

# MIS 523 -- Programming Logic and Design

Summer II 2014

**Professor:** *Dr. Bob Folden*

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**Office Hours:** *Monday and Thursday 9:30 am to 12:00 pm and other times by special appointment.*

## Course Description:

An introduction to the program development and design process, including computer-based concepts of problem-solving, structured programming logic and techniques, algorithm development and program design. Topics include program flowcharting, algorithms, input/output techniques, looping, modules, selection structures, file handling, control breaks, pseudocoding, and user documentation. Offers students an opportunity to apply skills in a laboratory environment.

## Course Prerequisite(s):

No graduate prerequisites.

## Course Objectives:

1. Describe various problem solving techniques and the concept of programming language.
2. List the steps in the program development method and identify various programming elements.
3. Identify decision-making constructs and looping constructs and demonstrate their appropriate use.
4. Differentiate between subroutines and functions as well as identify the techniques for parameter passing.
5. Identify the use of arrays, pointers and binary trees.
6. Differentiate between subroutines and functions as well as identify the techniques for parameter passing.

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## **Students with Disabilities:**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services  
Texas A&M University-Commerce  
Gee Library, Room 132  
Phone (903) 886-5150 or (903) 886-5835  
Fax (903) 468-8148  
[StudentDisabilityServices@tamuc.edu](mailto:StudentDisabilityServices@tamuc.edu)

## **Conduct**

“All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment.” ([See Guidebook](#))

## **Academic Integrity**

Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students

***All work submitted to this Instructor may be submitted to an academic integrity verification service such as Turnitin.com.***

You are responsible for authenticating any assignment submitted to this instructor. If asked, you must be able to produce proof that the assignment submitted is actually your own work. Therefore, it is recommended that you engage in a verifiable working process on assignments. Keep copies of all drafts of your work, make photocopies of research materials, keep logs or journals of your work on assignments, and papers, learn to save a version of assignments under individual filenames on computers or diskettes, etc.

**The inability to authenticate your work, should it be requested, is sufficient grounds for failing an assignment.**

## **Appeals Process:**

Students taking online classes at Texas A&M University-Commerce have the same rights as students enrolled in face-to-face classes. The A&M-Commerce Student [Guidebook](#) details those rights and explains complaint and grievance procedures, as well as the Student Code of Conduct. Students have the right to appeal course grades, admissions committee decisions, or any adverse action taken by any faculty against any student. The appeal process is the same for all types of appeals.

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## Assignments

There are basically six assignments, one for each unit. While they may take some time, you should be able to complete them in the allotted time, but you should not leave them to the end. You will be graded on the quality of the work performed and not the quantity. I have an idea of what I expect for each assignment and that is what I will use to grade your work. None of the assignments require programming experience or knowledge. All the information that you need to complete the assignments will either be found in the text or can be easily looked up online. You will do your best if you read the assignment before reading your text, allowing you to seek solutions while you are reading.

## Essay Exams

There are six essay exams that must be completed during the semester. Each exam is a single question. You are to answer them in as much detail as possible. **You should support your answers from the literature not your textbook.** Your support must come from sources other than course textbooks. You must document your sources or you may receive a zero for any work submitted. You may work offline to complete the exams and then copy and paste your answers into the appropriate space. You must submit them by the due date. I would recommend that you pace yourself so that you are not doing them all at one time. Your grade will be determined on the basis of the quality of your answer and not on the basis of quantity of answer.

**These answers are to be solely your own effort. You are not to collaborate with other students or use another individual's or group's work without proper citation.**

**Essay Exam 1:** Discuss the steps in the program development method. Identify the important principles and processes that are accomplished in each step. Provide an example of each one.

**Essay Exam 2:** Discuss internal and external documentation. Include their purposes and the kind of information one would find in each.

**Essay Exam 3:** Do the methods used to process data in a program change as the quantity of data increases? Why or why not?

