DEPARTMENT: Biostatistics and Bioinformatics

COURSE NUMBER: INFO 521
SECTION NUMBER: 1

COURSE TITLE: Database Development for Public Health
CLASS HOURS AND LOCATION: Tues/Thurs 2:30-3:50PM
GCR 105

CREDIT HOURS: 3
SEMESTER: Fall 2018

INSTRUCTOR NAME: Andrea Plotsky

INSTRUCTOR CONTACT INFORMATION

EMAIL: agplots@emory.edu
PHONE: 404-727-8618
SCHOOL ADDRESS OR MAILBOX LOCATION: Mailstop: 1515-001-1AA
OFFICE HOURS: Please email instructor to set up an appointment.

Teaching Assistant(s): None

COURSE DESCRIPTION

This course will cover the principles utilized in data management and database development for purposes of Public Health. This is primarily a skills-based course - the students will learn to create a relational database using Microsoft Access 2016, as well as gain an understanding of the important terminology, standards and data management principles utilized by data management teams.

MPH/MSPH FOUNDATIONAL COMPETENCIES:

1) Select quantitative and qualitative data collection methods appropriate for a given public health context

CONCENTRATION COMPETENCIES:
MSPH in Public Health Informatics
Upon completion of the MSPH degree the graduate will be able to:

•
Develop public health information systems as needed to support public health efforts | Mileposts 1A, 2A, 3A, 4
---|---
• Evaluate information systems that meet the needs of public health practice | Mileposts 1B, 3B
• Assist in the development and adoption of information technology in public health | Mileposts 1, 2, 3, 4
• Adhere to guidelines of responsible research | All assignments, including Mileposts 1, 2, 3, 4, Merging project & Redcap assignment

### COURSE LEARNING OBJECTIVES:

<table>
<thead>
<tr>
<th>GOAL 1: Database Planning</th>
<th>Assessments</th>
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<tr>
<td>• <strong>Objective 1a</strong>: The students will be able to create the following Planning Documents - a basic Requirements Document, an Entity Relationship Diagram, and a Data Dictionary according to the instructions for Milepost 1A.</td>
<td>Milepost 1A&amp;1B</td>
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<td>• <strong>Objective 1b</strong>: The students will be able to apply vocabulary standards in lookup fields in their database tables, and the proper coding of values in their Data Dictionaries and databases tables, as described in Mileposts 1A and 2A.</td>
<td>Milepost 1A&amp;1B</td>
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<th>GOAL 2: Database Objects</th>
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<td>• <strong>Objective 2a</strong>: The students will be able to develop tables in Microsoft Access, which do not violate the principles of “Data redundancy”, “Data inconsistency”, and “Data anomalies” in Microsoft Access, as well as describe the differences in “cost” of relational databases vs flat files.</td>
<td>Milepost 2A&amp;2B</td>
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<td>• <strong>Objective 2b</strong>: The students will be able to construct properly normalized tables to 3rd Normal Form and relate them, given the description of a database project or a de-normalized table example.</td>
<td>Milepost 2A&amp;2B</td>
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<td>• <strong>Objective 2c</strong>: The students will create database tables with proper field properties set for Data Types, Field Sizes, Input Masks, Validation, Validation Messaging, and Indices per the instructions in Milepost 1A &amp; Milepost 2A.</td>
<td>Milepost 2A&amp;2B</td>
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<td>• <strong>Objective 2d</strong>: The students will be able to create forms to receive data, as well as</td>
<td>Milepost 3A&amp;3B</td>
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creating reports to show the data in the
database, as described in Milepost 3A.
Furthermore, the students will be able to split
a database after developing it, such that
 tables are in the back-end and forms and
reports are in the front-end, as described in
Milepost 4.

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<tr>
<th>Objective 2e</th>
<th>Milepost 4</th>
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<td>The students will be able to program Macro objects and/or use Visual Basic for Access by including two Event-driven actions in their database projects, as described in Milepost 4.</td>
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<tr>
<th>Objective 2f</th>
<th>SAM Paths 1-12</th>
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<tr>
<td>The students will meet 95% criteria on their SAM assignments, indicating their Microsoft Access skills and understanding of database principles for each Tutorial.</td>
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<tr>
<th>Objective 2g</th>
<th>SQL Homework &amp; SQL Normalization Assignments</th>
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<tr>
<td>The students will complete a SQL tutorial and score 90% or better on associated problem sets.</td>
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<th>GOAL 3: Public Health Applications</th>
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<tr>
<th>Objective 3a</th>
<th>Milepost 1A&amp;1B</th>
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<td>The students will be able to identify the important issues to consider when dealing with various data collection &quot;models&quot; used in public health research, including registries, lab-verified/host surveillance data and multiple visit scenarios.</td>
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<tr>
<th>Objective 3b</th>
<th>Data Merging Assignment</th>
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<td>The students will use action queries and other strategies to import data from a Source data set with different data types, vocabulary issues, and field naming issues into a Target database.</td>
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<tr>
<th>Objective 3c</th>
<th>Mileposts 1B, 3B</th>
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<td>The students will be able to evaluate other databases re: the use of proper design principles.</td>
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<th>GOAL 4: Security</th>
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<tr>
<th>Objective 4a</th>
<th>Milepost 4</th>
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<td>The students will use the various security features of Microsoft Access - Database Splitter, Linked Table Manager, Database Encryption and Password Protection Tools, and Start-up Options - in order to create different versions of their Final database, as described in Milepost 4.</td>
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**Grading Scale**

