

**LeMoyne-Owen College**  
**Division of Computer Science**  
**Computer Algorithms, COSI 335**  
**Spring 2024**

<b>Instructor:</b>	Valerie Chu, Ph.D.
<b>Office Room:</b>	GOH 400D or Teams
<b>Office Phone:</b>	Teams Chat, (901) 435-1378 or (901) 568-4424(cell)
<b>Office Hours:</b>	MWF 11:00a.m.-1:00 p.m., Tues/Thurs 10:00 a.m. to 11:00 a.m., Tues/Thurs 1:45 p.m. to 2:45 p.m.
<b>Email Address:</b>	valerie_chu@loc.edu
<b>URL:</b>	<a href="https://www.loc-cs.org/~chu/">https://www.loc-cs.org/~chu/</a>

**Credit Hours:** Three  
**Prerequisites:** COSI330  
**Class Meeting:** MWF 9:00 AM - 9:50 AM

## Syllabus

**Texts:** Cormen, Leiserson, Rivest and Stein, *Introduction To Algorithms*, Fourth Edition, The MIT Press, 2022, ISBN 978-0-262-04630-5

### Course Description:

This course is an investigation of various algorithms, their properties, applications, and corresponding data structures.

### College Graduate Competencies:

The two college graduate competencies (CGC) that are directly addressed in Server Side Web Programming are:

1. Think creatively, critically, logically, and analytically using both quantitative and qualitative methods for problem solving.
2. Communicate effectively (listen, speak, read, and write) on formal and informal levels.
8. Maintain literacy for the understanding of the impact of science and technology on individuals, society, and environment.

### Major Area Competency Levels:

The college graduate competencies are developed specifically for this course through major area competency levels (MAC). By the end of this course, students should have attained proficiency in the following major area competencies:

1. Demonstration of critical and logical skills to solve problems using existing algorithms. (CGC#1).
2. Show the ability of describing all possible ways of solving problems using existing algorithms. (CGC#2).

3. Will be able to control a computer through the process of programming, which will include defining the problem, planning the solution, coding the program, and testing the program.  
(CGC#8)

**Course Objectives:**

The identified major area competencies focus on solving problems logically. Therefore, students are expected to show proficiency in the following:

- To learn how to design computer algorithms from existing algorithms.
- To analyze the efficiency and best of representative algorithms.
- To explain how to make a decision of choosing a best algorithm.
- To understand how computer algorithms apply to real life.

**Attendance Policy:** In accordance with college policy, classroom attendance is required. The following standard will be applied:

1. If unexcused absences total 15% of the regularly scheduled class meetings, the instructor has the authority to lower the final grade by one letter.
2. If unexcused absences total 20% of the regularly scheduled class meetings, the instructor has the authority to give a failing grade.
3. Five classes of tardiness—arrival to class five minutes after class has begun—will equal one unexcused absence.

**Technology Use:** LeMoyné-Owen College is committed to enhancing student learning with a variety of applicable technology. In this course, students will use or be exposed to HTML, CSS, and PHP software.

**Demeanor:** Suitable demeanor, posture and attire are required. For guidelines and the dress code, please refer to the 2011/2012 Student Handbook (8-9; 13).

**Classroom Policies and Procedures:**

The classroom learning experience provides opportunities for faculty and students to engage in interactive exchanges of course content. To facilitate this exchange, the following guidelines are provided:

1. Because each class session covers vital material and information, it is important that students arrive on time to each class session.
2. In order to enhance students' performance and confidence in acquiring the material, it is critical that students come to each class session prepared. This includes bringing to class required texts, supplemental materials, and assigned work, which is provided on the course outline.
3. To limit unnecessary distractions which would deter learning, cell phones, multi-media devices, and laptops are required to be turned off or on vibrate when class is in session, except by permission of the faculty.

Faculty reserves the right to apply penalties for noncompliance to either or all of the above guidelines.