**Essay Exam 4:** Why have RDBMSs become a necessary staple for all enterprises and most businesses? How do they improve the performance of the business? Support your answer.

**Essay Exam 5:** With all of the advantages of OOP, why is a procedural language like COBOL still the most prominently used language in business today? Please support your answer from the literature.

**Essay Exam 6:** What kind of file processing is appropriate for game design? Why?

**Extra Credit:** What type of data might be useful to a community in the wake of a natural disaster? Who should pay for the expense of gathering, storing, and maintaining this data? Where would this data be gathered from? How would you validate the data.

## Projects

You will complete 6 ABAP projects. For the most part they will be a step by step guided exercise to help you gain an understanding in how a program is developed and tested in SAP. They will also help you to understand how we use the different programming elements to produce a business information system.

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## Discussions:

In this course, you will be expected to participate in weekly discussions. Professional communication is always expected. In order for you to achieve the maximum number of points for your Discussion grade, please answer each thread on three separate levels:

1. Answer the posted question (10 points)
2. Respond to other's posted questions (6 points)
3. Reply to any persons who have responded to you (4 points)

Discussion questions and topics may be added to the discussion area throughout the Semester. You will need to visit the area regularly. You are to consider the question or topic and post an appropriate response. You should support your response with external sources (not textbooks) whenever appropriate. I will grade your responses based upon the quality of the response. This is to be an attempt to create a seminar environment where you will be able to increase one another's knowledge of the subject. You should visit this at least once a week to read the material and respond appropriately.

## Textbook(s) and Other Materials:

### Required:

*Problem Solving and Programming Concepts*. Maureen Sprankle & Jim Hubbard, 9<sup>th</sup> edition, 2012. ISBN: 0-13-249464-4

Digital Edition: ISBN-10 0-13-249311-X or go here:

[http://www.coursesmart.com/IR/932765/9780132493116?\\_hdv=6.8](http://www.coursesmart.com/IR/932765/9780132493116?_hdv=6.8) (\$51.99)

*Discover ABAP* (2nd Edition). Kuhnhauser, Karl-Heinz & Franz, Thorsten, 2<sup>nd</sup> Edition, 2011. ISBN: 978-1-59229-402-2

Print: \$49.95

E-book \$44.99

Print & e-book \$59.99

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## Grading:

Grading Percentages	
A =	90+ percent of total points
B =	80-89 percent of total points
C =	70-79 percent of total points
D =	60-69 percent of the total points
F =	59- 0 percent of the total points

Graded Activities	
Discussions 20 @ 20 pts. Each	400
Assignments 6 @ 300 pts. Each	1800
Essay Exam 6 @ 100 pts. Each	600
Projects 6 @200 pts. Each	<b>1200</b>
<b>Total Points Possible</b>	<b>4,000</b>

Late assignments and tests may have points deducted from the final score.

**Using someone else's words as if they were your own is plagiarism. The way to avoid this is to give credit to the author. Use citations to give credit to the author; you will gain the respect of other professionals, and you will also avoid an automatic F on the paper and most likely for the course.**

