

# Syllabus

## CSCE 121: Introduction to Program Design & Concepts

Fall 2019

### Instructor, Teaching Assistants, and Peer Teachers

#### Instructor

Michael R. Nowak

Graduate Assistant Lecturer

- **Email:** [m.n@tamu.edu](mailto:m.n@tamu.edu)
- **Office:** HRBB 322B
- **Phone:** +1 (979) 307-0023
- **Web:** <http://michaelrnowak.com>
- **Office Hours:**
  - Regularly scheduled office hours are posted on my website.
  - You can also [schedule an appointment at http://book.michaelrnowak.com](http://book.michaelrnowak.com).

#### Teaching Assistants

TA Information \*

\*You will have to be logged into eCampus for link to work once the course is available.

#### Peer Teachers

Peer Teacher Central

(<http://engineering.tamu.edu/cse/academics/peer-teachers/>)

### Meeting Times and Important Dates

#### Meeting Times

- Lecture
  - 525-528: TR 09:35 – 10:50 (ZACH-350)
- Lab
  - 525: TR 14:35 – 15:25 (ZACH-582)
  - 526: TR 15:55 – 16:45 (ZACH-582)
  - 527: TR 17:30 – 18:20 (ZACH-582)
  - 528: TR 18:40 – 19:30 (ZACH-582)

#### Important Dates

- First day of class: Tuesday, August 27
- Syllabus Acknowledgement: Tuesday, September 3
- Exam 1: Tuesday, October 1
- Exam 2: Thursday, October 24
- Exam 3: Tuesday, November 26
- Last day of class: Tuesday, December 3
- Final Exam (optional)
  - 525-528: 12:30 – 14:30 Friday, December 6

### Course Description and Prerequisites

Extend prior programming knowledge to create computer programs that solve problems; use the C++ language; apply computational thinking to enhance problem solving; analyze, design and implement computer programs; use basic and aggregate data types to develop functional and object oriented solutions; develop classes that use dynamic memory to eliminate memory leaks; learn error handling strategies to develop more secure and robust programs.

#### Pre-requisites

ENGR 102 or CSCE 110 or CSCE 111 or CSCE 206 or a programming course in high school or permission of the instructor.

### Learning Outcomes

Upon completion of the course students should be able to:

- Use C++ to develop programs.
- Analyze a problem, identify the important features and use that information to design and develop a small computer program or function that solves the problem. Articulate the rationale for various design and implementation decisions.
- Represent algorithm designs as pseudocode or other appropriate representations.
- Given an algorithm, write code that implements the algorithm.
- Write code that follows common practices for readable code.
- Document code so that others can easily understand and follow the code.
- Explain the following concepts and utilize them when developing computer programs.
  - Abstraction
  - Information Hiding
  - Object oriented decomposition
- List common data types used in computer programs.
- Describe how each data type is stored in memory and explain any resultant characteristics and limitations.
- Given a piece of information to represent a problem, explain the rationale for which data type best models the information and its use in a program.
- List some types of aggregate data types and describe when each is appropriate.
- Use aggregate data types.
- Explain basic control structures including sequence, selection, and iteration as well as calling functions.
- Describe a program's memory (e.g. stack and heap). Explain the process of adding and removing memory from the stack and heap.
- Use strategies that mitigate errors in programs.
- Use functions to implement abstraction and information hiding that avoid unintended side effects.
- Explain the concept of recursion and list examples that use it.
- Describe the characteristics of a recursive function that works.
- Write programs that use recursive functions.
- Describe the process of allocating and deallocating dynamic memory.
- Write programs that use dynamic memory and avoid memory leaks.
- Write programs that use sequential input/output including files.
- Write programs that use object oriented programming.
  - Write classes that exhibit information hiding and encapsulation with appropriate permissions for attributes and methods.
  - Write classes that mimic the behavior of basic data types through operator overloading.
- Write classes that use inheritance and polymorphism.