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<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tr>
<td>A</td>
<td>96.5+</td>
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<tr>
<td>A-</td>
<td>92.5-96.49</td>
</tr>
<tr>
<td>B+</td>
<td>82.5-92.49</td>
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Course: XXX
B: 75.5-82.49  
B-: 67.5-75.49  
C: 50-67.49  

*Mileposts 2A, 2B, and 3A:  
25%  
*Final Project:  
50%  
*SAM PostTests and Projects,  
Milestone 1A,  
Milestone Evaluations (1B,3B),  
Non-SAM Homework,  
Video Quizzes:  
15%  

Weighting  
*Attendance & Tutorials: 
10%  

COURSE STRUCTURE:  

1) The 1st third of the course will be spent talking about the basic relational  
database concepts that are so important when building a functional database.  
We will also learn best practices of database development from start to finish.  
We will also begin to explore Access with the first few tutorials from your book.  

2) During Weeks 7-16, we will be completing a Tutorial from the book weekly.  
Usually, this is to be done on your own (Thurs-Mon). You will also have a few  
short videos to watch, which discuss the concepts introduced in the tutorials.  
Videos will have a short, 1 question assignment due before class.  

3) The last few weeks, we will cover some advanced topics – Merging Data and  
Event-based Programming. In addition, in weeks 8-9 you will be exposed to SQL  
commands. These will mainly be in-class short lectures and labs.  

4) The main graded items are SAM Training Assignments, additional homework  
assignments and your Milepost Database assignments. You will be given time in  
class to work on many of these, although you will need to work on them outside  
of class, as well.  

SAM Assignments  

1) The SAM System helps to reinforce the concepts learned in your book’s  
Tutorials. This is an online Pretest/Training/Post-test method. If you have come  
to class and completed the week’s tutorial in the book, this should not be too  
difficult.  
   a. Pre-test: You will receive immediate results of the pretest with the  
   remediation needed.  
   b. Training: Receive instruction & Practice the items you missed.  
   c. Take a post-test – this grade will count. You will be given 10 chances to  
reach 95% criteria or higher. (most students don’t need more than 1 or 2  
times to meet criteria).  

2) Occasionally, I will give you a SAM Case Project in lieu of a SAM Training. These  
are database scenarios created to give more practice reinforcing the concepts  
you’ve been learning. These can usually be completed within an hour or 2 – we’ll  
start in class, but you may need some extra time to complete your project outside  
of class.
3) *The problems at the end of each Tutorial are not required.*

**Mileposts/Final Project**

1) For the final project, you will build a database independently. This will usually be based upon your practicum project, unless your project doesn’t lend itself to a database project.

2) You will start creating this database at the beginning of the semester and it will be turned in for a grade 3 times previous to the Final Due Date. These intermediary assignments are called Mileposts.

3) Be thinking about the database needs of your Practicum Project. Gather copies of surveys, logs, etc. that might be amenable to a database.

4) The Final Project does not require a dataset. This class emphasizes the *structure of the database* that holds the data.

**COURSE POLICIES**

**Tardiness:** Class will begin at 2:30pm *sharp.* I will not wait for anyone. We have a lot of material to cover!

**Due Dates:** Due dates are to be honored. Late work will only be accepted in extreme cases.

**Missed Classes:** The student is responsible for obtaining material distributed on class days from other students when he/she is absent. Any data files, etc. will be available on Canvas. Attendance will be taken and factored into the class grade as a Participation Grade.

**Cell Phones:** Class lectures and labs are No Cell Phone Zones. Please turn your phones off before class.

**Academic Dishonesty:** Plagiarism and cheating are serious offenses and may be punished by failure, according to the RSPH Policies. For this class, it is permissible to assist classmates in general discussions of computing techniques. General advice and interaction are encouraged. Each person, however, must develop his or her own solutions to the assigned projects, assignments, and tasks. Each student is accountable for being able to understand and explain the concepts in the assignment.

