COURSE TITLE: CSCI 4065, CRN 63630, Advanced Topics in Computer Science

I. CONTACT INFORMATION

Instructor:	Paul D. Wiedemeier, Ph.D.		
Telephone:	318-342-1856		
Email:	wiedemeier AT ulm DOT edu (preferred)		
Webpage:	https://sites.google.com/site/wiedemeierp/		
Office:	Hemphill Hall, Room 348		
Office Hours:	Mondays, Tuesdays, Wednesdays, & Thursdays 9:00 am – 9:30 am Tuesdays & Thursdays, 11:00 am – 1:00 pm Mondays & Wednesday, 12:30 pm – 2:30 pm Others by appointment		

II. COURSE DESCRIPTION

An introduction to the study of advanced topics in computer science, including parallel and distributed computing, formal languages and automata theory, and other current topics.

III. COURSE PREREQUISITES/COREQUISITES

CSCI 3005

IV. COURSE OBJECTIVES

• Computation Theory

- o Analyze the behavior of deterministic and nondeterministic finite automata
- Construct deterministic and nondeterministic finite automata to solve basic problems
- Transform a nondeterministic finite automaton to its deterministic equivalent
- o Analyze the behavior of standard Turing machines
- Construct Turing machines to solve basic problems
- o Discuss the impact of nondeterminism on Turing machine algorithms
- Measure the efficiency (time complexity) of standard and nondeterministic Turing Machines

• Internet Socket Programming

- Understand how the client-server model of Internet programming works.
- Understand how Internet programming tasks are accomplished.
- Build Internet tools that assist in automating data transfer over the net.
- Write software and develop interactive, client-side and server-side executable applications.

• Interprocess Communication

• Implement simple communication between processes.

• Parallel and Distributed Computing

- Distinguish using computational resources for a faster answer using a shared resource
- For a given program, distinguish between its sequential and parallel execution
- Identify opportunities to partition a serial program into independent parallel modules
- Write a correct and scalable parallel algorithm
- o Identify independent tasks in a program that may be parallelized
- Parallelize an algorithm by applying task-based decomposition
- o Determine the critical path with respect to a parallel execution diagram

V. COURSE TOPICS

• Computation Theory

- Deterministic and non-deterministic finite automata
- Deterministic and non-deterministic Turing machines
- Computational complexity and Turing machines

• Internet Socket Programming

- TCP Sockets (TELNET, HTTP, etc.)
- UDP Sockets (TFTP, DNS, etc.)
- Secure Socket (SSL, etc.)

• Interprocess Communication

• Process control including process creation, process termination, process execution, and interprocess communication.

• Parallel and Distributed Computing

• Parallel Algorithms

VI. INSTRUCTIONAL METHODS AND ACTIVITIES

Lectures, Class Discussion, and Problem Solving

All students <u>must</u> have access to ULM's Moodle system. A Moodle account is generated for all students once fees are paid. If you have problems accessing Moodle, then contact the ULM help desk.

VII. EVALUATION AND GRADE ASSIGNMENT

Exams: Three (3) examinations will be will be proctored during the semester. See Course Calendar below.

Assignments: Students will complete several assignments during the semester. All assignments are due before the specified time on the specified due date.

Students are expected to complete and turn in for a grade their own assignments. Similar assignments turned in for a grade by two or more students will be processed accordingly (see Academic Honesty). Assignments will be available for downloading from the course website. As most assignments require considerable time to complete, it is strongly suggested that students begin work on the assignment the day it is assigned.

In-Class Quizzes: Students may complete several in-class quizzes during the semester. An in-class quiz will test students' knowledge on assigned readings and videos. All in-class quizzes are due before the end of class.

In-Class Exercises: Students will complete several in-class exercises during the semester. All in-class exercises are due before the end of class.

Written Appeals: A student who believes the instructor has incorrectly graded an exam question or assignment may submit a written appeal. All appeals must be respectfully written and include the following information: the student's name and student number, the exam question or assignment being appealed, and the reason(s) why the student believes the exam question or homework assignment was incorrectly graded. The student must present a printed copy of the written appeal (stapled to the exam or assignment was returned to the class. The student will be informed of the instructor's decision shortly after the 1 week due date lapses.

Point Totals:

Evaluation	Points/Percent of Grade
First Examination	15%
Second Examination	15%
Third Examination	15%
Assignments, Quizzes, Exercises, etc.	55%
Total	100%

Grade Scale: 90%-100% = A; 80%-89% = B; 70%-79% = C; 60%-69% = D; Below 60% = F

Midterm grades will be posted on-line for students to view via Banner. A midterm grade indicates a student's progress at mid-semester only and does not indicate the final performance outcome of the student.