## Textbook and Resource Materials

### Required Textbook

CSCE 121: *Introduction to Program Design & Concepts C++* (Online Textbook)

- [zyBook \(http://learn.zybooks.com\)](http://learn.zybooks.com)
- Class Code: TAMUCSCE121Fall2019
- You are required to have access to your copy linked to this class with the code above. Part of your grade depends on the completion of activities in the zyBook.
- zyBooks has a refund policy. I've heard of refunds given as late as after Q-drops. So purchase ASAP. Even if you have to wait to purchase until after add/drop, you can sign up and get access to the first chapter for free!
- Note: You are required to know the information in "optional" sections in the first 12 chapters; however, any participation activities and challenge activities in these sections are optional.



### Recommended Textbooks

- *Programming Principles and Practice Using C++, Second Edition*, Bjarne Stroustrup, Pearson, 2014.
- *A Computer Science Tapestry, Second Edition*, Owen L. Astrachan, McGraw-Hill, 2000. (Free PDF)

## Required Computer

You must have your own computer for both lab and lecture.

- You will have to install software on it. We will provide links to software you can install for the course and procedures for setting things up.
- Your computer must be capable of running the software you install.
- Some labs do not have power outlets at the tables.
  - You are responsible for ensuring that your device can run without plugging it in during lab sessions.
  - If your computer fails to run since it did not have enough charge, you cannot fully participate.
- Laptop Checkout Program
  - You can check out a temporary laptop from ZACH 383 if you are enrolled in a CSCE class.

## Required Online Tools

[eCampus \(https://ecampus.tamu.edu\)](https://ecampus.tamu.edu)

Dashboard for class content and materials.

[Piazza \(https://piazza.com/class/jxwonx41vz74i6\)](https://piazza.com/class/jxwonx41vz74i6)

Question and answer board for the course. Questions regarding homework and labwork should be directed here. Do not email these questions to instructors. Any posts that should be viewable by all students will be converted to visible for the entire class.

If you need to post code for any questions for homework, make it a post visible only to instructors.

[Mimir \(https://class.mimir.io/cas\\_login/5315e0bf-a5bc-4521-baec-923474543dd5\)](https://class.mimir.io/cas_login/5315e0bf-a5bc-4521-baec-923474543dd5)

Online code submission system with auto grading.

- [TAMU Mimir login \(https://class.mimir.io/cas\\_login/5315e0bf-a5bc-4521-baec-923474543dd5\)](https://class.mimir.io/cas_login/5315e0bf-a5bc-4521-baec-923474543dd5)
- Class access code: 27d3e12ae9

[Gradescope \(https://www.gradescope.com/\)](https://www.gradescope.com/)

Used to grade exams and return midterm exams to you. This system provides a better grading system for instructors and TAs. We will create accounts for you before you need to access it. You will receive email instructions from Gradescope on connecting.

[TAMU Google Team Drive \(https://google.tamu.edu/\)](https://google.tamu.edu/)

Used to share some course materials such as homework and labwork prompts. You must be logged into your TAMU Google account to access these materials. When submitting a Google form (e.g. for a quiz), your TAMU Google account will have to be the default account in your browser, or you can open an incognito window and log in from there.

## Americans with Disabilities Act (ADA) Policy Statement

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 believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, [visit the Disability Services website \(http://disability.tamu.edu\)](http://disability.tamu.edu).

If you find that course content, software, or websites are not accessible, please contact your course instructor or disability services so that appropriate accommodations to the learning environment can be made.

## Grading

% total	>=90	80-89	70-79	60-69	<60
Letter Grade	A	B	C	D	F

If you want to challenge any grading, you must do so within one week of when the grade is published.

We reserve the right to audit the grades for any assignments submitted to this course. During the audit process, we can decrease or increase your score. This could result in lowering the score of already released grades.

### EXAMS

50%

Course exam average is the average of Exam 1, Exam 2, and Exam 3.

- If you take the optional final exam, the course exam average becomes the maximum of
  - Final Exam grade
  - Average of Exam 1, Exam 2, Exam 3 and Final Exam.
- You must inform us that you want to take the optional final exam, and we will share the sign-up process later.

Exams are closed book, closed note, and no electronic devices are allowed including phones and smartwatches.

See late work policy.

