



Course Syllabus
AP Computer Science A – Data Structures – CMP4502
Spring 2022
(Dual Credit BSU CS121)

Instructor: Ms. Susie Cunningham
Email: scunningham@bsu.edu
Office: Elliott 007
Classrooms: BU215 & BU219

Office Hours:

Mondays: Noon – 1:00 p.m. (in Elliott 007)
4:00 – 5:00 p.m. (BU215)
7:00 p.m. – 9:00 p.m. (Via Zoom)

Tuesdays: Noon – 1:00 p.m. (in Elliott 007)
3:00 – 4:00 p.m. (in BU215)

Wednesdays: Noon – 1:00 p.m. (in Elliott 007)
4:00 – 5:00 p.m. (BU215)

Fridays: Noon – 2:00 p.m. (in Elliott 007)
4:00 – 5:00 p.m. (BU215)

Other times for Office Hours may be arranged by appointment.
Can also email me at any time.

Description:

The **Computer Science Data Structures – CMP4601** course is an introduction to a high level, structured programming language and will entail syntax, grammar and its popular usage in the development of algorithms and data structures. Advanced placement topics will include **linked lists, stacks, queues, binary trees, sequential and binary searching, recursion, sorting algorithms, insertion, deletion, and traversal operations, hashing, heapsort, interfaces, sets (HashSet and TreeSet), maps (HashMap and TreeMap), binary files and file organization, data structures, internal and external storage, and system analysis methods.**

Text:

JAVA Software Solutions for AP Computer Science, Lewis, Loftus, and Cocking, Addison Wesley, 2004.

JAVA Concepts, Horstmann, Wiley, 2005.

Barron's How to Prepare for the AP Computer Science Advanced Placement Examination Java Version, Teukolsky, Barron's Educational Series, Inc., 2003.

Course Methodology:

Course methodology will include **hands-on activities, lectures, outside readings, classroom discussion, and projects.**

Student Evaluation:

There will be **2 tests (in written style), 7 homework assignments, and 1 major programming project.**

Method of Grading:

Grades will be based on a point system.

	<u>Points</u>
Tests 1 – 2	200
Final Project	100
Homework Assignments	<u>70</u>
Total Points	370

Accumulated totals are then distributed into letter grades as follows:

A	(93% - 100%)
A-	(90% - 92.9%)
B+	(87% - 89.9%)
B	(84% - 86.9%)
B-	(80% - 83.9%)
C+	(77% - 79.9%)
C	(73% - 76.9%)
C-	(70% - 72.9%)
D*	(69% and below)

Classroom Policies:

Homework Assignments: Homework assignments must be **turned in by the due date**. Assignments may be turned in earlier than the due date. **Any late homework will result in a reduced grade. (25% off for each day late.) Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday all count as days. A timeframe for a day constitutes from 12:01 a.m. – Midnight.**

Absence prior to due Date: Missing class (excused or not) prior to a test, or other due dates for homework assignments does not exempt the student from preparing and taking the test and/or submitting the required homework assignment on the due date. Exceptions may be granted in advance of class time and must be discussed with the instructor.

Tardiness: Students arriving more than 5 minutes late to class are marked tardy. Students arriving 20+ minutes late will be marked absent. **A student sleeping in class will be counted as an absence.**

Academic Dishonesty: (Refer to the Indiana Academy Handbook.)

In the event, a student turns in a computer program for a homework assignment or test that was not originally written by the student, the homework or test will fall under the category of plagiarism. This will be considered a **serious offense**. Students will be allowed to ask for help from other students if they are working on a preannounce group project or the student needs assistance finding a syntax error or minor errors.

If a student does use code in a programming homework assignment or project that was obtained from the Internet, another programming source, or writing code that is similar in nature, the student **must put in a comment in the computer program with the source of where the code was obtained, otherwise this will be considered under the category of plagiarism.**

Furthermore, if a student writes a computer program for another student, the student “knowingly permitting one’s work to be submitted by another person as if it were the submitter’s original work” will also be penalized.

Penalties will be assessed in accordance to the Indiana Academy Handbook.

Communication:

The best way to communicate with me is through email at scunningham@bsu.edu. My phone dings when I receive an email and I can answer back via email through my phone. Generally, I do answer back almost immediately during work hours (unless I am teaching a course or on my way to class). I will always respond back

within 24 hours. (This does include the weekends.) Generally, I am more available late at night. Office hours will be posted

Diversity and Inclusion:

Ball State University aspires to be a university that attracts and retains a diverse faculty, staff, and student body. We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse as expressed in our Beneficence Pledge and through university resources found at <http://cms.bsu.edu/campuslife/multiculturalcenter>.

Accommodations:

If you need course adaptations or accommodations because of a disability, please contact me as soon as possible. Ball State's Disability Services office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or dsd@bsu.edu.

Canvas Accessibility:

Canvas provides a user experience that is easy, simple, and intuitive. Special attention has been paid to making Canvas screen-readable. The Rich Content Editor encourages users to create accessible content pages (i.e. text formatting is accomplished using styles). Canvas is designed to allow limited customization of colors and schemes to be accessible for all users. The National Federation of the Blind granted Canvas the Gold Level Web Certification in 2010.