**Course Outline and Assignments: This is only a proposal to guide you in efforts to stay up with the course.**

<b>Unit</b>	<b>Date</b>	<b>Reading</b>	<b>Projects or Exams</b>
<b>Problem Solving</b>	<b>July 11</b>	Chapter 1	<b>Discussion 1:</b> Name three problems that might arise at home, at school, or in a business that could be solved more efficiently with computer assistance. Do these problems require an algorithmic or heuristic solution? Why?
		Chapter 2	<b>Discussion 2:</b> What are some other naming conventions in use (besides what is in the text)? What are the key elements?
		Chapter 3	<b>Discussion 3:</b> How does the Software Development Cycle help one to develop better programs? Why?  <b>Assignment 1:</b> Complete the Algorithm and Flowchart Form (cf. Figure 3.12, pg. 54) for the process of cooking your favorite food dish. <b>ABAP Project 1</b> <b>Essay Exam 1:</b> Discuss the steps in the program development method. Identify the important principles and processes that are accomplished in each step. Provide an example of each one.
<b>Logic Structures</b>	<b>July 15</b>	Chapter 4	<b>Discussion 4:</b> Illustrate each of the programming logic structures from you non-programming life experiences.
		Chapter 5	<b>Discussion 5:</b> Which of the Solution Development Tools/Problem Analysis Tools do you find to be most helpful? Why?
		Chapter 6	<b>Discussion 6:</b> Describe a real world example of when you used a Case logic structure to solve a problem. Why was this approach needed?
		Chapter 7	<b>Discussion 7:</b> When is each of the looping forms most appropriate to use? Why do you think so?  <b>Assignment 2:</b> The Last Stop Boutique is having a five-day sale. Each day, starting on Monday, the price will drop 10% of the previous day's price. For example, if the original price of a product is \$20.00, the sale price on Monday would be \$18.00 (10% less than the original price). On Tuesday the sale price would be \$16.0 (10% less than Monday). On Wednesday the sale price would be \$14.58; on Thursday the sale price would be \$13.12; and on Friday the sale price would be \$11.81. Develop a solution that will calculate the price of an item for each of the five days, give the original price. Test the solution for an item costing \$10.00. Complete the seven steps of solution development and a data dictionary in preparing your solution.  <b>ABAP Project 2</b>  <b>Essay Exam 2:</b> Discuss internal and external documentation. Include their purposes and the kind of information one would find in each.

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<b>Data Structures</b>	<b>July 21</b>	Chapter 8	<b>Discussion 8:</b> Provide an example from your experience of the use of each of the array types (one dimensional, two dimensional, & multi-dimensional). Why was each of them used?
		Chapter 9	<b>Discussion 9:</b> Discuss the use of Stacks and Cues in a program. Why would one use one instead of the other? Which one is best?
		Chapter 10	<b>Discussion 10:</b> How does having a systems flowchart help one to develop better business solutions? Why?
		Chapter 11	<b>Discussion 11:</b> Are indexing and linked lists the same thing? Why or why not?
		Chapter 12	<p><b>Discussion 12:</b> Discuss the advantages and disadvantages of hierarchical data structures.</p> <p><b>Assignment 3:</b> Complete the seven steps of solution development and a data dictionary in preparing your solution. (This will have two sets of documents.)</p> <p><b>Scenario:</b> Your Company is creating a program which will be used to quiz clients on various products. As a part of prototype delivery to your client, you've been asked to create the program logic for one of the quizzes. The particular quiz contains questions on 5 different soft drink products.</p> <p><b>Quiz Requirements:</b></p> <ul style="list-style-type: none"> <li>• Each question has the possibility of 4 answers.</li> <li>• Verify if the respondent provides a valid response. If not then prompt them for it.</li> <li>• When a valid response is provided, determine if it is the correct answer.</li> <li>• If it is correct, display "correct", otherwise, display "The correct answer is" and the correct answer.</li> <li>• After the user answers all questions, display the number of correct and incorrect answers.</li> </ul> <p>This should be constructed as a series of nested decisions.</p> <p><b>Inputs from Programming Lead:</b> Remove the nested decisions by using an array. Create a parallel array with the correct answer for each question.</p> <p><b>ABAP Project 3</b></p> <p><b>Essay Exam 3:</b> Do the methods used to process data in a program change as the quantity of data increases? Why or why not?</p>