**Assignments, Assessment and Submission Requirements:**

- Several quizzes, two mid-term tests and a final comprehensive examination will be given.
  - The first mid-term test is to demonstrate the ability of counting steps of a computer algorithm and applying master theorem for a recurrence of a program.
  - In addition to the above, the first mid-term test is also to demonstrate understanding of all different types of sorting algorithms and how Binary Search Trees work.
  - The second mid-term test is testing on how Re-Black Trees work, graph algorithms, greedy algorithms, dynamic programming and minimum spanning trees.
  - The final comprehensive exam covers the entire course.
  - There are **no make-up tests** except for a valid document from a doctor; however, a note from home is not acceptable.
- Homework will be assigned frequently for students to demonstrate understanding how to calculate the steps of an algorithm and how to implement an algorithm to a Java program. If it is a programming assignment, students have to send the source code via e-mail to the instructor. If it is a written assignment, a student can write in paper or type in computer to submit to the instructor. **Sending somebody else’s work** to the instructor will not be permitted. Duplicated homework as well as the original will be assigned a grade of "F". **Late assignments will receive penalties.**

**Policies Related to Students with Disabilities:**

If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please make an appointment with Jean Saulsberry, Director of Student Development, as soon as possible at (901) 435-1727. The Student Development Office is located in the Alma C. Hanson Student Center, Room 208.

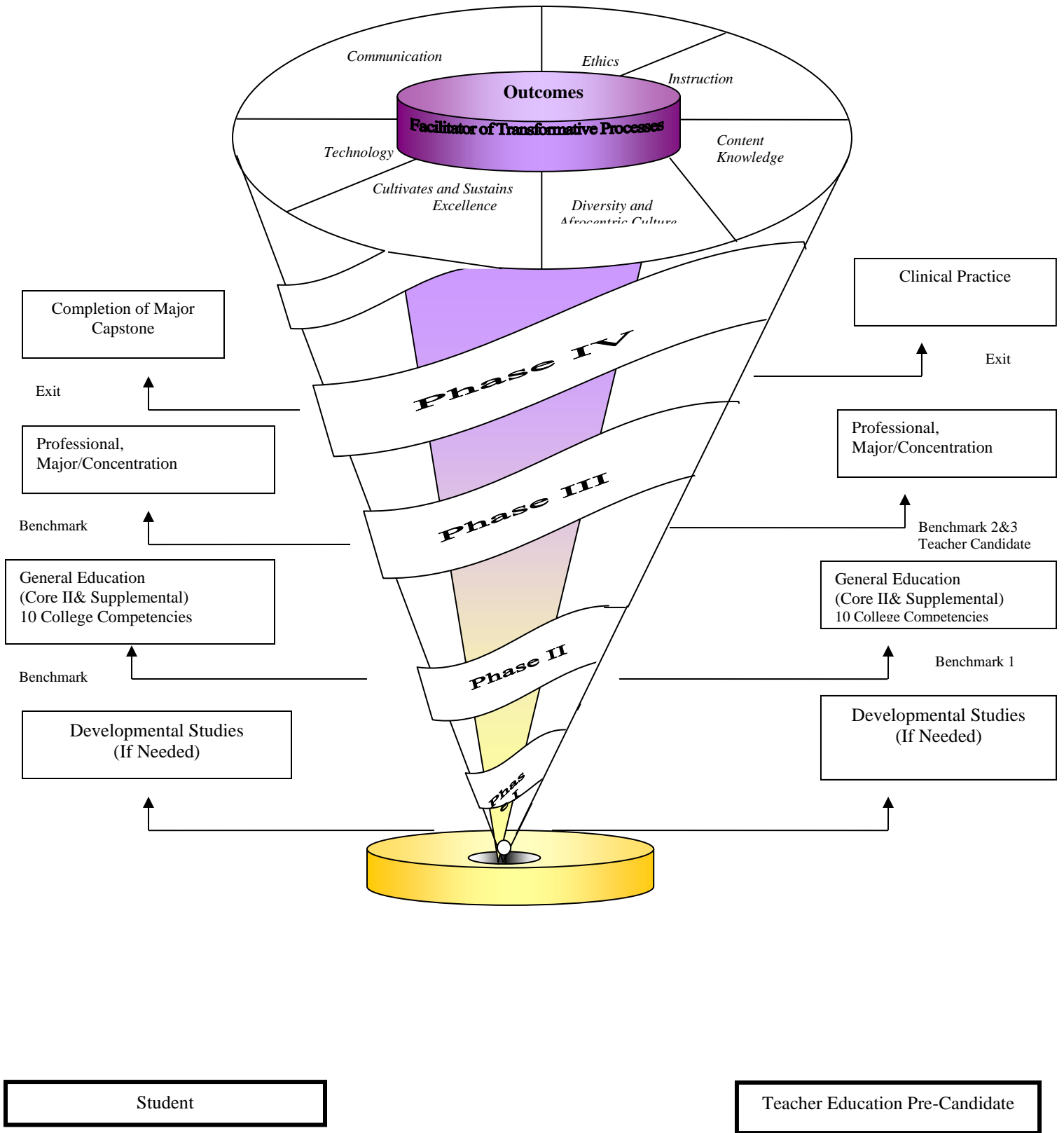
**Student Performance Evaluation and Grading Scale:**