VIII. CLASS POLICIES AND PROCEDURES

All policies stated in the current ULM *Student Policy Manual & Organizational Handbook* should be followed (see http://www.ulm.edu/studentpolicy/).

Need for Assistance: If you have any condition, such as a physical or learning disability for which you need extra assistance, please see me immediately. If you have already met

with Special Services, please provide me with information regarding your special need as soon as possible so that appropriate accommodations can be made.

Additional class policies include:

A. Textbook(s) and Materials:

None assigned. See course web site.

B. Attendance Policy:

Attendance will be taken during each class meeting and recorded in the instructor's grade book. The class attendance regulations in ULM Student Policy Manual will be followed. The policy includes the following statements:

- Any student who is not present for at least 75% of the scheduled class sessions in any course may receive a grade of W if this condition occurs prior to the last day to drop a course or a grade of F after that date.
- Any University-related activity requiring an absence from class will count as an absence when determining if a student has attended 75% of class meetings.
- Students are responsible for the effect absences have on all forms of evaluating course performance. Thus, the student is responsible for arranging the allowed make up of any missed work.

C. Make-up Policy:

Makeup exams and quizzes, etc. will be only given for university approved excuses as defined in the *ULM Student Policy Manual*. See URL

http://www.ulm.edu/studentpolicy/. If you do not take an exam on the scheduled day, it is your responsibility to contact the instructor for a makeup exam and present a copy of your excuse to the instructor at the first class meeting in which you return to class. Makeup exams and quizzes are typically more rigorous than the regularly scheduled assessment. (E.g. essay questions rather than multiple choice questions).

D. Course Evaluation Policy:

At a minimum, students are expected to complete the online course evaluation. (Also, include any additional course-specific policies related to evaluation of the course.)

E. Student Services:

Information about ULM student services, such as Student Success Center (http://www.ulm.edu/cass/), Counseling Center (http://www.ulm.edu/counselingcenter/), Special Needs (http://www.ulm.edu/counselingcenter/special.htm), and Student Health Services, is available at the following Student Services web site *http://www.ulm.edu/studentaffairs/*.

F. Emergency Procedures:

Students are expected to become familiar with emergency exits nearest the room in which the class is held. Should an emergency arise, students should proceed cautiously to the nearest exist.

G. Discipline/Course Specific Policies:

This use of mobiles devices, pagers, CD players, radios, etc. is prohibited in the classroom. If you have your phone you must have it should be set to vibrate or turned off and should never be answered during class time. If you feel that it is an emergency you should leave the classroom quietly to respond to the call with the understanding that you will be held responsible for any material that you miss due to the absence from the classroom. All mobile devices must be turned off and out of sight during test periods with no exceptions.

H. Academic Integrity:

ULM expects students to fulfill their academic obligations through honest and independent efforts. In a community of scholars committed to truth, dishonesty violates the code of ethics by which we live and is considered a serious offense subject to strong disciplinary actions. Example violations are listed in the ULM catalog. If the instructor determines there was intentional unacceptable behavior, a student will receive negative points on the activity for a first offense of academic dishonesty. For a second offense of academic dishonesty, during the same class and semester, the student will be reported to the Academic Dean of the College of Business, the Dean of the student's College, the Vice President of Academic Affairs, and will receive a grade of "F" for the class.

Students must observe the ULM published policy on Academic Dishonesty. Plagiarism and cheating are serious offenses and may be punished by failure on exam, paper or project; failure in course; and/or expulsion from the university.

Student services:

The University of Louisiana at Monroe strives to serve students with special needs through compliance with Sections 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. These laws mandate that postsecondary institutions provide equal access to programs and services for students with disabilities without creating changes to the essential elements of the curriculum. While students with special needs are expected to meet our institution's academic standards, they are given the opportunity to fulfill learner outcomes in alternative ways. Examples of accommodations may include, but are not limited to, testing accommodations (oral testing, extended time for exams), interpreters, relocation of inaccessible classrooms, permission to audiotape lectures, note-taking assistance, and course substitutions.

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds, including federal loans and grants. Furthermore, Title IX prohibits sex discrimination to include sexual misconduct, sexual violence, sexual harassment and retaliation. If you encounter unlawful sexual harassment or gender-based discrimination, please contact Student Services at 318-342-5230 or to file a complaint, visit <u>www.ulm.edu/titleix</u>.

