored Programs
- Advanced Stored Programs

# Course Grading

- Grading of the course is divided into three categories.
- There is no individual course extra credit and grading is not weighted.
- Grade information will be displayed on BrightSpace.

Grading Protocol		
Event	Grade %	Count
Homework	20%	~10 (2 pts each)
In-Class Quizzes	20%	~10 (2 pts each)
Exams	60%	2 (30 pts each)
<b>OVERALL</b>	<b>100%</b>	

All exams and assignments involve the creation of MySQL scripts that perform some database functionality. To receive any points for an exam or homework assignment, your code must follow the specified guidelines and be a coherent attempt to solve the specified problem. Incoherent code or code that does not follow the guidelines receives 0 points.

Exam Grading Protocol		
Exam	Extra Credit Points (Completion of Practice Exam)	Exam
Midterm	0 to 10	10 or 30
Final	0 to 10	10 or 30

Prior to each exam you will have a Take-Home Practice exam that is worth a maximum of 10 points. These points will be added to your exam grade if you receive less than the maximum score for the exam. The maximum score you can get on an exam is 30.

Exam scores are a combination of the practice exam score and the exam score. Exam grading is binary; you receive a 30 on the exam if your code runs correctly and a 10 otherwise...there is very limited partial credit.

# GRADING

- **Homework Assignments:**
  - Are always programming exercises.
  - Always have a deadline of 7 days after being posted.
  - Graded within 5-7 days after submission deadline.
  - You are allowed ONLY one graded submission (last submission).
  - Any submissions not in correct format (.sql file) will **not receive** any points.
  - My solution will be posted immediately after the HW deadline.
  - Receive a grade between 0-2 points in 0.5-point increments.
  - Point deductions **will** be accompanied by an explanation of why the points were deducted.
  - Bring any discrepancies to me as soon as possible.
  - The number of points deducted for an error is **not debatable**, but if something was marked wrong, that you think is correct, notify me soon as possible.

- **In-Class Quizzes:**
  - Are always a SQL script creation exercise.
  - Are always announced before class (BrightSpace Announcement).
  - Have a 20-minute time limit.

# GRADING

- **Exams:**

- Will be a programming exercises that solves either a single problem or a set of problems.
- Encompasses ALL material discussed prior to exam.
- Graded **within 3-5 days after** submission deadline.
- Grading is binary (minimum score is 15 points and maximum score is 30 points)
  - **15 points** if solution is incomplete or does not solve the specified problem in the specified manner.
  - **30 points** if solution meets all requirements.
- Grading is binary for each problem in the set, if exam has multiple problems (each problem has a minimum and a maximum point value).
- You **can receive a 0** if you submit your solution after the deadline, in the incorrect format, or the solution is not a reasonable attempt to solve the problem.
- There is some limited partial credit for solutions that are mostly correct.
- If you receive less than 30 on the exam, your practice exam extra credit is added to the score...this becomes your total score for the exam.

# Course Grading Process

Student Grade Calculation Process					
Homework Points	Quiz Points	Practice Exam Points Midterm Exam Points	Practice Exam Points Final Exam Points	Total Points	
20	20	30	30	100	
Letter Grade					
A	93-100				
A-	90-92				
B+	87-89				
B	83-86				
B-	80-82				
C+	77-79				
C	76-70				
D	60-69				
F	< 60				

# COURSE TECHNOLOGY

- We will ONLY be using MySQL community server 8.0.X for our class, ensure that you install that version not any other.
  - You can find the installer for Windows here <https://dev.mysql.com/downloads/mysql/>
    - **Choose Microsoft Windows**
  - You can find the DMG files for MAC here <https://dev.mysql.com/downloads/mysql/>
    - **Choose macOS**
- If you have other RDBMSs running on your computer, change the port number to something other than 3306 (i.e., 3307) when you install MySQL...this will allow you to run multiple different RDBMSs on your computer simultaneously.
  - If you do not need the other RDBMSs, I recommend you uninstall them.
- You will be writing SQL scripts and will need a plain text editor to do so. I recommend using Sublime 4 as that is what I will be using to demonstrate in class.
  - I **recommend against** using MySQL Workbench.
  - You can find Sublime 4 at <https://www.sublimetext.com/download>
- **Ensure that you install and verify your required software is working...we will be writing code on the very first day of class.**
- If you have problems installing your software...**KEEP TRYING**...I'm sure you can do it and I consider it one of requirement, for the course, that you install it on your own.
  - If you have some big problems, I can provide some guidance.

# Important Aspects of Our Course

- The ongoing residual effects of the Pandemic represents a series of challenges to learning effectively. We, together, will do everything we can to mitigate those challenges and ensure that we have a great learning experience.
- These are some very important items to remember:
  - The course is a programming course and can be very challenging, ensure that you practice and stay current with the lectures. Each lectures builds on the last.
  - This is a graduate-level course, as such I expect a high-degree of academic maturity and understanding that the workload for this course will be very high. Ensure you use good time management.
  - Ask questions about ANYTHING you don't understand.
  - Submit all work on time.
  - I don't have a scheduled office hours period, but I can arrange a meeting with you if you have some issue you need to discuss in person. I prefer, if possible, that we handle everything in-class or by email. I will ALWAYS be available, after each class, for discussion if needed.
- Most importantly:
  - WE ARE GOING TO HAVE A LOT OF FUN.
  - We are going to learn a lot of very practical skills in the use of RDBMS.
  - We will resolve ANY ISSUE you have in the fairest way possible.
  - Do not hesitate to contact me about ANYTHING that will interfere with your attendance or completion of the course.

# COURSE SUCCESS

- **ATTEND** AND PARTICIPATE IN CLASS.
- SUBMIT ASSIGNMENTS ON TIME.
- WORK ON YOUR HOMEWORK INCREMENTALLY, **AVOID WAITING UNTIL DIRECTLY** BEFORE THE DEADLINE.
  - **HOMEWORK IS WHERE 90% OF ALL YOUR LEARNING TAKES PLACE**...PUT A LOT OF EFFORT HERE.
  - THIS WAY YOU LEARN THE MOST FROM THE ASSIGNMENTS BY HAVING AN OPPORTUNITY TO WORK THROUGH THE PROBLEMS AND ASK QUESTIONS.
  - **BE METICULOUS ABOUT YOUR SUBMISSIONS**...CHECK AND RECHECK THAT EVERYTHING IS **EXACTLY** THE WAY IT SHOULD BE.
- DISCUSS HOMEWORK ASSIGNMENTS WITH YOUR CLASSMATES...BRAINSTORM TOGETHER BUT ULTIMATELY WRITE YOUR OWN SOLUTION.
- **PRACTICE**
- BE VERY PREPARED FOR EXAMS BY ORGANIZING YOUR NOTES AND PROGRAMMING ENVIRONMENT.

# Academic Integrity

- All students are expected to behave with honesty and integrity.
- During the course you are required to follow the **Pace Academic Integrity Standards** described in the Student Handbook <http://www.pace.edu/sites/default/files/files/student-handbook/Academic-Integrity-Code.pdf>