

1. CSC 176 Object-oriented Programming

Section 01

MWF 12:00 - 12:50 P.M. in RH 248.

2. Instructor

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Office Hours (RH 235)

MWF 9:00 - 10:00 AM

3. Course Description & Rationale

College Catalog Description

This course continues the study of program development introduced in CSC 175. Topics include intermediate program design, object oriented programming (objects, types, inheritance, and polymorphism), basic data structures such as arrays and strings, and event-driven programming using a graphical user interface (GUI). Students will use a high-level programming language to complete several intermediate sized programming projects to reinforce concepts.

Prerequisite

CSC 155, CSC 165 or CSC 175.

Rationale

This course introduces an object-oriented programming language and concepts. As such, it represents a foundational subject area within computer science. This course covers the following knowledge areas and topics in the latest computer science curriculum guidelines.

- Algorithms and Complexity (AL): Fundamental Data Structures.
- Information Assurance and Security (IAS): Defensive Programming, Foundational Concepts in Security, Principles of Secure Design, and Threats and Attacks.
- Programming Languages (PL): Basic Type Systems, Language Translation and Execution, and Object-oriented Programming.
- Software Development Fundamentals (SDF): Algorithms and Design, Development Methods, Fundamental Data Structures, and Fundamental Programming Concepts.
- Software Engineering (SE): Software Construction, Software Verification and Validation, and Computational Paradigms.

4. Course Materials & Resources

Textbook

- Liang, Y.D. (2009). *Introduction to Java Programming, Comprehensive Version, 10th Edition*. Pearson.
- Refer to this course in [Canvas](#) for information on when you should refer to chapters in the textbook.

Resources

- Other course materials will be available to students through the CSC 176 course in [Canvas](#).

5. Learning Goals and Objectives

Program Learning Goals

Le Moyne College expects its computer science graduates:

1. Use critical thinking skills, problem solving techniques, and abstraction to develop computational solutions while understanding how theory and practice influence each other and appreciating the value of good design.
2. Apply the knowledge they have learned to solve real world problems, realize that there are multiple solutions to a given problem and be able to assess the benefits and weaknesses of different approaches.
3. Be prepared for the rapid pace of advances in the computing field and for continued growth as a computing professional.
4. Be able to communicate their knowledge to others in an ethically responsible manner and be prepared to work individually or in a collaborative environment.

Course Learning Objectives

Upon completion of this course, the student shall be able to:

- Understand object oriented concepts (e.g. classes, objects, inheritance, and interfaces).
- Apply object oriented concepts to implement non-trivial programs in a high level language.
- Understand syntax and semantics of a high level programming language.
- Understand and apply algorithmic thinking.
- Understand and apply 3 design strategies (separation of concerns, design for reuse, design only what is needed).
- Use an advanced programming environment.
- Be able to design graphical user interfaces (GUIs).
- Understand and use basic data structures.
- Understand black-box and white-box testing techniques and develop tests of each type.
- Test and debug programs.
- Understand fundamental design principals including abstraction, program decomposition, encapsulation, and separation of behavior and implementation.
- Assess the strengths and weaknesses of different object oriented program designs.
- Use web-based resources to support learning.

6. Assessment and Evaluation of Learning

Assessment

A student actively participates in the assessment of their learning. Assessment activities include:

- Student discussions of course information in formal and informal settings.
- Reviewing instructor feedback to help gauge which learning activities are most helpful.
- Being honest with yourself about what your strengths and weaknesses are as it relates to learning the course materials.
- Being open to new ideas regarding the best way(s) for you to learn this material.

It will be important that you come to class prepared. This means that any reading assignment and/or learning exercise must be completed prior to the start of a class session.