Information about ULM student services, such as

- Student Success Center: <u>http://www.ulm/edu.cass/</u>
- Counseling Center <u>http://www.ulm.edu/counselingcenter/</u>
- Special Needs at <u>http://www.ulm.edu/studentaffairs/</u>
- Library http://www.ulm.edu/library/referencedesk.html
- Computing Center Help Desk <u>http://www.ulm.edu/computingcenter/helpdesk</u>

Current college's policies on serving students with disabilities can be obtained at for the ULM website: <u>http://ulm.edu/counselingcenter/</u>

- If you need accommodation because of a known or suspected disability, you should contact the director for disabled student services at:
- Voice phone: 318-342-5220
- Fax: 318-342-5228
- Walk In: ULM Counseling Center, 1140 University Avenue (this building and room are handicapped accessible).

Mental Wellness on the ULM Campus

If you are having any emotional, behavioral, or social problems, and would like to talk with a caring, concerned professional please call one of the following numbers:

- The ULM Counseling Center 342-5220
- The Marriage and Family Therapy Clinic 342-9797
- The Community Counseling Center 342-1263

Remember that all services are offered free to students, and all are strictly confidential. If you have special needs that you believe your instructor needs to be made aware you should contact your instructor within the first two days of class.

IX. TENTATIVE COURSE SCHEDULE

A. Contact Information:

See Page 1.

B. Schedule:

The following is a tentative schedule of topics, readings, test date, etc. The instructor reserves the right to adjust the schedule as needed.

Course Calendar CSCI 4065 - Advanced Topics in Computer Science CRN 63630 2023 Spring Semester (231) Hemphill Hall, Room 308, Mondays & Wednesdays, 11:00 am - 12:15 pm							
	Paul	D. Wiedemeier, Ph.	D.				
The University of Louisiana at Monroe							
Computer Science & CIS Programs							
wiedemeier AT ulm DOT edu							
Week	Date	Event	Topic	Readings			
1	Monday, January 9, 2023	No Cla	ass - ULM University Da	av			
	Wednesday, January 11, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
	Friday, January 13, 2023	Last day to withdr	aw from course w/o aca	ademic record			
	Monday, January 16, 2023	No	Class - MLK Holiday				
2	Wednesday, January 18, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
	Monday, January 23, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
3	Wednesday, January 25, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
	Monday, January 30, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
4	Wednesday, February 1, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
_	Monday, February 6, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
5	Wednesday, February 8, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
	Monday, February 13, 2023	Lecture and/or ICE	Reg. Exp. & FSA	CE Ch 3			
6	Wednesday, February 15, 2023		First Examination				
	Monday, February 20, 2023	No Cla	ass - Mardi Gras Holida	av l			
7	Wednesday, February 22, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
-	Monday, February 27, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
8	Wednesday, March 1, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
_	Monday, March 6, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
9	Wednesday, March 8, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
40	Monday, March 13, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
10	Wednesday, March 15, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
	Monday, March 20, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
11	Wednesday, March 22, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
	Monday, March 27, 2023	Last day to wit	hdraw from course with	"W" grade			
12	Monday, March 27, 2023	Lecture and/or ICE	IPC	CT Ch 16 & 17			
	Wednesday, March 29, 2023	S	Second Examination				
10	Monday, April 3, 2023	Lecture and/or ICE	Parallel Programming	B Ch 5-7			
13	Wednesday, April 5, 2023	Lecture and/or ICE	Parallel Programming	B Ch 5-7			
14	Monday, April 10, 2023	No Class	- ULM Spring Break Ho	oliday			
	Wednesday, April 12, 2023	No Class	- ULM Spring Break Ho	oliday			
15	Monday, April 17, 2023	Lecture and/or ICE	Parallel Programming	B Ch 5-7			
15	Wednesday, April 19, 2023	Lecture and/or ICE	Parallel Programming	B Ch 5-7			
16	Monday, April 24, 2023	Lecture and/or ICE	Parallel Programming	B Ch 5-7			
10	Wednesday, April 26, 2023	Lecture and/or ICE	Parallel Programming	B Ch 5-7			
17	Monday, May 1, 2023	Lecture and/or ICE	Parallel Programming	B Ch 5-7			
17	Wednesday, May 3, 2023	No (Class - ULM Study Day				
18 Tuesday, May 9, 2023 Final Examination, 8:				i0 am			
CE - Foundations of Computation by Critchlow & Eck							
CT - Perl Cookbook by Christiansen & Torkington							
B - Introduction to Parallel Computing by Barney							
The inst	tructor reserves the right to adiust	the course calendar					