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<b>Database Management Systems</b>	<b>July 28</b>	Chapter 13	<b>Discussion 13:</b> Why is a database management system essential for a business? Provide support from the literature.
		Chapter 14	<p><b>Discussion 14:</b> Why is it essential that a database is normalized? What is the most appropriate way to ensure that it is?</p> <p><b>Assignment 4:</b> The New Plays Repertory Theater would like to computerize its ticket sales. The theater seats 500 people, offers seven plays each year, and sells season tickets and single-night tickets. The season tickets are all for performances at the same time during the week. Each play has 20 performances. The theater keeps a customer list of those people who buy tickets in order to send play information for advertising purposes.</p> <p>The reports they would like to create are:</p> <ol style="list-style-type: none"> <li>1. A listing of available seats</li> <li>2. A listing of all plays and the actors in the plays</li> <li>3. A listing of customers</li> <li>4. Labels printed for all customers</li> <li>5. A listing of season ticket holders</li> </ol> <p>Plan an RDBMS for this problem.</p> <p><b>ABAP Project 4</b></p> <p><b>Essay Exam 4:</b> Why have RDBMSs become a necessary staple for all enterprises and most businesses? How do they improve the performance of the business? Support your answer.</p>
		Chapter 15	<b>Discussion 15:</b> Why has Object Oriented Programming (OOP) almost completely replaced procedural programming? Explain with support.

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<b>Object Oriented Programming</b>	<b>August 4</b>	Chapter 16	<p><b>Discussion 16:</b> Which UML tool is the easiest for you to use? Why?</p> <p><b>Assignment 5:</b> A restaurant wants a scheduling system for its employees. The software needs to allow the restaurant owner to schedule employees for up to 40 hours in a seven-day week. The restaurant is open from 6:00 AM to 10:00 PM. The system should include a check-in and checkout system for the employees, a printout of employees' work hours, and the ability to change hours if necessary.</p> <ol style="list-style-type: none"> <li>1. Design a solution to the problem using the five steps to design an object-oriented solution.</li> <li>2. Create the storyboards for the application with the storyboard interactivity diagram. Be creative!</li> <li>3. Describe some Use Cases for the application. Create one Use Case Diagram for the application.</li> </ol> <p><b>ABAP Project 5</b></p> <p><b>Essay Exam 5:</b> With all of the advantages of OOP, why is a procedural language like COBOL still the most prominently used language in business today? Please support your answer from the literature.</p>
		Chapter 17	<p><b>Discussion 17:</b> Some state that game programming is no different than any other type of programming. Do you agree or not? Support your answer from the literature.</p>
		Chapter 18	<p><b>Discussion 18:</b> Why should the average programmer understand Assembly Language Concepts?</p>
		Chapter 19	<p><b>Discussion 19:</b> When would you need to develop a sequential-access file application? Why?</p>
<b>Advanced Concepts and File Processing</b>	<b>August 11</b>		

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		Chapter 20	<p><b>Discussion 20:</b> Why is updating a sequential-access file so difficult? Provide support from the literature.</p> <p><b>Assignment 6:</b> Develop a complete solution, including a data dictionary, for the following problem: The financial director of a private school would like a tracking system for the students at the school.</p> <ol style="list-style-type: none"> <li>1. Design the file. The information on the student includes: name, home address and telephone, age, sex, class status, parent's name (one parent), dormitory room, tuition, room fees, board fees, book fees, computer fees, miscellaneous fees, date of payment on each charge.</li> <li>2. Design the reports needed: <ol style="list-style-type: none"> <li>a. Student directory</li> <li>b. Charges</li> <li>c. Outstanding fees</li> <li>d. List of students by dormitory</li> <li>e. List of students by class</li> </ol> </li> <li>3. Develop a solution using sequential-access files to output the needed reports.</li> <li>4. Develop an update program.</li> </ol> <p><b>ABAP Project 6</b></p> <p><b>Essay Exam 6:</b> What kind of file processing is appropriate for game design? Why?</p> <p><b>Extra Credit Due</b> <b>Drop Dead Date</b></p>
	<b>August 14</b>		<b>END of Course</b>

**Assignments are due 2400 hours (midnight) of the date that they are assigned.**

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