Evaluation

The evaluation of a students' learning is done solely by the instructor. Your evaluation, which results in a grade, shall include the following elements:

Assignments & Quizzes	50%	Assignment and quiz grades are averaged for this portion of your final grade.
Exams	30%	Exams given during the semester, as described in the outline found below, are averaged for this portion of your final grade.
Final Exam	15%	The final exam shall be administered during final exams week, as described in the course outline below.
Participation	5%	This portion of your grade will be determined by taking attendance and by earning participation points on some assignments.

Please note that the grade computed in the Canvas gradebook will not be accurate. The Canvas gradebook will not use the above percentages to compute its final grade.

Final grades are rounded and assigned according to the following scale.

A (4.0): 93-100%		A- (3.7): 90-92%
B+ (3.3): 87-89%	B (3.0): 83-86%	B- (2.7): 80-82%
C+ (2.3): 77-79%	C (2.0): 73-76%	C- (1.7): 70-72%
D (1.0): 60-69%		
F (0.0): 0-59%		

How much time should I devote to this class?

- For every hour of class time, you will likely need to devote 2-3 hours of non-class time to this course.
- Since this is a three credit hour course, it is likely that you will be *spending 6-9 hours outside of class reading the textbook, thinking about and collaborating on course topics, and doing assignments.*

How should I read the textbook?

The textbook we are using is written in a terse/concise manner, much like a reference book. Because of this, you will not be assigned specific reading assignments. Instead, I will refer you to sections in the textbook where you will find descriptions associated with the concepts being covered in class. *The instructor recommends that you refer to these sections for another explanation of the topic should you need additional material to reinforce your learning.*

7. Course Procedures and Policies

Assignments

Each assignment has a due date and time (e.g., Tuesday, August 30, 2011 by end-of-day i.e., 11:59:59 PM). An assignment solution submitted after the due date/time shall have a late penalty applied to the grade.

Based on the following notation, the formula below explains the assignment late penalty policy.

- **DDT** the Due Date/Time.
- **SDT** the Submission Date/Time.
- **+n** the nth day after DDT.

Formula	Late Penalty
$DDT+n-1 < SDT \leq DDT+n$	-5n%

When $n=1$, the assignment is one day late and a 5% late penalty is applied. When $n=2$, the assignment is two days late and a 10% late penalty is applied. And so on. The maximum late penalty is 50%; any assignment submitted after ten days receives the maximum late penalty.

Any College announcement indicating that classes have been cancelled affects the above policy *only if* the day classes were cancelled is also the DDT. In this case see Error: Reference source not found (below) for details.

Attendance

Attendance is crucial. I would strongly suggest that you not miss any lecture or lab session.

You are responsible for any material covered during the session that you missed. As described under **Grading**, participation is ten percent of your final grade, and participation is based on attendance and some small group assignments.

Backups

You should use your H: drive to store all of the assignment files for this course. A benefit to doing this is that the Information Technology Office does a backup of your H: drive each evening. Should you accidentally delete an assignment file, the IT help desk can help you get that file back (assuming the file has existed for at least 24 hours).

Cancelled Classes

In the event that the college cancels classes, the following conditions apply:

- If an assignment is due, it will be due the next time the class meets, at the beginning of the class.
- If a quiz or exam was to be given, it will be given the next time the class meets.

E-mail Communication

When the instructor sends an e-mail out to the class, the instructor will use your Le Moyne e-mail address. Should you send an e-mail to the instructor; the instructor will reply using the e-mail address you used to send the e-mail.

When sending the instructor an e-mail using a non-Le Moyne e-mail address, please identify yourself by name. It is sometimes very difficult to determine who you are based on an e-mail address (e.g., catboo@yahoo.com).

Missing Exams

If you miss an exam, you must let the instructor know in advance, and you must have a valid excuse (e.g., illness, family crisis). The following guidelines shall be applied:

- In the event that you do not let the instructor know in advance, 10% will be deducted from your exam grade.
- The instructor will work with you to reschedule the exam.