### ZYBOOK ACTIVITIES

7%

Participation Activities (4%) + Challenge Activities (3%)

- Assignments are visible in the zyBook under the “Assignments” tab.
- For full credit, you must perfectly complete 85% of the activities by their due date.
- These are hard due dates and you cannot receive credit for late completion. Requiring the 85% threshold for full credit on any assignment allows omissions for extenuating circumstances including excused absences.

### HOMEWORK

35%

Homework assignments are completed individually outside of class and submitted weekly.

- You must write up your individual homework independently.
- All detected plagiarism will be reported to the Honor System Office.
  - Students have previously used code from Chegg; using such resources is not allowed.
  - If you submit code based on a solution or on starting code from such a resource is considered plagiarism. See plagiarism section below.

See late work policy.

### LABWORK

8%

Labworks are activities to be completed during lab time to provide a collaborative environment to discuss/work through some material that illustrates core concepts or common pitfalls.

- Students may work collaboratively.
- You must be present in the first lab each week to receive credit. The second lab should be used as a help session.

See late work policy.

### MODIFIERS

- **Lecture Attendance**
  - 70% attendance required (adjusted for excused absences). Attendance below that level will result in a one letter grade deduction.
- **Homework**
  - If you fail to submit a solution for more than 2 homework assignments, you will receive an F.
- **Exam Average Minimum**
  - If you have less than a 60% course exam average, the maximum grade you can receive is a D.
- **Syllabus Acknowledgement**
  - If you fail to submit the syllabus acknowledgement form by Tuesday, September 3 you will receive an F.

## Make Up & Late Work

Please review [Texas A&M student rule 7 \(http://student-rules.tamu.edu/rule07\)](http://student-rules.tamu.edu/rule07).

It is *your* responsibility to keep up with the class, even when unexpected events interfere.

### Excused Absences

Before you can do any make up work, you must email all documentation to your instructor.

### Labwork Late Work

You should always complete labwork even if you miss the first lab session of the week. If you have an excused absence, then you must visit a TA during office hours to discuss your labwork solution and receive credit for it.

### Homework Late Work

You may submit homework assignments up to 3 days late with a 12% penalty per day. If you have excused absences for 3 or more days for a given assignment, the late penalty is waived. Extenuating circumstances will be resolved by your instructor.

Note: Network congestion frequently increases close to deadlines. Consequently, waiting to submit until the last minute can easily lead it to become a late submission. We suggest finishing each assignment hours in advance to ensure it is on time. You should also submit periodically as you develop your solution to get feedback from the auto-grading system.

### Exam Make Up

You may only make up exams missed due to a university excused absence. Note that if advanced notice is not feasible, you have two business days to provide the notification. See Texas A&M student rules. A zero will be assigned for exams due to an unexcused absence. Documentation must be submitted before making up a missed exam.

If you miss an exam due to an excused absence you must take the makeup exam on the designated date and time:

- Exam 1: Friday, October 4 at 7:00 PM
- Exam 2: Friday, November 1 at 7:00 PM
- Exam 3: Monday, December 2 at 7:00 PM
  - Only if you have a course time conflict, you can make arrangements with your instructor.

## Student Behavior & Academic Integrity

*“An Aggie does not lie, cheat, or steal, nor tolerate those who do.”*

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

It is assumed that college students know what is honest and what is not.

### Aggie Honor System Office

You should be familiar with the [Aggie Honor System Office \(http://aggiehonor.tamu.edu/\)](http://aggiehonor.tamu.edu/). Their website provides more information on academic integrity, plagiarism, etc.

- [Definitions of academic misconduct, including plagiarism \(http://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules#Definitions\)](http://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules#Definitions)
- [Potential sanctions \(http://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Sanctions\)](http://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Sanctions)

### Acknowledgement

By submitting anything to this course, electronically or otherwise, you are asserting the following: “On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work. In particular, I certify that I have listed above all the sources that I consulted regarding this assignment, and that I have not received or given any assistance that is contrary to the letter or the spirit of the collaboration guidelines for this assignment.”

