Mississippi Valley State University Mathematics, Computer & Information Sciences Itta Bena, Mississippi 38941

Course Syllabus

Course Number: CS 205Meeting Times: MWF 10:00 – 10:50 amTitle: Data StructuresCredit Hours: 3 Credit HoursCourse Instructor: Marcus GoldenCourse Coordinator: Timothy HolstonEmail: marcus.golden@mvsu.eduOffice: 134 CRB & Phone: 3401Office Hours: MW 11 – 12:00pm, MW 2 – 3:00pm, TR 10 – 12:00pm, TR 2:30 - 3:30pmWebsite: http://bluebird.mvsu.edu/Faculty/mgolden_profile.html

Catalog Description: Students will use UNIX to program structures such as lists, trees, graphs, queues, stacks and sorting techniques. **Course Prerequisites:** CS 204

Textbook(s) and other Required Materials:

M. Goodrich, R. Tamassia & D. Mount, Data Structures & Algorithms, 2nd ed., John Wiley & Sons, Inc., Hoboken, New Jersey, 2011. **ISBN 9780470383279**

Program Outcomes:

Student will be able to:

- 1.1 Demonstrate proficiency in the design of software.
- 1.2 Demonstrate proficiency in the implementation of software based on software design.
- 1.3 Analyze algorithms to determine the most efficient implementation
- 3.1 Use CS, MA and science principles and computing practices to analyze and solve a computer science problem.
- 3.2 Demonstrate an understanding of mathematics and natural science

Course Outcomes:

Students will be able to:

- 1. Write programs that use data structures such as linked lists, stacks, queues, and trees.
- 2. Choose the appropriate data structure to model a given problem and give cost and benefit analysis of static and dynamic structures
- 3. Identify the base and recursive case of a recursive problem.
- 4. Describe the divide and conquer approach to solving problems.
- 5. Implement recursive functions such as backtracking in a 2D Space.
- 6. Use algorithm analysis concepts to describe bounds on time and space complexity of algorithms.
- 7. Discuss graph algorithms and understand what is meant by shortest path and graph traversals.
- 8. Understand O (n log n) sorting algorithms such as heapsort and mergesort and $O(n^2)$ algorithms such as quicksort.

Course Outcomes Mapped to Program Outcomes												
CS 205 Data Structures												
Course	P0	PO										
Outcomes	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	4.1	4.2
1	X	Х	Х						Х	Х		

								-	
2	Х	Х	Х			Х	Х		
3	Х	Х	Х			Х	Х		
4	Х	Х	Х			Х			
5	Х	Х	Х			Х	Х		
6	Х	Х	Х			Х	Х		
7	Х	Х	Х			Х			
8	Х	Х	Х			Х			

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Prerequisite by Topic:

Arrays, Pointers, Object-Oriented Programming Concepts, Sorting Algorithms, Searching Algorithms, Analysis of Algorithm

Major Topics Covered in Course:

2 wks
1 ½ wks
2 wks
2 wks
1 wk
2 wks
2 wks
1 wk
½ wk
½ wk
½ wk

Laboratory Projects:

Students will be required to write programs that will touch all major topics covered in course, some of the laboratory projects will include multiple topics when topics can be combined.

Estimated CSAB Category Content						
	Core	Advanced				
Data Structures	2					
Algorithms	1					
Computer Organization &						
Architecture						
Concepts of Programming						
Languages						
Software Design						

Oral and Written Communications:

Student will be required to write small 1-2 page papers regarding topics/developments in computer science.

Social and Ethical Issues:

Theoretical Content:

Algorithm Design Object Oriented Design

Problem Analysis & Solution Design: Students will be given problem descriptions in which they have to come up with a correct design. They will also compare designs with known designs and determine most efficient.

Grading Scale:		Course Evaluation:	
90 - 100	А	Assignments	20%
80 - 89	В	Quizzes/Homework	25%
70 - 79	С	Exams	50%
60 - 69	D	Paper	5%
59 - below	F	-	

Homework/Lab Assignments: All assignments must be completed and handed in on time at the beginning of class. Make sure you following the format guidelines required for each assignment. I will not accept a partially completed assignment. Also, 10 points will be deducted for each class day that work is turned in late. After 3 days being late, work will not be accepted. Exceptional circumstances should be discussed with the instructor in advance.

Attendance Policy: Attendance is required. Please make every effort to arrive on time! After 5 minutes of the schedule start time of the class, the door will be shut and you will not be allow to enter, thus receiving an unexcused absent for that day. The class roll will be recorded/documented every class session. Sign the roll with you signature. Do not print and do not sign another student's name. I count the number of students every class period. For every 4 unexcused absents, you will receive a letter grade drop. In an event of an absent, you must provide valid documentation base on the university's requirements in order for the absent to not count against you. Students who wish to discontinue the class should officially drop the course; otherwise a grade of "F" will be recorded.

Student Code of Conduct/Civility: Full details may be obtained from the Student Handbook. At a minimum, I expect you to treat each other (and your instructor) politely and with respect. This includes turning off all cell phones (or muting them), participating in class, and arriving in a timely manner. Cell phones/iPods/multimedia devices are to remain in your bags or pockets and should not be visible at any time during the class/lecture/lab hours. No laptop use in the classroom during class hours unless instructed to use them. Please remember that personal conversations during lecture and lab time are distracting to your fellow students and instructor, thus they are not permitted. Collaboration on a project is an exception, of course.

Cheating, Plagiarism/Academic Integrity and Penalties

Any student who submits another student's work as their own will have committed the act of plagiarism. This includes programming assignments and papers. Cutting and pasting from another paper (from web) without giving proper credit to the author of the original paper will be considered plagiarism. Copying parts of another student's paper and programming assignments is also considered plagiarism. The student receives an automatic F on that paper/assignment if it is plagiarized. If the student commits the act of plagiarism a second time, then the student will receive an F grade for that class.

Student with Special Needs: Mississippi Valley State University is committed to providing reasonable accommodations for students with a documented disability. If you feel you are eligible to receive accommodations for a covered disability (medical, physical, psychiatric, learning, vision, hearing, etc.) and would like to request it for this course, you must be registered with the Services for Students with Disabilities (SSD) program administered by University College. It is recommended that you visit the Disabilities Office located inside the EMAP Computer Lab in the Technical Education (IT) Building to register for the program at the beginning of each semester.

For more information or to schedule an appointment, please contact Mr. Billy Benson, Jr. via phone or email at 662-254-3005 or <u>billy.benson@mvsu.edu</u>.

I reserve the right to make changes on this syllabus as needed. This document does not constitute a contract with the University. It contains guidelines.