Missing Quizzes

If you miss a quiz, you must let the instructor know in advance, and you must have a valid excuse (e.g., illness, family crisis). The following guidelines shall be applied:

- When you do not let the instructor know in advance, you shall receive a zero for the quiz grade.
- You must provide the instructor with a written note from a doctor, family member, etc. indicating the reason for your absence.
- If no written note is provided, you shall receive a zero for the quiz grade.
- When you have a valid excuse, the quiz will not be included in the calculation of your final grade.

Pandemic Preparedness

In the event that the outbreak of a virus that is widespread during the spring semester, the following academic initiatives will be undertaken.

- Courses will *not* be canceled; the College will *not* shutdown.
- Material will be presented via Canvas for those students that are unable to attend class.
- If the instructor becomes ill with a virus, then the instructor will post instructions via Canvas as to how the course shall proceed, and to indicate when he'll restart classroom-based instruction.

8. Course Outline

The following outline provides an approximate schedule for covering the course topics. Exam dates will be announced at least one week prior to the scheduled date.

Schedule	Topic	Textbook Chapters
Day 1	Course Introduction <ul style="list-style-type: none"> • Attendance, syllabus, pre-survey 	
Weeks 1-2	Comparison of Python and Java <ul style="list-style-type: none"> • BMI_1_Main_only (.py, .java) • BMI_2_Functions (.py, .java) • Review of Input Validation 	2 Elementary Programming 3 Selections 4 Mathematical Functions, Characters, and Strings 6 Methods 9 Objects and Classes 12 Exception Handling and Text I/O
Weeks 2-5	Comparison of Java Solutions <ul style="list-style-type: none"> • BMI_3_Functions • BMI_4_Main, BMI_4_Obj • BMI_5_Main, BMI_5_Obj, BMI_5 • Exam #1 (Mon, Feb 18) 	9 Objects and Classes
Weeks 5-9	More about Classes and Objects <ul style="list-style-type: none"> • OO relationships (BMI_6) • for & do-while statements • 1D arrays (extend BMI problem statement) • Spring break (Mar 11-15) • Recursion • Exam #2 (Mon, Apr 1) 	5 Loops 7 Single-dimensional Arrays 10 Object-Oriented Thinking 11 Inheritance and Polymorphism 13 Abstract Classes and Interfaces 18 Recursion
Weeks 10-12	Some more about Classes and Objects <ul style="list-style-type: none"> • 2D arrays • File input/output processing • Easter break (Apr 18-22) • More recursion • Exam #3 (Fri, Apr 26) 	8 Multidimensional Arrays 12 Exception Handling and Text I/O 17 Binary I/O 18 Recursion
Week 13	Review for final exam	
May 6	Last day of classes	
	Final Exam Thursday, May 9, 2019 9-11:30 AM	

9. Accommodations

SPECIAL NEEDS: If you have a disability and need accommodations, please meet with me within the first two weeks of the semester to review your accommodation sheet. You should meet with someone from the Office of Disability Support Services each semester to review your documentation. The Office is located in the Library (1st floor; 445-4118; dss@lemoyne.edu).

10. Observance of Religious Holidays

As provided by New York State Education Law, a student has the right to miss a class event because of his or her religious beliefs. Any student that wishes to apply this law must notify the instructor at least two weeks in advance of missing the class event.

11. Tutoring

Tutoring @ Le Moyne, located in the back of the library, on the first floor, is open M-Th 9am-9pm, F 9am-4pm, and Sun 3pm-9pm. Peer tutors are available for most subjects. To sign up, visit <https://lemoyne.mywconline.com/> to create an account and log in to select the current semester's schedule. If you need tutoring for a subject not listed, please email tutoring@lemoyne.edu. Tutoring is free for all students and is available from the second week of classes through the last day of classes.

12. Academic Standards

Students are expected to observe at all times the highest ethical standards as members of the academic community. Any form of dishonesty makes a student liable to severe sanctions, including expulsion from the College.