Find more information by visiting the Canvas Voluntary Product Accessibility Template (VPAT) .
<https://community.canvaslms.com/t5/Accessibility/Accessibility-within-Canvas/ba-p/261501>

Indiana Academy Mask Policy:

The Indiana Academy will follow [Ball State University's mask policy](#) (see Section IV). Based on current CDC guidance recommending the wearing of face masks for all people—regardless of vaccination status—in public indoor settings in communities where the rate of coronavirus transmission is high or substantial, all employees, students, and campus visitors are required to wear a mask while inside any University building. This requirement is effective on August 9, 2022. Fully vaccinated people are not required to wear masks outdoors.

Individuals who are not fully vaccinated for COVID-19 are required to wear face masks while inside campus buildings and outside when physical distancing cannot be maintained.

If a student declines to wear a face mask as required, the student will be referred to the Director of Academic Affairs or the Director of Residential Affairs. If the situation occurs in a classroom or other academic setting, it is considered a classroom management issue, and the teacher will remind the student of the requirement and give the student a chance to comply with it prior to referring the matter to the Director of Academic Affairs or the Director of Residential Affairs. Wearing masks is crucial to preventing the spread of COVID-19 to others.

Class Participation: Unless instructed otherwise, students need to be working on items relating to the classroom homework/topic during the class time.

Indiana Academy Unexcused Absence Policy

It is the policy of the Indiana Academy that any absence from class is unexcused, except for illness, death in the family, college or school-related activities, and extenuating circumstances. When a student is absent from a class, the instructor reports the student absence to the Faculty Attendance Coordinator in the Office of Academic Affairs. Unless the absence is excused by a school official, it is considered unexcused. The decision as to whether an absence is excused is not determined by the instructor.

The student is expected to attend every class. The student is allowed one unexcused absence without penalty. Each additional unexcused absence will be penalized as follows: Unexcused absence (1) = 1-point subtraction from final grade. Unexcused absence (2) = 3-point subtraction from final grade. Unexcused absence (3) = 5-point subtraction from final grade. (For example, if you have an 89 final average with (3) unexcused absences your final grade will be 84). Four (4) or more unexcused absences will lead to academic and residential consequences beyond the scope of this class determined by the Office of Academic Affairs (i.e., residential groundings, parent/principal conference, and/or detention).

Any minor assignment/test/project/presentation missed due to an unexcused absence will be handled according to the late work policy of this class. A student will be given an opportunity to retake any missed assignment/test/project/presentation worth more than 20% of the final grade but will be docked a full letter grade as a result.

Tentative Class Activity and Assignment Data Structures – CS 121

Class will be on Mondays, Tuesdays (Lab Days), Wednesdays and Fridays

Week of January 3, 2022:

The topic of dynamically linked lists will be introduced.

**Complete reading assignment: Chapter #9 – Blue Book
Chapters #9 – Barron's**

Week of January 10, 2022:

HW #1 (15 pts.) will be due on January 14, 2022. (Creating a Linked List using pointers.)

Complete reading assignment: Chapter #10 – Barron's

Week of January 17, 2022:

No classes on Martin Luther King Day.

The topic of sorting and recursion will be reviewed.

HW #2 (5 pts.) will be due on January 19, 2022. (Take HW #2 and rewrite program using Linked List class.)

HW #3(10 pts.) will be due on January 21, 2022. (Sorting and recursion)

Complete reading assignment: Chapter #7 & #8 – Barron's

Week of January 24, 2022:

The topics of stacks, and queues will be introduced.

HW #4(10 pts.) will be due on January 28, 2022. (Stacks and Queues)

Part A: Using Stacks

Part B: Using Queues

Complete reading assignment: Chapter #11 & 12 – Barron's

Week of January 31, 2022:

The topic of trees and binary searching will be introduced.

HW #5 (10 pts.) will be due on February 4, 2022. (Binary Tree)

Week of February 7, 2022:

Extended Weekend begins. (No classes on Monday.)

Review of the class material will be made.

February 9, 2022- Test #1 (50 pts.) – Multiple Choice

February 11, 2022 – Test #1 (50 pts.) – Free Response Programming Part

Week of February 14, 2022:

The topics of Big O notation, sets, maps, and heap data structures and algorithms will be introduced.

HW #6 (10 pts.) will be due on February 21, 2022. (Card Game using maps and sets)

Complete reading assignment: Chapter #13 – Barron's

Weeks of February 21, 2022:

Hashtables will be introduced. Students will discuss and program different hash algorithms.

HW #7 (10 pts.) will be due on February 28, 2022. (Hashing)

Week of February 28, 2022:

A review of the class material will be made.

March 2, 2022 – Test #2 (50 pts.) Free Response Programming Part

March 4, 2022 - Test #2 (50 pts.) Multiple Choice

March 7, 2022:

SPRING BREAK!!

Weeks of March 14, March 21, March 28, April 4, and April 18th, 2022:

Students will complete work on the major programming project and studying for the big AP exam.

[Extended weekend is on April 15th-18th.]

Week of April 25, 2022:

Major Programming Project (100 pts.) will be due on April 25 2022! Students will present their major programming projects to the class. During this week, the students will be able to utilize the other students' major projects.

Week of May 2, 2022:

Students will review for AP exam with practice exam questions.

May 4th is AP Computer Science A test!