*Each student must complete their SAM assignments and exams independently. You may use your book to look up items between taking the pretests/post-tests, but may not refer to your book while taking the tests.*
As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Equity and Inclusion, 404-727-9877.

**Need for Assistance:** As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Equity and Inclusion, 404-727-9877.

If you have any condition, such as a physical or learning disability, which will make it difficult for you to carry out the work as I have outlined it, or which will require academic accommodations, please notify me as soon as possible.

**ALSO,** if you find that you are “lost” with the material, please do not hesitate to contact me as soon as possible. Since learning database development is cumulative, it is essential that you understand each concept before moving on to the next. The material here isn’t rocket science, but it does require your attention and practice to grasp it. The sooner you come for help, the better. The ball will be in your court to take responsibility for this – I won’t be able to chase you down.

**Canvas:** Check the announcements section of Canvas for when new material has been posted. I will send you an e-mail to notify as well. All assignments can be seen on the Canvas calendar.

**Online Resources:** As with any computer-related topic, the more you practice what you are learning, the greater chance that you will "own" the information. The textbook publisher has provided many practice opportunities. Besides the end of chapter exercises (which I encourage you to do on your own, although they are not required), there is an online site with additional scenarios to practice with self-quizzes and games. These can be found at:www.cengagebrain.com – Student Resources

**RSPH POLICIES**

**Accessibility and Accommodations**

Accessibility Services works with students who have disabilities to provide reasonable accommodations. In order to receive consideration for reasonable accommodations, you must contact the Office of Accessibility Services (OAS). It is the responsibility of the student to register with OAS. Please note that accommodations are not retroactive and that disability accommodations are not provided until an accommodation letter has been processed.

Students who registered with OAS and have a letter outlining their academic accommodations are strongly encouraged to coordinate a meeting time with me to...
discuss a protocol to implement the accommodations as needed throughout the semester. This meeting should occur as early in the semester as possible.

Contact Accessibility Services for more information at (404) 727-9877 or accessibility@emory.edu. Additional information is available at the OAS website at http://equityandinclusion.emory.edu/access/students/index.html

Honor Code

You are bound by Emory University’s Student Honor and Conduct Code. RSPH requires that all material submitted by a student fulfilling his or her academic course of study must be the original work of the student. Violations of academic honor include any action by a student indicating dishonesty or a lack of integrity in academic ethics. Academic dishonesty refers to cheating, plagiarizing, assisting other students without authorization, lying, tampering, or stealing in performing any academic work, and will not be tolerated under any circumstances.

The RSPH Honor Code states: “Plagiarism is the act of presenting as one’s own work the expression, words, or ideas of another person whether published or unpublished (including the work of another student). A writer’s work should be regarded as his/her own property.” (http://www.sph.emory.edu/cms/current_students/enrollment_services/honor_code.html)
**COURSE CALENDAR**
This calendar (attached) is used by the instructor. It includes all lecture topics and assignments. The students use the Assignments pages and Calendar in Canvas for knowledge of class topics, assignments, and due dates.

**COURSE OUTLINE**

Week 1: - Introduction  
Week 2: What is Informatics? What's a Database? Survey Design; Reporting to Repositories  
Week 3: Requirements Gathering; ERDs, Relationships, Data Dictionaries, MILEPOST PREQUEL DUE; SAM PATH 1  
Week 4:; Naming Conventions, Creately, Referential Integrity; SAM PATH 2  
Week 5: Standard Vocabularies; MILEPOST 1 DUE  
Week 6: Dependencies ; Normalization;  
Week 7: More Normalization; SAM PATH 3  
FALL BREAK: NO CLASS – Tues, Oct 9  
Week 8: Introduction to Forms & Reports; MILEPOST 2 DUE; SAM PATH 4  
Week 9: Advanced Queries; SAM PATH 5;  
Week 10: Forms; SAM PATH 6  
Week 11: Reports; RedCap Demo; SAM PATH 7;  
Week 12: Sharing, Integrating & Analyzing Data; SAM QUICK EXAM; MILEPOST 3A/B DUE  
Week 13: Merging Data; Action Queries; (SAM PATH 9 - OPTIONAL)  
Week 14: Macros; Data Merge DUE; SAM Path 10; NO CLASS – Thurs, Nov 22 - THANKSGIVING  
Week 15: VBA Programming; SAM PATH 11;  
Week 16: Database Security; Database Presentations  
FINALS WK (12/18): *FINAL PROJECT DUE*