For details, see the "[Academic Standards](#)" section in the [Academic Information](#) area of the [College catalog](#) or in the [Community Standards](#) area of the [Student Handbook](#).

Cheating Versus Collaboration (Specific to Computer Science)

You are encouraged to discuss your ideas and approaches to assignments with your classmates, tutors, and the instructor. Any solution that you submit should be written by you, or by your group/team for group-based assignments. You are expected to fully understand everything submitted, even when submitting a group-based solution. (Exception for the Senior capstone course: you will need to understand enough of your group members' contributions to create an integrated solution; you are not responsible for understanding all of the details of your group members' contributions.) If asked to do so, the instructor expects that a student can explain any part of their solution that the instructor deems suspicious or confusing. This includes explaining any line of code or design feature. When a student is unable to explain their solution this will be deemed an occurrence of cheating. Letting others copy your work constitutes cheating and is subject to the same penalties described in section **6 Assessment & Evaluation of Learning**. Depending on the severity and frequency of cheating, cheating may result in a grade of zero on the assignment/quiz/exam, formal notification to the Dean, and/or an F in the course.

Motivation for Cheating Policy (Specific to Computer Science)

Below are some of the motivations for why the CS program has developed this cheating policy.

- Employers look to the CS degree as an indication that a student can write software. When a company interviews a freshly graduated candidate for a software developer position, and the company determines that the candidate cannot write code, the company will be cautious about other students from the same school. If the company found that more than one candidate was unqualified in the technical interview, this company will likely start screening out candidates from that school. Thus, students that graduate with a CS degree without learning the skills hurt everyone else at their school.
- The CS faculty believe that the most effective way of learning software design, implementation, testing and debugging is to *take a hands on approach by grappling with concepts and being actively involved in code writing, design and problem solving*. This learning style is described as **active play**, and involves *being creative by experimenting with various approaches to solving a problem*.

- Discussions are an important aspect of collaboration. This is true in both college and professional environments. The CS faculty *encourage you to discuss the structure and rationale of your solution with your peers*.
- Note that, many employers' policies encourage software code reuse. However, 99.9% of the time when a professional reuses code, the existing code requires modification as it either solves a slightly different problem or only a part of the new problem. Thus a professional would still need to (1) formulate an idea of how they want to solve their problem; (2) be able to understand the code they are copying; and (3) be able to change it only where needed. The ability to accurately, effectively, and efficiently reuse portions of existing code in a project is a skill learned through experience and active play. These skills are not built by copying parts of the solution of the same problem from other students.
- *In upper level CSC courses, programming is used to help **reinforce fundamental concepts**. Note that programming is a great example of **active play**, which involves *being creative by experimenting with various approaches to solving a problem*. The CS faculty expect that upper level students are able to apply their programming skills to help demonstrate the concepts being covered.*

13. Title IX

Students who believe they have been harassed, discriminated against, or involved in sexual violence should contact the Title IX Coordinator (315-445-4278) for information about campus resources and support services, including confidential counseling services.

Le Moyne faculty are concerned about the well-being and development of our students and we are available to discuss your concerns. As faculty, we are obligated to share information with the College's Title IX coordinator to help ensure that the student's safety and welfare is being addressed, consistent with the requirements of the law. These disclosures include, but are not limited to, reports of sexual assault, dating violence, domestic violence, and stalking.

Please refer to Le Moyne's Assault Resources webpage (<https://www.lemoyne.edu/Compliance/Sexual-Misconduct-Resources>) for contact information and further details.

14. Students with Personal Problems

Students who encounter personal problems of any kind, especially problems that might affect their academic performance, are encouraged to contact the Wellness Center for Health and Counseling (<https://www.lemoyne.edu/Student-Life/Student-Services/Wellness-Center>). The Center is located in Romero Hall; appointments may be arranged by phone at 445-4195. The Center provides both individual and group counseling on a strictly confidential basis. The professional staff is also available on an emergency basis.