<p>The course grade will be calculated on the following distribution:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">Assignments</td> <td style="padding: 5px; text-align: right;">20%</td> </tr> <tr> <td style="padding: 5px;">Quizzes</td> <td style="padding: 5px; text-align: right;">20%</td> </tr> <tr> <td style="padding: 5px;">Midterm Tests</td> <td style="padding: 5px; text-align: right;">40%</td> </tr> <tr> <td style="padding: 5px;">Final Comprehensive Exam</td> <td style="padding: 5px; text-align: right;">20%</td> </tr> </table> <p>The final exam score can replace the lowest midterm test score if student wish to.</p>	Assignments	20%	Quizzes	20%	Midterm Tests	40%	Final Comprehensive Exam	20%	<p>Grades will be recorded in numerical form until the final averages are determined at the end of the semester.</p> <p><i>Grading Scale</i> will be</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">90 to 100</td> <td style="padding: 5px;">A,</td> </tr> <tr> <td style="padding: 5px;">80 to 89</td> <td style="padding: 5px;">B,</td> </tr> <tr> <td style="padding: 5px;">70 to 79</td> <td style="padding: 5px;">C,</td> </tr> <tr> <td style="padding: 5px;">60 to 69</td> <td style="padding: 5px;">D,</td> </tr> <tr> <td style="padding: 5px;">others</td> <td style="padding: 5px;">F.</td> </tr> </table>	90 to 100	A,	80 to 89	B,	70 to 79	C,	60 to 69	D,	others	F.
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## LeMoyne-Owen College Graduate Competencies (CGC)

### **LeMoyne-Owen College graduates should be able to:**

1. Think creatively, critically, logically, and analytically using both quantitative and qualitative methods for problem solving;
2. Communicate effectively (listen, speak, read, and write) on formal and informal levels;
3. Distinguish, clarify, and refine personal values for the attainment of richer self-perception and relate those values to the value system of others;
4. Appreciate, understand, and know the foundations of the Afrocentric perspective;
5. Appreciate, understand, and know the foundations of diverse cultures in the context of a global community;
6. Appreciate, understand, now and pursue the principles, methods and subject matter that underlie the major discipline(s);
7. Accept social responsibility and provide service to humankind;
8. Maintain levels of literacy that allow them to understand the impact of science and technology on individuals, society, and the environment;
9. Attain motivational, personal management, interpersonal skills, professional development and research experience, as well as resourcefulness that will form the basis for a career and/or further educational experiences;
10. Attain critical skills, frame of reference, and understanding needed to appreciate and discriminate between artistic achievements.



**The Conceptual Framework Model**  
**Theme: Teacher as a Facilitator of Transformative Processes**

**COMPUTER ALGORITHMS**  
**Course Outline (tentative)**

<b>Weeks</b>	<b>Chapters</b>	<b>Topics</b>
<b>1</b>	1	The Role of Algorithms in Computing
	2	Getting Started (Insertion Sort & Merge Sort)
<b>2</b>	3	Growth of Functions (Asymptotic notation)
<b>3</b>	4	Divide-and-Conquer
<b>4</b>	6	Heapsort
<b>5</b>	7	Quicksort
	8	Sorting in Linear Time
<b>6</b>	10	Elementary Data Structures <ul style="list-style-type: none"> <li>• Stack</li> <li>• Queue</li> <li>• LinkedList</li> </ul>
<b>7</b>	12	Binary Search Trees
<b>8</b>	<b>Review &amp; Exam 1</b>	
<b>9</b>	13	Red-Black Trees
<b>10</b>	14	Dynamic Programming
<b>11</b>	15	Greedy Algorithms
<b>12</b>	20	Elementary Graph Algorithms
<b>13</b>	21	Minimum Spanning Trees
<b>14</b>	<b>Review &amp; Exam 2</b>	
<b>15</b>	<b>Final Comprehensive Exam</b>	

**Instructor reserves the right to add or subtract assignments or assessments.**