## Student Rules

Each student has the responsibility to be fully acquainted with and to comply with the Texas A&M University Student Rules (<http://student-rules.tamu.edu/>). More specific rules, information and procedures may be found in various publications pertaining to each particular service or department.

## Academic Dishonesty

Academic dishonesty will not be tolerated. For individual homework assignments, each student is expected to write his or her programs from beginning to end.

If it is determined to the satisfaction of the instructor that any student's submission (unless it is a group/team submission for a group/team activity) is not the product of the individual, all students involved are subject to the Texas A&M University Honor System Rules, including a course grade of F\* (with the "\*" denoting academic dishonesty). Additional penalties as determined by the Aggie Honor System Office may be applied if this is not the first offense.

It is imperative that each student clearly understand those rules and the severe consequences that can result from the adjudication of an Honor Code Violation.

### Plagiarism

Individual programming **MUST** be done on your own. Plagiarism will not be tolerated. Plagiarism is the presentation of the work of someone else without giving him or her due credit. In this course, **you cannot use another's work** even if you cite it.

To help identify possible instances of plagiarism, we use systems for plagiarism detection. Students engaging in plagiarism will be sanctioned. A typical result is an F in the course and submission of the incident to the Aggie Honor System.

### Complicity

Every student should understand that complicity – helping or attempting to help another student commit an act of academic dishonesty – also constitutes academic dishonesty and carries the same punishment as cheating including plagiarism.

In other words, if you provide your solution to another student, even if that student does not turn it in for credit, you have committed an act of academic dishonesty. All involved will be subject to the same consequences, such as a course grade of F\*.

## Collaboration

Collaboration is important for facilitating learning, and your peers can be a great resource. In this class, you can only collaborate on labworks and in-class activities. All other assignments and exams must be done independently. If you have an issue that needs clarification, contact an instructor or TA.

## Netiquette

Netiquette is network etiquette. Netiquette covers both common courtesies online and the informal when communication occurs online. Faculty and students are expected to follow some general netiquette rules (<https://distance.tamu.edu/Student-Rules-and-Policies/Aggie-Honor-Code-and-Netiquette>).

## Course Copyright

The materials used within this course are copyrighted. These materials include, but are not limited to, the syllabi, quizzes, exams, homework and labwork problems, online handouts, course videos, audio and visual recordings of classes, etc. Because these materials are copyrighted, you do not have the right to copy or distribute these materials, unless permission is expressly granted.

## Recording statement

Students may not record audio or video of any course activity unless the student has an approved accommodation from Disability Services permitting the recording of lectures and/or laboratory sessions. This accommodation letter must be presented to the instructor in advance of any recording being done. Students who are allowed to record classes are not permitted to redistribute audio or video recordings of statements or comments from the course to other individuals without the express permission of the faculty member and of any students who are recorded.

## Course Plagiarism

All materials generated by the instructor for this class (which may include but are not limited to syllabi and in-class materials) are copyrighted. You do not have the right to copy such materials unless the instructor expressly grants permission. As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writing, etc. which belong to another. Plagiarism is one of the worst academic violations, for the plagiarist destroys trust among others. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

## Tentative Schedule

Week	Topics
1	New forms of what you already know: writing a basic C++ program, selection (if, if/else), iteration (for and while loops), variables, simple input/output, simple functions
2	Problem solving process and design, debugging
3	File input/output, data type structure and limitations
4	Compound data types, additional selection (switch) and iteration (do/while loop), pointers and arrays, linear search
5	2d arrays, Intro to object-oriented concepts (encapsulation, inheritance, and polymorphism)
6	<b>Exam 1</b> , use of dynamic memory (i.e. heap) and memory management, shallow and deep copy
7	Expansion on functions, overloading, pass by value and pass by reference, binary search
8	Recursion, binary search (recursive), function templates
9	Object-oriented class design, <b>Exam 2</b>
10	Implementing user defined classes, access modifiers, constructors, operator overloading, class templates
11	Challenges of using dynamic memory in classes: shallow and deep copy, memory leaks
12	More experience with classes and dynamic memory: linked lists
13	Object-oriented inheritance and polymorphism
14	<b>Exam 3</b> , Thanksgiving holiday
15	Final exam review